URS

DOCKET	
09-AFC-1	
DATE	JAN 17 2011
RECD.	JAN 17 2011

January 17, 2011

Dockets Unit
California Energy Commission
1516 Ninth Street, MS 4
Sacramento, CA 95814-5512

Re: Watson Cogeneration Steam and Electric Reliability Project
Application for Certification 09-AFC-1

On behalf of Watson Cogeneration Company, the applicant for the above-referenced Watson Cogeneration Steam and Electric Reliability Project, we are pleased to submit the following:

- Comments on the Preliminary Staff Assessment.

This document is being submitted to the CEC for docketing.

Sincerely,
URS Corporation

C Kyle-Fischer

Cindy Kyle-Fischer
Project Manager

Enclosure

cc: Proof of Service List

URS Corporation
8181 East Tufts Avenue
Denver, CO 80237
Tel: 303.694.2770
Fax: 303.694.3946

Comments on the PRELIMINARY STAFF ASSESSMENT: Comments Table

APPLICATION FOR CERTIFICATION (09-AFC-1)

for Watson Cogeneration Steam and Electric Reliability Project

Submitted to:
California Energy Commission
1516 9th Street , MS 15
Sacramento, CA 95814-5504

Submitted by:
Watson Cogeneration Company
22850 South Wilmington Avenue
Carson, CA 90745

With support from:
URS Corporation
8181 East Tufts Avenue
Denver, CO 80237

January 2011

APPLICANT COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT for the WATSON COGENERATION STEAM AND ELECTRIC RELIABILITY PROJECT

This submittal provides Watson Cogeneration Company's (Watson's or the Applicant's) comments on the Preliminary Staff Assessment (PSA) issued by the California Energy Commission (CEC) on December 17, 2010, for the Watson Cogeneration Steam and Electric Reliability Project.

1. **PSA Text:** Watson has provided edits directly to the PSA text. Deletions are shown in red strikethrough and additions are shown in red underlining. The changes are cross-referenced with the PSA Comments Table, which provides an explanation or justification for the edits to the PSA.

2. **PSA Comments Table:** This table provides an explanation or further background on the Applicant's comments, edits, clarifications, and/or corrections to specific PSA text. It is organized consistent with the sections of the PSA and provides cross-referencing to the PSA text.

The following technical areas in the PSA are addressed in this submittal:

Section 3 Project Description
Section 4 Environmental Assessment
- Section 4.1 Air Quality
- Section 4.2 Biological Resources
- Section 4.3 Cultural Resources
- Section 4.4 Hazardous Materials Management (PSA Comments Table only; no text edits)
- Section 4.9 Soil and Water Resources
- Section 4.10 Traffic and Transportation
- Section 4.12 Visual Resources
- Section 4.13 Waste Management

Section 5 Engineering Assessment
- Section 5.1 Facility Design
- Section 5.2 Geology and Paleontology
- Section 5.4 Power Plant Reliability

Comments on the Preliminary Staff Assessment
Watson Cogeneration Steam and Electric Reliability Project
PSA Dated December 17, 2010

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Global (Applies Throughout the PSA)				
G.1	Global	Global		Please reconcile the reference citations within the text against the reference lists at the end of each PSA section.
G.2	Global	Global		The Watson Cogeneration Steam and Electric Reliability Project (referred to in the PSA as the BP Watson Project, or the Project) does not include any off-site linear facilities. Please delete all references to off-site linear facilities in the PSA, particularly in the Conditions of Certification.
Section 3	**Project Description**			
3.1	3	3-2	Air emissions from the combustion of natural gas will be controlled using state of the art systems. Emissions CO and ROG will be reduced with the use of a CO catalyst system and a selective catalytic reduction (SCR) system that will use aqueous ammonia to control NOx emissions. ~~assist in the reduction process.~~ Emissions of particulate matter and SOx will be limited through the use of gaseous fuels. A Continuous Emissions Monitoring system will be installed to monitor emissions from the exhaust stacks.	Text has been edited for clarification. Refer to edited PSA text.

[1] Page number from the PDF of the PSA.
[2] Text from PSA that is the subject of the Applicant's comment.
[3] Applicant's comment.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 4.1	**Air Quality**			
4.1.1	4.1	4.1-20	...These controls would include DLN combustors in the CTG to limit nitrogen oxide (NOx) production, Selective Catalytic Reduction (SCR) with ~~anhydrous~~ aqueous ammonia for... ...Since the BP Watson facility already has four identical units operating with SCR and using ~~aqueous~~ the more-concentrated anhydrous ammonia, the addition of a fifth unit using SCR with 30% aqueous ammonia would not result in the introduction of new hazards associated with SCR and aqueous ammonia and would simplify integration of the fifth unit into the existing operations.	The existing Watson Cogeneration facility uses anhydrous ammonia. The Project was originally designed to also use anhydrous ammonia, as described in the Application for Certification (AFC). However, after the AFC and the air permit application were filed in 2009, South Coast Air Quality Management District (SCAQMD) requested that the Project change to aqueous ammonia. This request pertained only to the Project, not the existing Watson Cogeneration facility. Refer to edited PSA text.
4.1.2	4.1	4.1-21	No off-site improvements associated with the BP Watson project, such as water supply, natural gas or wastewater pipelines, are currently planned. The BP Watson project will connect to the existing supply pipelines currently located at the facility. ~~Additionally, the BP Watson project will tie in to the existing Watson Cogeneration ammonia distribution system for use in the air pollution control system.~~..	The Project as originally designed and presented in the AFC would have tied into the existing Watson Cogeneration facility's anhydrous ammonia distribution system. However, due to the Air District's 2010 request for the Project to use aqueous ammonia instead of anhydrous, the Project will no longer tie in to the Watson Cogeneration's anydrous ammonia system. Refer to edited PSA text.
4.1.3	4.1	4.1-22	The SCR will utilize aqueous ammonia from a new dedicated 12,000 gallon aqueous ammonia storage tank. Based on a capacity factor of 95% and an ammonia concentration of ~~19~~ 30 wt%, the annual ammonia requirement will be ~~181,040~~114,660 gallons/yr.	The text has been edited to reflect the Project's design for the use of 30 weight percent (wt%) aqueous ammonia and the corresponding yearly ammonia requirement. The suggested edits are consistent with the comments that Watson Cogeneration Company issued on SCAQMD's Preliminary Determination of Compliance (PDOC). Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.4	4.1	4.1-24 4.1-74, 75	...The applicant intends to use drift eliminators on the cooling ~~towers~~ tower cells designed to limit drift to ~~0.0005%~~0.001% of the circulating water volume per unit time. Total Dissolved Solids (TDS) in the cooling tower water would be limited to 3,575 ppmw. These limits are included as part of Condition of Certification **AQ-SC10**. Condition AQ-SC10 The new cooling tower cells daily PM10 emissions shall be limited to 7.92 lb/day in total for both cooling tower cells. The cooling ~~towers~~ tower cells shall be equipped with a drift eliminator to control the drift fraction to ~~0.0005%~~0.001% of the circulating water flow.	As stated in the AFC, the Project's cooling tower cells are designed to limit drift to 0.001%. Refer to the edited PSA text for corrections of additional occurrences of drift text.
4.1.5	4.1	4.1-35 4.1-37, 38	...The applicant estimates ~~that the~~ a maximum NOx emission rate ~~(~~of 211 lbs/hr~~) is most likely to occur~~ during the ~~water injection~~ commissioning phase ~~when the water injection will be 50% effective and the turbine train will be at 50% load~~. The maximum CO emission rate ~~(~~will be 255 lbs/hr~~) will most likely occur when the water injection is 100% effective and the turbine train is at 100% load (SCR and oxidation catalyst are not yet commissioned)~~. Water Injection Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. One method has been steam or water injected into the combustor cans to reduce combustion temperatures and the formation of thermal NOx, which is the primary source of NOx emissions from a CTG. This method has been employed for many years and is well understood and has been proposed for the GE 7EA turbines for this project.	The Project will have dry low NOx burners, not water injection. Refer to edited PSA text for corrections of additional occurrences of water-injection text not itemized here. Please consider deleting or revising the discussion of water injection.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.6		4.1-37	Combustion Turbine To reduce CO emissions, the applicant proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst. The use of a clean-burning fuel (natural gas) and the efficient combustion process of the CTGs will limit VOC and PM10 emissions. The use of natural gas, low sulfur refinery gas ~~and butane~~, or a blend of natural gas and refinery gas will limit SO_2 emissions.	Text has been corrected to accurately reflect the fuel to be used for the Project. The Project will not use butane, although the existing Watson Cogeneration units are permitted for butane. Refer to edited PSA text. Note that the reference to butane in Condition AQ-1 is correct because SCAQMD's PM10 condition covers the Project plus the existing Watson Cogeneration units.
4.1.7	4.1	4.1-66, 67	Air Quality Table ~~22~~23 SCAQMD Permit Conditions with Corresponding Commission Conditions of Certification SCAQMD Condition D29.X3 / CEC Condition AQ-7: Requires source tests for specific pollutants (SOx and~~,~~ VOC~~,~~ ~~PM10~~) once every three years. SCAQMD Condition D29.X4 / CEC Condition AQ-7: Requires source tests for specific pollutants (PM10) once every year~~s~~. Cross-reference of SCAQMD conditions and CEC conditions: ~~D12.X2~~D12.X4 for AQ-12 ~~D12.X3~~D12.X2 for AQ-13 ~~D12.X4~~D12.X3 for AQ-14	Table number has been corrected to 23 because the preceeding table (Refined Modeling Maximum Impacts) was Table 22. A similar correction made later in the PSA where the text references this table. Also, the text within the table has been edited to match the analogous text in the SCAQMD PDOC. Refer to edited PSA text.
4.1.8	4.1	4.1-68	Condition AQ-SC1 **...**for the entire project site ~~and linear facility~~ construction. ...shall have full access to all areas of construction on the project site~~, and linear facilities~~...	The Project does not include the construction of any linear facilities. Text has been edited for clarity, as shown at left. Other occurrences of linear discussions have been edited throughout the Air Quality section, but those edits are not itemized in this table. This comment is also noted in this table as Comment G.2 (meaning that the requested change applies to all of the PSA). Refer to edited PSA text in the Air Quality section.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.9	4.1	4.1-70	Condition AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner...	Clarification from the CEC is requested regarding how to determine the potential for visible dust plumes to be transported "within 400 feet upwind of any regularly occupied structures not owned by the project owner."
4.1.10	4.1	4.1-75	Condition AQ-1 PM10: 1,243 lbs in any one ~~month~~ day (Note: this limit is based on the total combined emissions from all 5 Watson Cogeneration units.)	Suggested clarification has been added to the text for consistency with the PDOC. Refer to edited PSA text.
4.1.11	4.1	4.1-77	Condition AQ-4 The new combustion turbine~~Each combustion turbine~~ stack shall have the following emission limitations. • 2.0 PPM NOx emission averaged over 60 minutes at 15% oxygen, dry basis. • 2.0 ppm CO emission averaged over ~~60~~180 minutes at 15% oxygen, dry basis.	Text has been edited to reflect that this condition pertains only to the Project (not to the existing Watson Cogeneration units) and to make the time span consistent with the analogous PDOC condition. Refer to edited PSA text.
4.1.12	4.1	4.1-77	Condition AQ-5 The project owner may ~~at no time purposefully~~ exceed either the mass or concentration emission limits, but not both limits at the same time, as set forth in Conditions of Certification **AQ-1, -2, -3** or **-4**.	Suggested clarification has been added to the text for consistency with the PDOC. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.13	4.1	4.1-78	Condition AQ-6 ...Refinery gas is defined as a mixture of refinery fuel gas, produced within the refinery that may be mixed with ~~, and~~ natural gas obtained from a utility regulated by the Public Utilities Commission (PUC) in order to balance heat content of the fuel gas mixture~~, for which the natural gas component of the mixture shall not exceed 50% of the total, by Higher Heating Value (HHV) content~~... The operator shall limit the CTG firing rate to no more than 1069.9 MM Btu per hour. The operator shall limit the HRSG duct burner firing rate to no more than 510 MM Btu per hour. The operator shall install and maintain a(n) continuous monitoring system to accurately indicate the energy being supplied to the~~input at the~~ gas turbine by measurement of Higher Heating Value (HHV) of refinery fuel gas.	Text has been edited to reflect the definition of refinery fuel gas, as presented in the comments that Watson Cogeneration Company issued on the PDOC. Text has been edited to correct the HRSG limit. Refer to edited PSA text.
4.1.14	4.1	4.1-79	Condition AQ-7 The project owner shall conduct an initial source test for NOx, CO, SOx, VOC, NH_3 and PM10 and periodic source test every three years thereafter for NOx, CO, SOx, VOC and PM10 of the ~~each gas~~ new turbine exhaust stack in accordance with the following requirements... Source Test Requirements Table: VOC: District Method 25.3 or TO-12 Exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute and ~~dry~~ actual cubic feet per minute.	Text has been edited to reflect that this condition pertains only to the Project (not to the existing Watson Cogeneration units) and to be consistent with the PDOC. Refer to edited PSA text.
4.1.15	4.1	4.1-80, 81	Condition AQ-8 The project owner shall conduct source testing of the ~~each gas~~ turbine exhaust stack in accordance with the following requirements... ...Source testing shall be conducted to determine the ammonia emissions from the ~~each gas~~ new turbine exhaust stack...	Text has been edited to reflect that this condition pertains only to the Project (not to the existing Watson Cogeneration units) and to be consistent with the PDOC. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.16	4.1	4.1-81, 82	Condition AQ-9 The project owner shall install and maintain a CEMS in the ~~in each~~ exhaust stack of the combustion turbine train~~s~~ to measure the following parameters... The CEMS shall be installed and operated to measure CO concentration over a ~~15 minute~~one and three hour averaging time period. The NOx CEMS shall be installed and operating no later than ~~12~~90 days ~~months~~ after initial start-up of the turbine.	Text has been edited to reflect that this condition pertains only to the Project (not to the existing Watson Cogeneration units) and to be consistent with the PDOC. Refer to edited PSA text.
4.1.17	4.1	4.1-82 thru 84	Condition AQ-11 The owner/operator shall determine the hourly ammonia slip emissions from the~~each~~ exhaust stack ~~for each gas turbine individually~~ via both the following formula... Exceedances shall be deemed chronic if they total more than 10% of the operation ~~for any single exhaust stack~~.	Text has been edited to reflect that this condition pertains only to the Project (not to the existing Watson Cogeneration units) and to be consistent with the PDOC. Refer to edited PSA text.
4.1.18	4.1	4.1-84	Condition AQ-12 The operator shall install and maintain an ammonia injection flow meter and recorder to accurately indicate and record the ammonia injection flow rate being supplied the turbine. The device or gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months. ~~The ammonia injection system shall be placed in full operation as soon as the minimum temperature is reached. The minimum temperature is listed as 540 degrees F at the inlet to the SCR reactor~~.	Text has been edited to be consistent with the analogous PDOC condition. Refer to edited PSA text.
4.1.19	4.1	4.1-84, 85	Condition AQ-13 The operator shall install and maintain a temperature gauge and recorder to accurately indicate and record the temperature in the exhaust at the inlet of the SCR reactor. The gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months. ~~The catalyst temperature range shall remain between 740 degree F and 840 degree F. The catalyst temperature shall not exceed 840 degrees F. The temperature range requirement of this condition does not apply during startup operations of the turbine.~~	Text has been edited to be consistent with the analogous PDOC condition. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.1.20	4.1	4.1-85	Condition AQ-14 The gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months. ~~The pressure drop across the catalyst shall not exceed 12 inches of water column during the start-up period.~~	Text has been edited to be consistent with the analogous PDOC condition. Refer to edited PSA text.
Section 4.2	**Biological Resources**			
4.2.1	4.2	4.2-14, 15	Condition BIO-3 **DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY** **BIO-3** The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification. If required by the Designated Biologist or Biological Monitor(s), the project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist. The Designated Biologist or Biological Monitor(s) shall... **Verification:** The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM...	Suggested edits have been made to authorize the Biological Monitor to act on behalf of the Designated Biologist. Refer to edited PSA text. Also, various minor edits have been suggested throughout this section of the PSA text. The minor miscellaneous edits have not been itemized in this table. Refer to edited PSA text.
Section 4.3	**Cultural Resources**			
4.3.1	4.3	4.3-34	Condition CUL-3 Specification of the manner in which human remains and grave associated artifacts, if discovered during construction, will be treated according to the applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans.	A suggested addition has been made to the CRMMP list. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 4.4	**Hazardous Materials**			
4.4.1	4.4	4.4-17	Condition HAZ-2 The project owner shall concurrently provide a Business Plan and a Risk Management Plan (RMP) prepared pursuant to the California Accidental Release Program (CalARP) to the Los Angeles County Fire Department (LACOFD) and the CPM for review. After receiving comments from the LACOFD and the CPM, the project owner shall reflect all recommendations in the final documents. Copies of the final Business Plan and RMP shall then be provided to the LACOFD for information and to the CPM for approval.	The Applicant will update the existing Watson Cogeneration facility's Business Plan and Risk Management Plan to include the Project. No edits have been made to the PSA text.
4.4.2	4.4	4.4-19	Condition HAZ-8 The project owner shall also prepare a site-specific security plan for the commissioning and operational phases that will be available to the CPM for review and approval. The project owner shall implement site security measures that address physical site security and hazardous materials storage.	The BP Carson Refinery provides security for the existing Watson Cogeneration facility and will provide security for the Project. The Applicant will update the existing security to include the Project. No edits have been made to the PSA text.
Section 4.9	**Soil and Water**			
4.9.1	4.9	4.9-9	Watson has not identified a source or volume of imported fill planned for grading activities at the site at this time. It is anticipated that the planned geotechnical investigation will directly address the presence of expansive soils at the project site and identify any required amendments to the existing soils (Watson, 2010a).	As stated in the June 2010 Responses to Questions from California Energy Commission Staff (response to Question 4) and in the AFC Project Description (Subsection 3.8.1.1, pages 3-51 and 3-53): "No fill is anticipated, but in the event fill is required, material present on-site is expected to be adequate, subject to final geotechnical evaluation." Also, refer to Global comment G.1 requesting CEC to reconcile the reference citations within the text against the reference lists at the end of each PSA section. The reference list at the end of this section does not have a "Watson, 2010a", so it is unclear which document the CEC staff is referring to.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.9.2	4.9	4.9-10	The Phase I ESA found recognized environmental conditions for the BP Watson site, both onsite and offsite. The current and historical uses of the BP Watson site within the larger Watson Cogeneration facility and BP Carson Refinery indicate that contaminants of concern include but are not limited to hazardous substances used in petroleum refining and maintenance operations. A limited soil investigation at the site in 1985 found evidence of hydrocarbons in the fill and underlying native soils. ~~The findings of the Phase I ESA recommended a Phase II ESA be performed on the project site.~~ ~~The Phase II ESA has not been completed and/or presented by Watson at this time. However,~~ The investigation of soil and groundwater contamination is part of a separate ongoing investigation/remediation by the BP Carson Refinery Project as part of their Cleanup and Abatement Order (CAO). During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint. The samples will be analyzed to investigate the potential petroleum hydrocarbon impacts on the subsurface soils. During the Project geotechnical assessment and construction activities, any excavated soil will be managed pursuant to applicable BP Carson Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site-specific health and safety plan and applicable BP Carson Refinery procedures.	The Applicant is not required to conduct soil sampling in areas where excavation will occur. The suggested text change is based on the Applicant's October 2009 Response to Data Request #37. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.9.3	4.9	4.9-14 4.9-30	Watson indicates that the existing Watson Cogeneration facility currently receives approximately 45% of water supplied as steam to its HRSG as returned condensate from its STGs and the BP Carson Refinery. This condensate displaces the use of untreated water by the cogeneration facility. The BP Watson project will also utilize this condensate supply to reduce project water consumption (URS, 2010a). However, it is unclear to Energy Commission staff how the reduction in total water supply would be split between BP Watson and the existing Watson Cogeneration facility – ideally Watson could update the water balance (AFC Table 5.5-4) to include the condensate return. Additional discussion on Page 4.9-30: However, Watson revised water supply estimates in response to Data Request 48, indicating that total water supply to the BP Watson project and the existing Watson Cogeneration facility would be about 1,252 afy less than estimates in provided in the AFC because about 45% of the water supplied as to the HRSGs and BP Refinery is returned as condensate (URS, 2010a). Watson also indicated that the water balance provided in Table 5.5-9 would not be affected by that clarification (URS, 2010a). Staff cannot reconcile the revised Table 5.5-9 and the water balance provided in Table 5.5-4 (Watson, 2009a). The BP Watson project should revisit and possibly revise the water balance flow diagram provided in Figure 5.5-1 and the water balance provided in Table 5.5-4 to account for the returned condensate. Staff would like to update the water supply estimates and the delivery estimates to account for the returned condensate in the Final Staff Assessment.	As discussed and agreed to during the January 20, 2010 Issues Resolution Workshop, the only Condition of Certification on the Project water supply was to be a voluntary Condition on the efficiency of use. The Applicant requests that this topic be discussed and resolved in the PSA Workshop.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.9.4	4.9	4.9-20	~~A Phase II ESA would provide more detailed information regarding the extent and and location of any existing soil and/or groundwater contamination.~~ During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint, and analyzed to investigate the subsurface soils for petroleum hydrocarbon impacts. During the Project geotechnical assessment and during construction activities, any excavated soil will be managed pursuant to applicable Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site specific health and safety plan and applicable refinery procedures.	The Applicant is not required to conduct soil sampling in areas where excavation will occur. The suggested text change is based on the Applicant's October 2009 Response to Data Request #37. Refer to edited PSA text.
4.9.5	4.9	4.9-30 and 4.9-40, 41	~~To monitor water use, the BP Watson project is required to install and maintain metering devices as part of the water supply and distribution system to monitor the use of the primary and secondary sources of water supplied to the project for cooling water, domestic potable water, and other plant uses. Condition of Certification **SOIL&WATER-5** requires installation and monitoring of metering devices on all water supply lines at BP Watson. To limit the use of the municipal and groundwater secondary water supplies beyond the quantities evaluated in this Staff Assessment, Condition of Certification **SOIL&WATER-5** also requires the BP Watson project to obtain CPM approval for the use of secondary municipal and groundwater water supply during planned disruptions to the primary reclaimed water supply.~~	The Applicant requests deletion of the current PSA Condition SOIL&WATER-5. As discussed during the January 20, 2010 Issues Resolution Workshop, a voluntary Condition of Certification on the efficiency of water use was to be the only water supply Condition of Certification. A similar edit has been made to the Condition of Certification on Pages 4.9-40 and 4.9-41. Refer to edited PSA text.
4.9.6	4.9	4.9-30 and 4.9-41, 42	Condition of Certification **SOIL&WATER-6** requires installation and monitoring of metering devices on the water supply ~~the reverse osmosis supply~~ lines to the Fifth Train and the steam and high-pressure water lines that deliver water to the BP Carson Refinery.	The text has been edited for clarity and for consistency with the voluntary Condition of Certification that was discussed during the January 20, 2010 Issues Resolution Workshop and documented in the Applicant's April 2010 Supplement to Responses to Questions from the January 20, 2010 Issues Resolution Workshop. A similar correction has been made to the Condition of Certification on Page 4.9-42. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.9.7	4.9	4.9-42	Condition SOIL&WATER-8 ~~**SOIL&WATER-8:** Prior to beginning any site mobilization activities, the West Basin Municipal Water District shall submit an Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson to the California Department of Public Health and Los Angeles Regional Water Quality Control Board for review and approval. The Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson shall be prepared in accordance with Titles 17 and 22 of the California Code of Regulations, the Health and Safety Code, and the Water Code. The Project shall comply with any reporting and inspection requirements set forth by the California Department of Public Health and Los Angeles Regional Water Quality Control Board.~~ ~~At least 30 days prior to the start of any site mobilization activities, the West Basin Municipal Water District shall submit an updated Water Recycling Requirements permit from the Los Angeles Regional Water Quality Control Board and approval of the Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson from the California Department of Public Health to the CPM. The Project owner shall submit copies to the CPM of all correspondence between the Project owner and the California Department of Public Health and/or the Los Angeles Regional Water Quality Control Board related to the Water Recycling Requirements permit or the Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson within 10 days of its receipt or submittal.~~	The Applicant requests deletion of the current PSA Condition SOIL&WATER-8. As discussed during the January 20, 2010 Issues Resolution Workshop, a voluntary Condition of Certification on the efficiency of water use was to be the only water supply Condition of Certification. SOIL&WATER-6 reflects that Condition. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 4.10	**Traffic and Transportation**			
4.10.1	4.10	4.10-19, 20	Condition TRANS-2: **TRANS-2** During project construction, the project owner will monitor and record all incoming (loaded vehicle) traffic as part of project record keeping and compliance monitoring to ensure that project related traffic is accounted for during the construction phase of the project. **Verification**: Within 30 days after completion of the project, the project owner shall provide the CPM and City of Carson project construction traffic delivery logs with a summary of daily truck traffic separate from worker or light vehicle traffic.	The Applicant requests replacement of the current PSA Condition TRANS-2 with the suggested condition presented at left. Refer to edited PSA text. Rationale for requesting this change: Project construction contribution to the local and regional roadway circulation system is but a small fraction to baseline conditions. The roadway facilities within the Project study area currently and historically support the trucking operations and goods movement originating from and going to the Ports of Long Beach and Los Angeles, as well as the logistics of petrochemical industries in the area. As an example and as described in the AFC, peak Project construction deliveries by heavy trucks is 42 daily trips in (PCE) passenger car equivalent (actual 14 daily truck trips multiplied by 3 PCE) and as compared to 23,175 vehicles on Alameda Street (refer to AFC, p. 5.11-2). Based on the above information, the proportion of Project truck traffic that presumably could contribute to roadway wear and tear in context to existing daily traffic is negligible at 0.2 percent. Furthermore, it is all but impossible to document before- and after-construction roadway conditions and to isolate project construction traffic effects on a roadway system that is continually supporting two major port operations within the immediate vicinity of the Project study area. In addition, the Applicant does not wish to imply that they would ask the County or Caltrans "to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place…" These types of requests are typically not entertained by agencies, as some projects are bound by target completion dates specified by their funding mechanisms/sources or grant conditions. The Applicant shall endeavor to cooperate to the extent feasible in accommodating public right-of-way repair or improvement in a manner that will facilitate and will not hinder the timely completion of the aforementioned improvements.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 4.12	**Visual Resources**			
4.12.1	4.12	4.12-16	Staff concludes the introduction of Project structures would not substantially degrade the existing viewshed of KOP 1. The *Moderately Low* overall visual sensitivity, combined with the *Moderately Low* overall visual change, would result in a less than significant visual impact.	Text has been corrected to match the earlier description on Page 4.12-14 of the PSA. Refer to edited PSA text.
4.12.2	4.12	4.12-22	Condition VIS-1 The Project owner shall prepare and implement a landscape plan for the areas shown in red and green on **Visual Resources Figure 4** of the preliminary staff assessment in accordance with the City of Carson's General Plan policies and municipal codes regarding landscaping along public streets and in parking lot areas (refer back to **Visual Resources Table 2**)...The landscape plan will also provide landscaping along the Refinery property line on Wilmington Avenue.	Clarification from the CEC is requested regarding the landscaping requirement along Wilmington Avenue (the area designated in green in Visual Resources Figure 4). This area is already landscaped. If the current landscaping is adequate, then it is suggested that the Condition be amended to require that this existing landscaping be maintained.
4.12.3	4.12	4.12-23	Condition VIS-2 Verification: ...Within 48 hours of receiving a lighting complaint, the project owner shall provide the Compliance Project Manager with a complaint resolution form report as specified in the General Conditions section including a proposal to resolve the complaint, and a schedule for implementation.	The Project is located at the existing Watson Cogeneration facility and adjacent to the BP Carson Refinery. It may be difficult to ascertain whether a complaint pertains to the lights of the Project or the lights of the existing structures.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 4.13	**Waste Management**			
4.13.1	4.13	4.13-9	~~If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. .The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.~~ During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint, and analyzed to investigate the subsurface soils for petroleum hydrocarbon impacts. During the Project geotechnical assessment and during construction activities, any excavated soil will be managed pursuant to applicable BP Carson Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site-specific health and safety plan and applicable BP Carson Refinery procedures.	The Applicant is not required to conduct soil sampling in areas where excavation will occur. The suggested text change is based on the Applicant's October 2009 Response to Data Request #37. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.13.2	4.13	4.13-11 4.13-18	...The foundation excavations would require that approximately 7,000 cubic yards of existing fill material be removed, monitored, and handled according to regulatory requirements ~~and stockpiled~~. Staff has included Condition of Certification **WASTE-1** to require the applicant to sample and analyze soil to be excavated during construction to insure that it is properly classified as hazardous or nonhazardous[2] and ensure applicable handling environmental compliance requirements are met. Condition of Certification **WASTE-2** would require that prior to initiating any earthwork on the project site; the project owner shall prepare and submit to the ~~LARWQCB, and to the~~ Compliance Project Manager (CPM) for approval, a Soils Management Plan... Condition WASTE-2 Prior to initiating any earthwork on the project site, the project owner shall prepare and submit to the ~~Los Angeles Regional Water Quality Control Board, and to the~~ CPM for approval, a Soils Management Plan (SMP). The SMP should include but is not limited to the following: ... ~~• This SMP should be submitted to the Los Angeles Regional Water Quality Control Board as part of the cleanup plans required by Cleanup and Abatement Orders 84-17 and 90-121;~~ Verification: At least 60 days prior to any earthwork, including those earthwork activities associated with the site mobilization, ground disturbance, or grading as defined in the general conditions of certification the project owner shall submit the Soils Management Plan to the ~~Los Angeles Regional Water Quality Control Board for review and comment, and to the~~ CPM for approval...	The text has been edited to provide clarity. Also, the Soils Management Plan is not required by the LARWQCB, but is required by SCAQMD. As discussed in the Applicant's October 2009 Response to Data Request #37, the RWQCB has indicated that its approval of a work plan for collecting soil samples during the geotechnical investigation is not required for this construction project. All excavated soil for this Project will be transported off-site for treatment or disposal at a BP-approved facility. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
4.13.3	4.13	4.13-17	However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **9**. These conditions would require the project owner to do all of the following: • ~~Ensure the project site is investigated and any contamination identified is remediated, as necessary, with appropriate professional and regulatory agency oversight (**WASTE-1**, **2**, **3**, and **6**).~~[Refer to Comment 4.13.3].	The Applicant is not required to conduct soil sampling in order to assess the subsurface conditions of the project site. The Project will conduct soil sampling and analysis only in the areas where excavation will be conducted, in order to dispose of any contaminated excavated soil and protect construction workers. The purpose of the Project is not to assess and remediate subsurface soils. As discussed in the Applicant's October 2009 Response to Data Request #37, investigation of soil and groundwater contamination is part of a separate ongoing investigation/ remediation by the BP Carson Refinery Project as part of their Cleanup and Abatement Order (CAO). The ongoing investigation programs include appropriate pre-assessment and screening, segregation and management of potentially volatile-organic-carbon-impacted soils on the BP Refinery site. Because construction will take place over a former reservoir, just as construction of adjacent Cogeneration Units No. 1 though No. 4 previously, construction and soil management will be completed consistent with the previous construction activities, and will be compliant with current refinery soil management procedures, health and safety regulatory requirements, and worker protection. These procedures will ensure compliance with applicable environmental, and health and safety regulatory requirements. Refer to edited PSA text.
4.13.4		4.13-19	Condition WASTE-6 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations.	The Project will be using the existing hazardous waste generator identification number of BP West Coast Products LLC – Carson Refinery. EPA ID# CAD077227049.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 5.1	**Facility Design**			
5.1.1	5.1	5.1-17	Condition STRUC-3 Verification: ~~On a schedule suitable to the CBO, the~~The project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM.	Text has been clarified because design changes are not scheduled activities. Refer to edited PSA text.
Section 5.2	**Geology and Paleontology**			
5.2.1	5.2	5.2-3	Table 1 (LORS, CEQA row): Mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site.	Appendix G of CEQA is the Environmental Checklist Form. Fossils are only mentioned in the checklist question "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?"
5.2.2	5.2	5.2-3	Table 1 (LORS, SVP row): The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate or significant invertebrate fossils or significant suites of plant fossils~~paleontological resources~~. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists.	Text has been edited for clarification. Refer to edited PSA text.
5.2.3	5.2	5.2-12	Proposed Conditions of Certification **PAL-1 to PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level. Essentially, these conditions require a worker education program in conjunction with monitoring of earthwork activities by qualified professional paleontologists (paleontologic resource specialist; PRS). Earthwork in the immediate vicinity is halted any time potential fossils are recognized by either the paleontologist or the worker.	Text has been edited for consistency with Condition PAL-4. Refer to edited PSA text.

Comment Number	PSA Section	Page Number[1]	PSA Statement[2]	Comments to CEC[3]
Section 5.4	**Power Plant Reliability**			
5.4.1	5.4	5.4-2	In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs. ~~As a load-serving entity, Watson is obligated to satisfy these criteria, which include maintaining a 15% reserve margin and increasing local generation to reduce reliance on imported power.~~	Watson is not a load-serving entity and is not obligated to maintain a reserve margin. Text has been corrected. Refer to edited PSA text.

Comments on the
PRELIMINARY STAFF ASSESSMENT:
Edits and Corrections
APPLICATION FOR CERTIFICATION (09-AFC-1)

for Watson Cogeneration Steam and Electric Reliability Project

Submitted to:
California Energy Commission
1516 9th Street , MS 15
Sacramento, CA 95814-5504

Submitted by:
Watson Cogeneration Company
22850 South Wilmington Avenue
Carson, CA 90745

With support from:
URS Corporation
8181 East Tufts Avenue
Denver, CO 80237

January 2011

APPLICANT COMMENTS ON THE PRELIMINARY STAFF ASSESSMENT for the WATSON COGENERATION STEAM AND ELECTRIC RELIABILITY PROJECT

This submittal provides Watson Cogeneration Company's (Watson's or the Applicant's) comments on the Preliminary Staff Assessment (PSA) issued by the California Energy Commission (CEC) on December 17, 2010, for the Watson Cogeneration Steam and Electric Reliability Project.

1. **PSA Text:** Watson has provided edits directly to the PSA text. Deletions are shown in red strikethrough and additions are shown in red underlining. The changes are cross-referenced with the PSA Comments Table, which provides an explanation or justification for the edits to the PSA.

2. **PSA Comments Table:** This table provides an explanation or further background on the Applicant's comments, edits, clarifications, and/or corrections to specific PSA text. It is organized consistent with the sections of the PSA and provides cross-referencing to the PSA text.

The following technical areas in the PSA are addressed in this submittal:

Section 3 Project Description

Section 4 Environmental Assessment

- Section 4.1 Air Quality
- Section 4.2 Biological Resources
- Section 4.3 Cultural Resources
- Section 4.4 Hazardous Materials Management (PSA Comments Table only; no text edits)
- Section 4.9 Soil and Water Resources
- Section 4.10 Traffic and Transportation
- Section 4.12 Visual Resources
- Section 4.13 Waste Management

Section 5 Engineering Assessment

- Section 5.1 Facility Design
- Section 5.2 Geology and Paleontology
- Section 5.4 Power Plant Reliability

PROJECT DESCRIPTION

Alan Solomon

INTRODUCTION

The Watson Cogeneration Company (Watson) currently operates a 385 megawatt (MW) cogeneration power plant facility (Facility) that is located in the British Petroleum (BP) Carson refinery in the City of Carson in Los Angeles County, California. The existing Facility was licensed by the California Energy Commission in 1986 (85-AFC-1) and has been in operation since 1988.

On March 19, 2009, Watson filed an Application for Certification (AFC) with the California Energy Commission requesting approval to modify the Facility. On July 29, 2009, the Energy Commission accepted the AFC, with the supplemental information, as complete. With the proposed modifications, the Watson Cogeneration Steam and Electric Reliability (BP Watson) project is projected to increase the Facility's electricity generation by 85 MW and provide additional process steam to the adjacent BP Carson Refinery.

PROJECT PURPOSE AND OBJECTIVES

Watson's objective is to improve the reliability of steam supply at the BP Carson Refinery by adding a fifth train to the existing four trains at the Facility, which would complete the original, five train design of the Facility. This fifth train would add a nominal 85 MWs, resulting in a total production of 470 MWs, and deliver an additional long-term supply of steam to the BP Carson Refinery. The high reliability of the BP Watson would significantly reduce the possibility of refinery upsets due to loss of steam or power.

This project would address the future electricity needs of California, construct and operate an electrical generating facility on an existing brown-field site, provide additional electrical capacity within the County of Los Angeles, utilize existing Facility infrastructure to reduce environmental impacts and costs, and enhance the reliability of the state's electrical system by providing power generation near the centers of electrical demand.

The proposed project site consists of 2.5 acres located within the boundary of the existing 21.7-acre Facility. The project area is zoned Heavy Manufacturing and is surrounded by existing refineries and other industrial facilities.

The project would include the addition of one General Electric (GE) 7EA combustion turbine generator (CTG) with an inlet fogging system, one duct-fired heat recovery steam generator (HRSG), two redundant natural gas compressors, one boiler feedwater (BFW) pump, one circulating water pump, two new cells added to an existing cooling tower, an electrical distribution system, and a new on-site 69kV gas insulated substation. The steam produced by the fifth train would be delivered to the existing steam header shared by the four existing cogeneration trains. The proposed project would use the existing water supply pipeline, natural gas pipeline, wastewater pipeline, and electric transmission lines.

PROJECT LOCATION

The proposed BP Watson project is located in the County of Los Angeles, in the City of Carson. The Dominguez Channel is located approximately 0.4 mile to the east, the Pacific Ocean is approximately 8.5 miles to the west of the project, and Long Beach Harbor is approximately five miles to the south (See **Project Description Figure 1**).

As mentioned, the proposed project would occupy a 2.5-acre brown field site within the existing boundary of the existing 21.7-acre area Facility. The project site is located approximately 0.7 mile south of the 405 Freeway, roughly bounded by East 223rd Street to the north, Wilmington Avenue to the west, East Sepulveda Boulevard to the south, and South Alameda Street to the east, in the City of Carson. The street address of the project site is located within the confines of the Facility at 22850 South Wilmington Avenue. The Construction Laydown and Parking Area, owned by BP, is a paved 25-acre parcel located approximately 1 mile southeast of the proposed project site, at the northeast corner of East Sepulveda Boulevard and South Alameda Street. The street address is at 2149 East Sepulveda Boulevard (See **Project Description Figure 2**).

The project site area is zoned Heavy Manufacturing and is surrounded by existing refineries and other industrial facilities. Adjoining and nearby properties within one mile to the west are commercial properties. Residential neighborhoods are five miles north of the project site.

PROJECT FEATURES

AIR QUALITY CONTROL

Air emissions from the combustion of natural gas will be controlled using state of the art systems. Emissions CO and ROG will be reduced with the use of a CO catalyst system and a selective catalytic reduction (SCR) system that will use aqueous ammonia to control NOx emissions. ~~assist in the reduction process.~~ Emissions of particulate matter and SOx will be limited through the use of gaseous fuels. A Continuous Emissions Monitoring system will be installed to monitor emissions from the exhaust stacks.

NATURAL GAS SUPPLY

The existing Facility is serviced by Southern California Gas Company's natural gas pipeline which connects to a pipe rack at the refinery. The additional fifth train (BP Watson project) will obtain its gas from the existing refinery natural gas system at an interface point on the pipe rack. Natural gas for the fifth train will be compressed by two new redundant dedicated gas compressors and will be served via a six-inch connection with the refinery gas supply system, downstream of existing compressors.

WATER SUPPLY

The BP Refinery would supply the BP Watson project with reclaimed water. The BP Refinery is in the process of converting its industrial water uses to reclaimed supplies from the West Basin Municipal Water District.

STORM WATER AND WASTEWATER DISCHARGE

Industrial and storm water will be discharged to the existing oily water system at the BP Refinery. Storm water runoff from the project will also be directed to the oily water system. There will be no off-site discharges from the project. The existing sanitary system for the Facility is served by a connection to the sewer operated by the Los Angeles County Sanitation District.

TRANSMISSION SYSTEM

Electric power generated at the Facility that is not consumed for internal refinery use, is transmitted from the existing switchyard to the Southern California Edison (SCE) Hinson Substation via a 230kV double-circuit, single conductor line that is approximately 1.6 miles long. From the switchyard, a new on-site 69kV gas insulated substation (GIS) will provide power to the refinery and connect the fifth train to the 230kV line for delivery to the existing on-site 230kV GIS. The 230kV GIS is then connected to the SCE Hinson Substation via two 230kV SCE transmission lines. From there, the generated power would be connected to the regional electric grid. Upgrades to the existing transmission lines are not required.

The on-site interconnection facility is an existing 230kV gas insulated indoor substation which connects via outdoor SCE line connection.

PROJECT CONSTRUCTION AND OPERATION

The project construction is expected to take approximately 26 months from the site mobilization to commercial operation.

CONSTRUCTION WORKFORCE

There would be an average and peak workforce of approximately 41 and 80 persons, respectively, consisting of construction crafts, supervisory, support, and construction management personnel on site during construction. Personnel requirements would peak from Month Six through Month 16 of the construction period.

OPERATION WORKFORCE

No new operators or other staff would be hired for the proposed project as it would be operated and maintained by existing staff. The facility will be in operation 24 hours per day/seven days per week.

FACILITY CLOSURE

The anticipated life of a new cogeneration facility is at least 30 years. Continued operation of the Facility beyond this time is likely to be viable, especially with good maintenance practices; however, at an appropriate point beyond that, the project would cease operation and close down. At that time it would be necessary to ensure that the closure occurs in such a way that the public health and safety and the environment are protected from adverse impacts.

Although the setting for this project does not appear to present any special or unusual closure problems, it is impossible to foresee what the situation would be in 30 years or more when the project ceases operation. Because the conditions that would affect the decommissioning decision are largely unknown at this time, these conditions would be presented to the Energy Commission when more information is available and the timing for decommissioning is more imminent. Facility closure would be consistent with laws, ordinances, regulations and standards in effect at the time of closure.

REFERENCES

ARCO 1985a – ARCO Petroleum Products Company. 1985. Application for Certification ARCO Watson Cogeneration Project. Submitted to California Energy Commission. May 31.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

AIR QUALITY

Steve Radis

SUMMARY OF CONCLUSIONS

Staff finds that with the adoption of the attached conditions of certification the proposed Watson Cogeneration Steam and Electric Reliability (BP Watson) Project would comply with all applicable laws, ordinances, regulations, and standards (LORS) and would not result in any significant air quality-related impacts. Staff also finds that:

- The project would comply with applicable South Coast Air Quality Management District (SCAQMD or District) Rules and Regulations, including New Source Review (NSR) requirements (SCAQMD 2010a).
- The project would not cause new violations of any NO_2, SO_2, or CO ambient air quality standards, and therefore, the project's direct NOx, SOx and CO emission impacts are not significant.
- Without proper mitigation, the project's NOx and VOC emissions would potentially contribute to existing violations of the state's 1-hour and the federal 8-hour ozone air quality standards. Staff has determined that emission offset credits from the South Coast Air Basin would mitigate the project's contribution to ozone impacts to a level that is not cumulatively considerable (**AQ-SC7**).
- Without mitigation, the project's PM10 emissions and PM10 precursor emissions of SOx would contribute to the existing violations of the state 24-hour PM10 air quality standard. However, staff has determined that PM10 emissions would be within currently permitted levels under Title V and that SOx emission reductions credits would mitigate the project's contribution to PM10 and PM10 precursor emissions impacts to a level that is not cumulatively considerable.
- Without mitigation, the project's PM2.5 emissions and PM2.5 precursor emissions of SOx would contribute to the existing violations of the state 24-hour PM2.5 air quality standard. However, staff has determined that PM2.5 emissions would be within currently permitted levels under Title V and that SOx emission reductions credits would mitigate the project's contribution to PM2.5 and PM2.5 precursor emissions impacts to a level that is not cumulatively considerable.
- Staff has analyzed the potential incremental greenhouse gas (GHG) emission impacts from the proposed project and concludes that they are not cumulatively considerable and thus do not represent a significant impact under the California Environmental Quality Act (CEQA). Refer to the Greenhouse Gas Appendix for details.

INTRODUCTION

The Watson Cogeneration Steam and Electric Reliability (BP Watson) Project is a proposed expansion of a steam and electrical generating (cogeneration) facility that is located in the City of Carson in Southern California. The BP Watson project will complete the original design of Watson Cogeneration Facility that has been in continuous operation for more than 20 years. The BP Watson project would add a nominal 85 megawatt (MW) combustion turbine generator (CTG) with a single-pressure heat recovery steam generator (HRSG) to provide additional process steam to the BP Carson refinery. The original plant design allocated plot space and included provisions to accommodate a new unit at a later date. The additional unit is sized and designed to provide reliable base load operations with supplemental duct firing in the HRSG.

The BP Watson project includes one General Electric (GE) 7EA CTG, with an inlet fogging system, one duct fired HRSG, two redundant natural gas compressors, one boiler feedwater (BFW) pump, one circulating water pump, two new cells added to an existing cooling tower, electrical distribution system, instrumentation and controls, and all necessary auxiliary equipment as described herein. The BP Watson project's primary objective is to provide additional process steam in response to the refinery's process steam demand.

The BP Watson project complements the existing cogeneration facility located within the confines of the refinery. The existing facility has four GE 7EA CTGs, four HRSGs and two steam turbine generators (STG). In operation since 1988, the existing cogeneration facility is owned by Watson Cogeneration Company (Watson) and operated by BP West Coast Products, LLC – BP Carson Refinery. Watson is a joint partnership between subsidiaries of BP America and Edison Mission Energy. Since the BP Watson project consists of adding a fifth CTG/HRSG to the existing configuration, it is also referred to as the "fifth train."

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Air Quality Table 1 summarizes the applicable LORS. The District issued its Preliminary Determination of Compliance (PDOC) (SCAQMD-2010) for the project on October 12, 2010. The PDOC, or determination of compliance with District rules and regulations, included a set of air quality conditions that are drafted to ensure continuous compliance during construction and operation of the facility. Staff has incorporated the District conditions in this Preliminary Staff Assessment.

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

40 Code of Federal Regulations (CFR) 52	Nonattainment New Source Review (NSR) requires a permit and requires Best Available Control Technology (BACT) and Offsets. Permitting and enforcement delegated to SCAQMD. Prevention of Significant Deterioration (PSD) requires major sources to obtain permits for attainment pollutants. A major source is defined as any one pollutant exceeding 250 tons per year, unless the

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

	source is a named PSD category (which the BP Watson project is not), when the limit is 100 tons per year. Since the emissions from the BP Watson project are not expected to exceed 250 tons per year, PSD does not apply. However, greenhouse gases may trigger PSD review after January 2011. See Greenhouse Gas Appendix.
40 CFR 60 Subpart KKKK	New Source Performance Standard for gas turbines: 15 parts per million (ppm) NOx at 15% O_2 and fuel sulfur limit of 0.060 lb SOx per million Btu heat input. BACT will be more restrictive. Enforcement delegated to SCAQMD.
40 CFR Part 70	Title V: Federal permit assuring compliance with all applicable Clean Air Act requirements. Title V permit application required within one year of start of operation. Permitting and enforcement delegated to SCAQMD. BP Watson would be required to amend their existing Title V permit to include the new unit.
40 CFR Part 72	Acid Rain Program. Requires permit and obtaining sulfur oxides credits. Permitting and enforcement delegated to SCAQMD.
State	
Health and Safety Code (HSC) Section 40910-40930	Permitting of source needs to be consistent with approved Clean Air Plan.
HSC Section 41700	Restricts emissions that would cause nuisance or injury.
HSC Sections 21080, 39619.8, 40440.14 (AB1318)	Requires the executive officer of the South Coast Air Quality Management District, upon making a specified finding, to transfer emission reduction credits for certain pollutants from the South Coast District's internal emission credit accounts to eligible electrical generating facilities.
Local – South Coast Air Quality Management District (SCAQMD)	

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Regulation II: Permits	This regulation sets forth the regulatory framework of the application for issuance of construction and operation permits for new, altered and existing equipment.
Regulation IV: Prohibitions	This regulation sets forth the restrictions for visible emissions, odor nuisance, fugitive dust, various air emissions, fuel contaminants, start-up/shutdown exemptions and breakdown events.
Regulation VII: Emergencies	Establishes the procedures for reporting emergencies and emergency variances.
Regulation IX: Standards of Performance for New Stationary Sources	Regulation IX incorporates provisions of 40 CFR Part 60, Chapter I, and is applicable to all new, modified, or reconstructed sources of air pollution. Sections of this regulation apply to electric utility steam generators (Subpart Da) and stationary combustion turbines (Subpart KKKK). These subparts establish limits of PM10, SO_2, and NO_2 emissions from the facility as well as monitoring and test method requirements.
Regulation XI: Source Specific Standards	Specifies the performance standards for stationary engines larger than 50 brake horse power (bhp).
Regulation XIII: New Source Review	Establishes the pre-construction review requirements for new, modified or relocated facilities to ensure that these facilities do not interfere with progress in attainment of the national ambient air quality standards and that future economic growth in the SCAQMD is not unnecessarily restricted. However, this regulation does not apply to NOx or SOx emissions from certain sources, which are addressed by Regulation XX (RECLAIM).
Regulation XVII: Prevention of Significant Deterioration	This regulation sets forth the pre-construction requirement for stationary sources to ensure that the air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth.
Regulation XX: Regional Clean Air Incentives Market (RECLAIM)	RECLAIM is designed to allow facilities flexibility in achieving emission reduction

Air Quality Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

	requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reductions.
Regulation XXX: Title V Permits	The Title V federal program is the air pollution control permit system required by the federal Clean Air Act as amended in 1990. Regulation XXX defines the permit application and issuance as well as compliance requirements associated with the program. Any new or modified major source which qualifies as a Title V facility must obtain a Title V permit prior to construction, operation or modification of that source. Regulation XXX also integrates the Title V permit with the RECLAIM program such that a project cannot proceed without the other.
Regulation XXXI Acid Rain Permits	Title IV of the federal Clean Air Act provides for the issuance of acid rain permits for qualifying facilities. Regulation XXXI integrates the Title V program with the RECLAIM program. Regulation XXXI requires a subject facility to obtain emission allowances for SOx emissions as well as monitoring SOx, NOx, and carbon dioxide (CO_2) emissions from the facility.

SETTING

The BP Watson project site is a 2.5-acre brown field site located within the boundary of the existing Watson Cogeneration Facility, which is a 21.7-acre area within the 428-acre parcel further described as Assessor's Parcel Number (APN) 7315-006-003, 1801 Sepulveda Boulevard, Carson, California, 90745 and is integral to Watson's existing Carson Refinery (BP Refinery). The street address of the BP Watson project site is located within the boundary of the existing Watson Cogeneration Facility at 22850 South Wilmington Avenue, Carson, California. An existing warehouse/maintenance shop on a portion of the site will be removed as part of the BP Watson project. The BP Watson project site is located approximately 0.7 mile south of the 405 Freeway, roughly bounded by Wilmington Avenue to the west, East Sepulveda Boulevard to the south, and South Alameda Street to the east. The site Universal Transverse Mercator (UTM) coordinates are as follows: 384725.7mE, 3742300mN, Zone 11 (NAD27).

The BP Watson project site elevation is approximately 32 feet above mean sea level (MSL). Because the site is located within the existing refinery property boundary, the BP Watson project site and surrounding areas are highly developed, and have been subject to disturbance for many years.

CLIMATE AND METEOROLOGY

Climate

The climate of the South Coast Air Basin (basin) is strongly influenced by the local terrain and geography. The basin is a coastal plain with connecting broad valleys and low hills, bounded by the Pacific Ocean on the west, and relatively high mountains forming the north, south, and east perimeters. The climate is mild, tempered by cool sea breezes and is dominated by the semipermanent high pressure of the eastern Pacific.

Across the 6,600-square-mile basin, there is little variation in the annual average temperature of 62°F (see **Air Quality Table 2**). However, the eastern portion of the basin (generally described as the Inland Empire area), experiences greater variability in annual minimum and maximum temperatures as this area is farther from the coast and the moderating effect on climate from the ocean is weaker. All portions of the basin have recorded temperatures well above 100°F. January is usually the coldest month, while the months of July and August are usually the hottest.

The majority of the rainfall in the basin falls during the period from November through April (see **Air Quality Table 3**). Annual rainfall values range from approximately 9 inches per year in Riverside, to 14 inches per year in downtown Los Angeles. Monthly and annual rainfall totals can vary considerably from year to year. Cloud cover, in the form of fog or low stratus, is often caused by persistent low inversions and the cool coastal ocean water. Downtown Los Angeles experiences sunshine approximately 73% of the time during daylight hours, while the inland areas experience a slightly higher amount of sunshine, and the coastal areas a slightly lower value.

Although the basin is characterized by a semi-arid climate, the air near the surface can often have high relative humidity due to the presence of a shallow marine layer on most days. Except for infrequent periods of off-shore winds, the marine layer strongly influences the local climate. Periods of heavy fog are common, with “high fog” (low stratus clouds) a frequent and characteristic occurrence. The annual average relative humidity ranges from approximately 70% in the coastal areas to 57%in the inland parts of the basin.

The basin is characterized by light average wind speeds and poor ventilation. Wind speeds in the downtown Los Angeles area average 5.7 miles per hour (mph), with little seasonal variation. Coastal wind speeds typically average about two mph faster than the downtown wind speeds, with the inland areas showing wind speeds slightly slower than the downtown Los Angeles values.

Air Quality Table 2
Temperature Data for Long Beach, California

Month	Monthly Temperatures			Extremes		Mean Number of Days			
						Maximum		Minimum	
	Daily Max	Daily Min	Mean	Highest Temp	Lowest Temp	90°F & Above	32°F & Below	32°F & Below	0°F & Below
Jan	66.9	45.6	56.3	93	25	0.1	0	0.2	0
Feb	67.2	47.3	57.3	91	33	0.1	0	0	0
Mar	68.3	49.7	59	98	33	0.3	0	0	0
Apr	71.7	52.3	62	105	38	0.9	0	0	0
May	73.6	56.9	65.2	104	40	1	0	0	0
Jun	77.1	60.3	68.7	109	47	1.5	0	0	0
Jul	82.4	63.8	73.1	107	51	3.6	0	0	0
Aug	83.9	64.9	74.4	105	55	5.3	0	0	0
Sep	82.2	62.8	72.5	110	50	5.5	0	0	0
Oct	78.1	57.9	68	111	39	3.2	0	0	0
Nov	72.2	50.6	61.4	101	34	0.7	0	0	0
Dec	67.1	45.3	56.2	92	28	0	0	0.2	0
Annual	74.2	54.8	64.5	111	25	22.2	0	0.4	0
Winter	67.1	46.1	56.6	93	25	0.2	0	0.4	0
Spring	71.2	53	62.1	105	33	2.2	0	0	0
Summer	81.1	63	72.1	109	47	10.4	0	0	0
Fall	77.5	57.1	67.3	111	34	9.4	0	0	0

Data from 1958 through 2009.
Reference: WRCC 2009.

Air Quality Table 3
Precipitation Data for Long Beach, California

Month	Rainfall							Snowfall inches	
	Inches			Mean Number of Days					
	Mean	Highest Monthly	Highest Daily	0.01” or More	0.10” or More	0.50” or More	1.0” or More	Mean	One-Day Max.
Jan	2.6	12.76	3.75	6	4	2	1	0	0
Feb	2.94	12.09	2.78	6	4	2	1	0	0
Mar	1.85	8.75	3.46	5	4	1	0	0	0
Apr	0.7	4.42	1.61	3	2	0	0	0	0
May	0.19	2.32	2.03	1	0	0	0	0	0
Jun	0.06	0.86	0.86	1	0	0	0	0	0
Jul	0.02	0.34	0.27	0	0	0	0	0	0

Aug	0.07	2.03	1.75	0	0	0	0	0	0
Sep	0.2	1.45	1.39	1	0	0	0	0	0
Oct	0.39	5.34	1.97	2	1	0	0	0	0
Nov	1.24	6.05	2.03	3	2	1	0	0	0
Dec	1.63	5.29	3.17	5	3	1	0	0	0
Annual	11.89	27.67	3.75	34	21	8	3	0	0

Data from 1958 through 2009.
Reference: WRCC 2009.

Summer wind speeds are typically higher than winter wind speeds. The re-circulating sea-breeze is the dominant wind pattern in the basin, characterized by a daytime on-shore flow and a nighttime land breeze. This pattern is broken by the occasional winter storm, or the strong northeasterly flows from the mountains and deserts north of the basin known as “Santa Ana winds.”

Along the southern California coast, surface air temperatures are relatively cool. Coupled with warm, dry subsiding air from aloft, the potential for early morning inversions is high, i.e., approximately 87% of all days. These can affect vertical mixing of pollutants. The basin-wide average occurrence of inversions at ground level (surface) is 11 days per month, and varies from two days per month in June to 22 days per month in December. Upper air inversions, with bases at less than 2,500 feet above MSL occur approximately 22 days each month, while higher based inversions, up to 3,500 feet above MSL occur approximately 191 days per year.

Representative climatic data for the BP Watson project area was derived from the Long Beach WSCMO Station (#045085, Period of Record 4-1-58 to present) located five miles to the east of the BP Watson project site. A summary of data from this site indicates the following:

- Average maximum daily temperature 74.2°F
- Average minimum daily temperature 54.8°F
- Highest mean maximum annual temperature 90.5°F
- Lowest mean minimum annual temperature 41.8°F
- Mean annual precipitation 12.94 inches

Air quality is determined primarily by the type and amount of pollutants emitted into the atmosphere, the nature of the emitting source, the topography of the air basin, and the local meteorological conditions. In the BP Watson project area, inversions and light winds can result in conditions for pollutants to accumulate in the region.

Ambient Air Quality Standards

The United States Environmental Protection Agency (U.S. EPA) and the California Air Resource Board (CARB) have both established allowable maximum ambient concentrations of criteria air pollutants based on public health impacts, called ambient air quality standards (AAQS). The state AAQS, established by CARB, are typically lower (more stringent) than the federal AAQS, established by the U.S. EPA. The state and federal air quality standards are listed in **Air Quality Table 4**. As indicated, the averaging times for the various air quality standards (the duration over which all measurements taken are averaged) range from one hour to one year (annual). The standards are read as a concentration, in parts per million (ppm), or as a weighted mass of material per unit volume of air, in milligrams (10^{-3} g, 0.001 g, or mg) or micrograms (10^{-6} g, 0.000001 g, or μg) of pollutant in a cubic meter (m^3) of air, averaged over the applicable time period.

In general, an area is designated as attainment for a specific pollutant if the concentrations of that air contaminant do not exceed the standard. Likewise, an area is designated as non-attainment for an air contaminant if that standard is violated. Where not enough ambient data is available to support designation as either attainment or non-attainment, the area can be designated as unclassified. Unclassified areas are normally treated the same as attainment areas for regulatory purposes. An area can be designated as attainment for one air contaminant and non-attainment for another, or attainment for the federal standard and non-attainment for the state standard for the same contaminant. The entire area within the boundaries of an air district is usually evaluated to determine the SCAQMD attainment status.

The ambient air quality standards shown in **Air Quality Table 4** define the maximum amount of a pollutant that can be present in outdoor air without harm to the public's health. These standards are set at levels to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants, and include a margin of safety.

Air Quality Table 4
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m^3)	--
	8 Hour	0.07 ppm (140 μg/m^3)	0.075 ppm (147 μg/m^3)
Respirable Particulate Matter (PM10)	24 Hour	50 μg/m^3	150 μg/m^3
	Annual*	20 μg/m^3	--
Fine Particulate Matter (PM2.5)	24 Hour	--	35 μg/m^3
	Annual*	12 μg/m^3	15 μg/m^3
Carbon Monoxide (CO)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	8 Hour	9 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	0.18 ppm (338 μg/m^3)	0.100 ppm**
	Annual*	0.030 ppm (56 μg/m^3)	0.030 ppm (56 μg/m^3)
Sulfur Dioxide (SO_2)	1 Hour	0.25 ppm (655 μg/m^3)	0.075 ppm (196 μg/m^3)***
	3 Hour	--	0.5 ppm (1300 μg/m^3)
	24 Hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)

Pollutant	Averaging Time	California Standard	Federal Standard
	Annual*	--	0.03 ppm (80 μg/m^3)
Lead	30 Day Average	1.5 μg/m^3	--
	Calendar Quarter	--	1.5 μg/m^3
	Rolling 3-mo Ave		0.15 μg/m^3
Sulfates	24 Hour	25 μg/m^3	--
Hydrogen Sulfide (H_2S)	1 Hour	0.03 ppm (42 μg/m^3)	--
Vinyl Chloride (chloroethene)	24 Hour	0.010 ppm (26 μg/m^3)	--
Visibility Reducing Particulates	8 hours	In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70%.	--
* Annual Arithmetic Mean; **Three-year average of 98th percentile daily maximum 1-hour values, effective April 12, 2010. *** Effective June 2, 2010, the U.S. EPA established this standard as the 3-year average of the annual 99th percentile of 1-hour daily maximum concentrations.			

Source: CARB 2010a.

EXISTING AMBIENT AIR QUALITY

The project is located in the City of Carson and is under the jurisdiction of the SCAQMD. **Air Quality Table 5** lists the attainment and non-attainment status of the district for each criteria pollutant for both the federal and state ambient air quality standards.

Ambient air quality data has been collected extensively in the air basin. **Air Quality Table 6** lists a summary of maximum ambient measurements for the years 2003 through 2009 at the monitoring stations closest to the project site.

Comparison of the values in **Air Quality Table 6** to the most restrictive AAQS in **Air Quality Table 4** clearly shows that ozone, PM10, and PM2.5 continue to violate applicable state and federal standards while CO, NO_2 and SO_2 do not violate the standards.

Air Quality Table 5
Attainment / Non-Attainment Classification
South Coast Air Quality Management District (SCAQMD)

Pollutants	Federal Classification	State Classification
Ozone	**Non-Attainment**	**Non-Attainment**
PM10	**Non-Attainment**	**Non-Attainment**
PM2.5	**Non-Attainment**	**Non-Attainment**

CO	Attainment	Attainment
NO_2	Attainment [1]	Attainment
SO_2	Attainment	Attainment

1. Attainment status for the new federal 1-hour NO_2 standard is scheduled to be determined by January 2012.

Source: CARB 2010a

Air Quality Table 6
Criteria Pollutant Summary
Maximum Short Term Ambient Concentrations (ppm or µg/m^3)

Pollutant	Averaging Period	Units	2003	2004	2005	2006	2007	2008	2009	Limiting AAQS
Ozone	1 hour	ppm	0.099	0.090	0.091	0.081	0.099	0.093	0.089	0.09
Ozone	8 hour	ppm	0.068	0.074	0.069	0.058	0.073	0.074	0.067	0.07
PM10[a]	24 hours	µg/m^3	63	72	66	78	75	63	62	50
PM10[a]	Annual	µg/m^3	32.8	33.1	29.6	31.1	30.2	29.1	30.2	150
PM2.5[b]	24 hours	µg/m^3	115.2	66.6	41.4	34.9	40.8	38.9	34.1	35
PM2.5[b]	Annual	µg/m^3	18.0	17.6	16	14.2	14.6	14.2	13.9	15
CO	1 hour	ppm	5.5	4.2	4.2	4.2	3.3	3.3	2.9	20
CO	8 hour	ppm	4.7	3.4	3.5	3.4	2.6	2.6	2.17	9
NO2	1 hour	ppm	0.14	0.12	0.14	0.10	0.11	0.13	0.075	0.18
NO2	Annual	ppm	0.0288	0.028	0.0241	0.0215	0.0207	0.0208	0.0185	0.03
SO2	1 hour	ppm	0.033	0.042	0.041	0.027	0.037	0.087	0.017	0.25
SO2	3 hour	ppm	0.020	0.026	0.033	0.023	0.028	0.010	0.011	0.5
SO2	24 hour	ppm	0.008	0.012	0.010	0.010	0.011	0.012	0.009	0.04
SO2	Annual	ppm	0.0025	0.0051	0.0022	0.0012	0.0027	0.0022	0.0015	0.03

Note: a) Maximum PM10 concentration based on California monitoring methodology.
b) Maximum PM2.5 concentration based on national monitoring methodology.

Source: CARB 2010b

Attainment Criteria Pollutants

Although both NO_2 and SO_2 are classified as in attainment with all state and federal AAQS, they remain of significant concern since they are both precursors to PM10, and NO_2 is a precursor to ozone. Because NO_2 and SO_2 are precursors to non-attainment pollutants, the SCAQMD will require full offset mitigation for both.

Nitrogen Dioxide (NO_2)

Most combustion activities and engines emit significant quantities of nitrogen oxides (NOx), a term used in reference to combined quantities of nitrogen oxide (NO) and NO_2. Most of the NOx emitted from combustion sources is NO. Although only NO_2 is a criteria pollutant, NO is readily oxidized in the atmosphere into NO_2. In urban areas, the ozone concentration level is typically high. That level will drop substantially at night as NO is oxidized into NO_2, and increase again in the daytime as sunlight disassociates NO_2 into NO and ozone. This reaction explains why urban ozone concentrations at ground level can be relatively low near large NO emission sources, while downwind rural areas (without sources of fresh NO emissions) are exposed to higher ozone concentrations as arriving NO_2 dissociates into NO and ozone in the presence of sunlight.

Sulfur Dioxide (SO_2)

Sulfur dioxide is typically emitted as a result of the combustion of fuels containing sulfur. In significant ambient quantities, SO_2 can lead to acid rain and sulfite particulate formation. Natural gas contains very little sulfur and consequently produces very few SO_2 emissions when combusted. By contrast, fuels high in sulfur, such as lignite (a type of coal), emit large amounts of SO_2 when combusted. Sources of SO_2 emissions within the basin come from every economic sector and include a wide variety of gaseous, liquid and solid fuels.

Carbon Monoxide (CO)

CO is generated from most combustion engines and other combustion activities. CO is considered a local pollutant, as it will rapidly oxidize to carbon dioxide. It is thus found in high concentrations only near the source of emissions. Automobiles and other mobile sources are the principal source of CO emissions. High levels of CO emissions can also be generated from fireplaces and wood-burning stoves. Industrial sources, including power plants, typically constitute less than 10% of the ambient CO levels in the South Coast region (CARB 2006).

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Because the mobile sector (ships, cars, trucks, busses and other vehicles) is the main source of CO, ambient concentrations of CO are highly dependent on traffic patterns. Carbon monoxide concentrations in the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the counties in California are in compliance with the state and federal CO AAQS.

Non-Attainment Criteria Pollutants

The following sections provide background information for the non-attainment criteria pollutants: ozone, PM10, and PM2.5.

Ozone (O_3)

Ozone is not directly emitted from stationary or mobile sources, but is formed as the result of chemical reactions in the atmosphere between precursor air pollutants. The primary ozone precursors are NOx and volatile organic compounds (VOC), both of which interact in the presence of sunlight to form ozone.

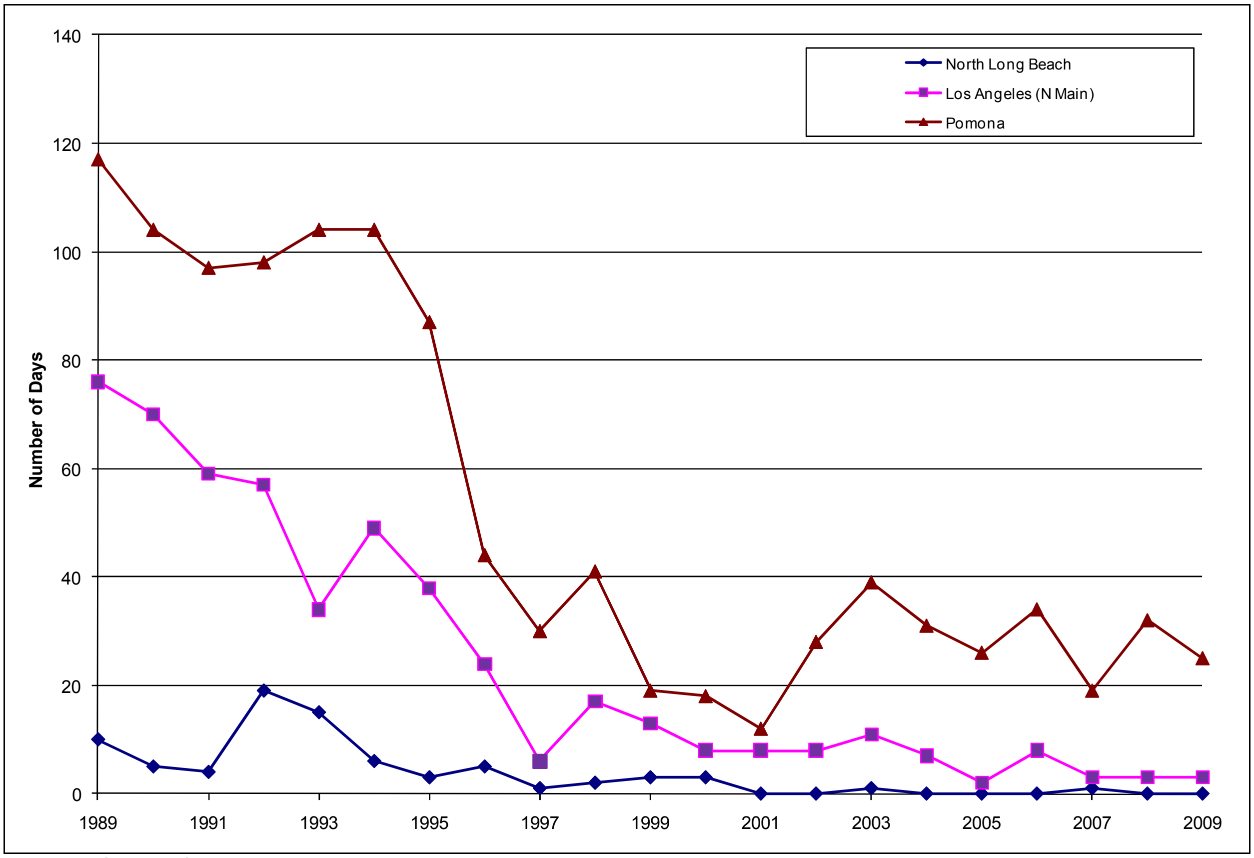
The SCAQMD is designated as extreme nonattainment for the federal 8-hour ozone standard. Efforts to achieve ozone attainment typically focus on controlling the ozone precursors NOx and VOC. SCAQMD-published state implementation plans (SIP) largely rely on the CARB to control mobile sources, the U.S. EPA to control emission sources under federal jurisdiction, and SCAQMD to control local industrial sources. Through these control measures, California and the SCAQMD are required to reach attainment of the federal 8-hour ozone ambient air quality standard by 2024.

Exceedances of the national and state ozone ambient air quality standards occur in the region both up wind and downwind of the project site. **Air Quality Figure 1** shows the number of days each year with exceedances of the state 1-hour ozone standard at three representative monitoring sites. The three monitoring sites were chosen to represent three distinct parts of the air shed: coastal region, proposed project region, and inland region.

The proposed project area is represented in **Air Quality Figure 1** by the North Long Beach monitoring station. The Pomona monitoring station is in an area very near the inland regions of the SCAQMD. The data clearly shows the characteristic trend to higher ambient ozone concentrations farther away from the coast, due to prevailing onshore airflow. **Air Quality Figure 2** provides a graphical representation of this effect for a single year, showing how the onshore airflow pushes pollution inland and thus focuses regional violations away from the coast.

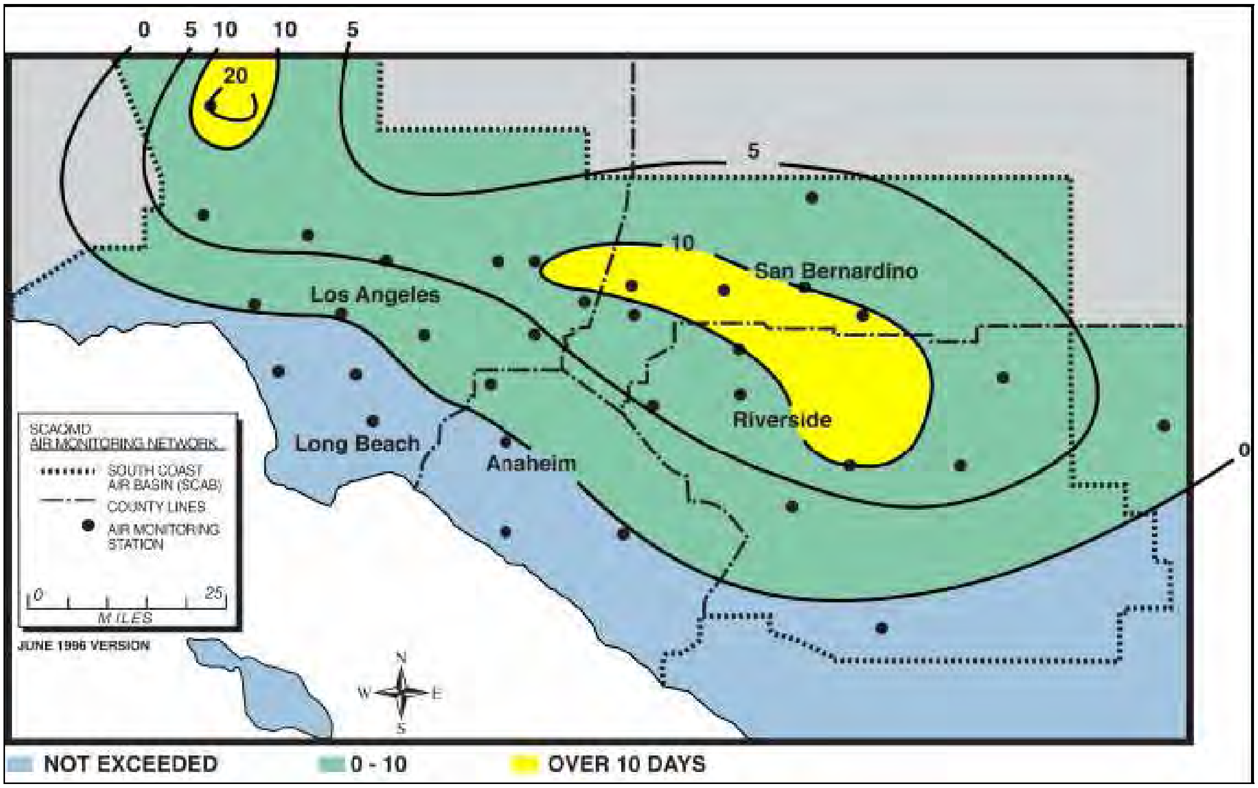
Though there are a significant number of exceedances of the ozone ambient air quality standards throughout the South Coast air basin, it is important to consider the improvements that have occurred in recent years. The SCAQMD leads the nation in air quality management methods and regulatory programs. These programs have significantly improved the air quality in spite of the growing population and industrial and commercial enterprises. **Air Quality Figure 1** clearly shows the improvements in ozone air quality levels over the past 16 years in the South Coast air basin, especially in the intermediate region near the proposed project site. As shown in **Air Quality Figure 1**, in 2003 there was a slight increase over prior years in the number of exceedances recorded. Since 2003 however, the downward trend has returned, approaching the 2002 lower number of exceedances. However, the trends for inland areas suggest these areas will not meet the original federal attainment date of 2010, but instead will meet federal attainment in 2021 for the South Coast air basin.

Air Quality Figure 1
OZONE 1989-2009
Number of Days Exceeding the State 1-Hour AAQS



Source: CARB 2010b

Air Quality Figure 2
OZONE – 2006 Number of Days Exceeding 1-Hour Federal Standard
(1-hour average ozone > 0.12 ppm)



Source: SCAQMD 2006

Respirable Particulate Matter (PM10)

PM10 is generated both directly from a combustion process and generated downwind of a source when various emitted precursor pollutants chemically interact in the atmosphere to form solid precipitates. These solids are called secondary particulates, because they are not directly emitted, but are generated as a consequence of facility emissions. Gaseous emissions of pollutants such as NOx, SO_2 and VOC from turbines, and ammonia (NH_3) from NOx control equipment can form particulate nitrates, sulfates, and organic solids.

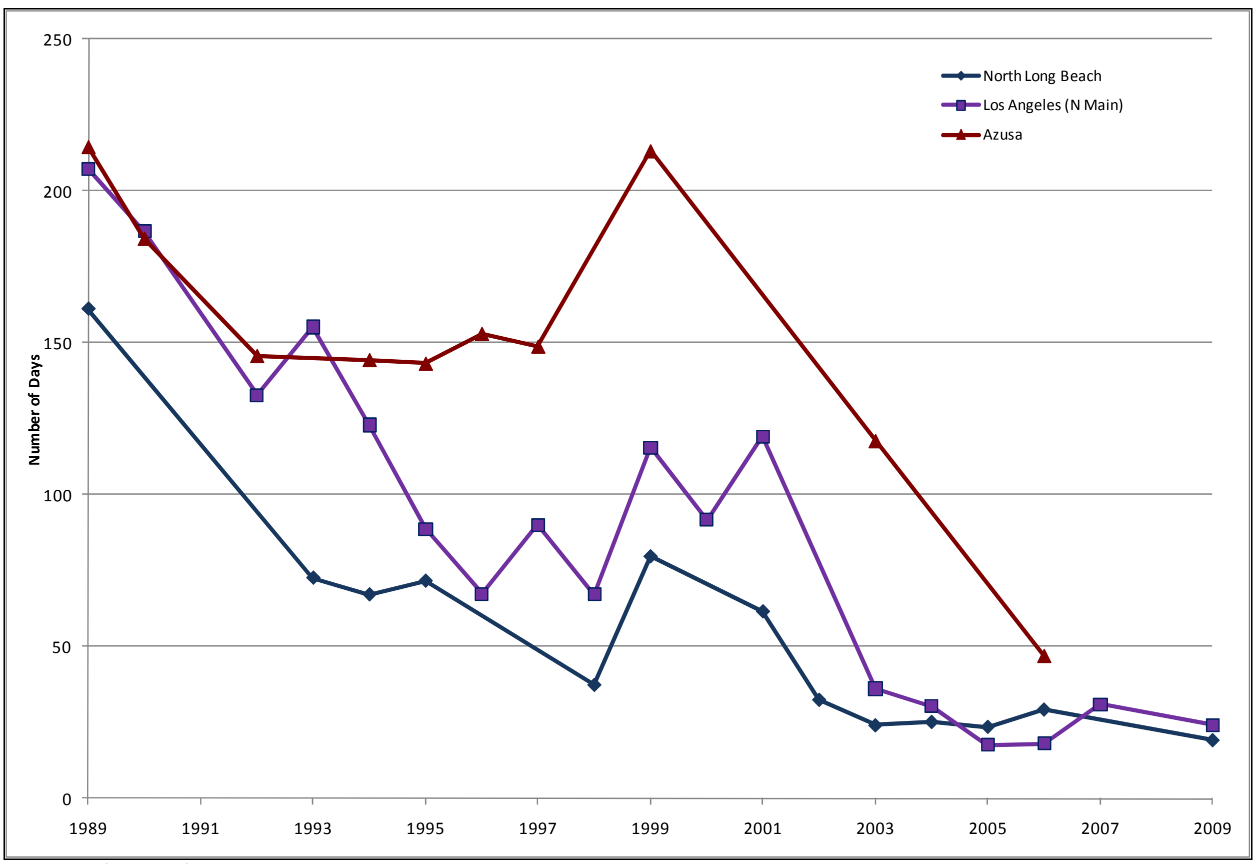
The SCAQMD has been designated a non-attainment area for the federal 24-hour and annual PM10 ambient air quality standards. The South Coast air basin has been designated as a non-attainment zone for the state 24-hour and annual PM10 ambient air quality standards. **Air Quality Figure 3** below shows the number of days each year on which exceedances of the state 24-hour PM10 standard occurred for three representative monitoring regions: coastal/project site, mid-basin and inland. The data shows some improvement over the period, but overall the PM10 situation remains a concern.

Fine Particulate Matter (PM2.5)

PM2.5, a subset of PM10, consists of particles with an aerodynamic diameter less than or equal to 2.5 microns. Particles within the PM2.5 fraction penetrate more deeply into the lungs, and can be much more damaging by weight than larger particulates. PM2.5 is primarily a product of combustion and includes nitrates, sulfates, organic carbon (ultra fine dust) and elemental carbon (ultra fine soot). **Air Quality Figure 4** below shows the number of days each year on which exceedances of the new federal 24-hour PM2.5 standard of 35 $\mu g/m^3$ (there is no separate short-term state standard) occurred for three representative monitoring regions: coastal, project site, and inland.

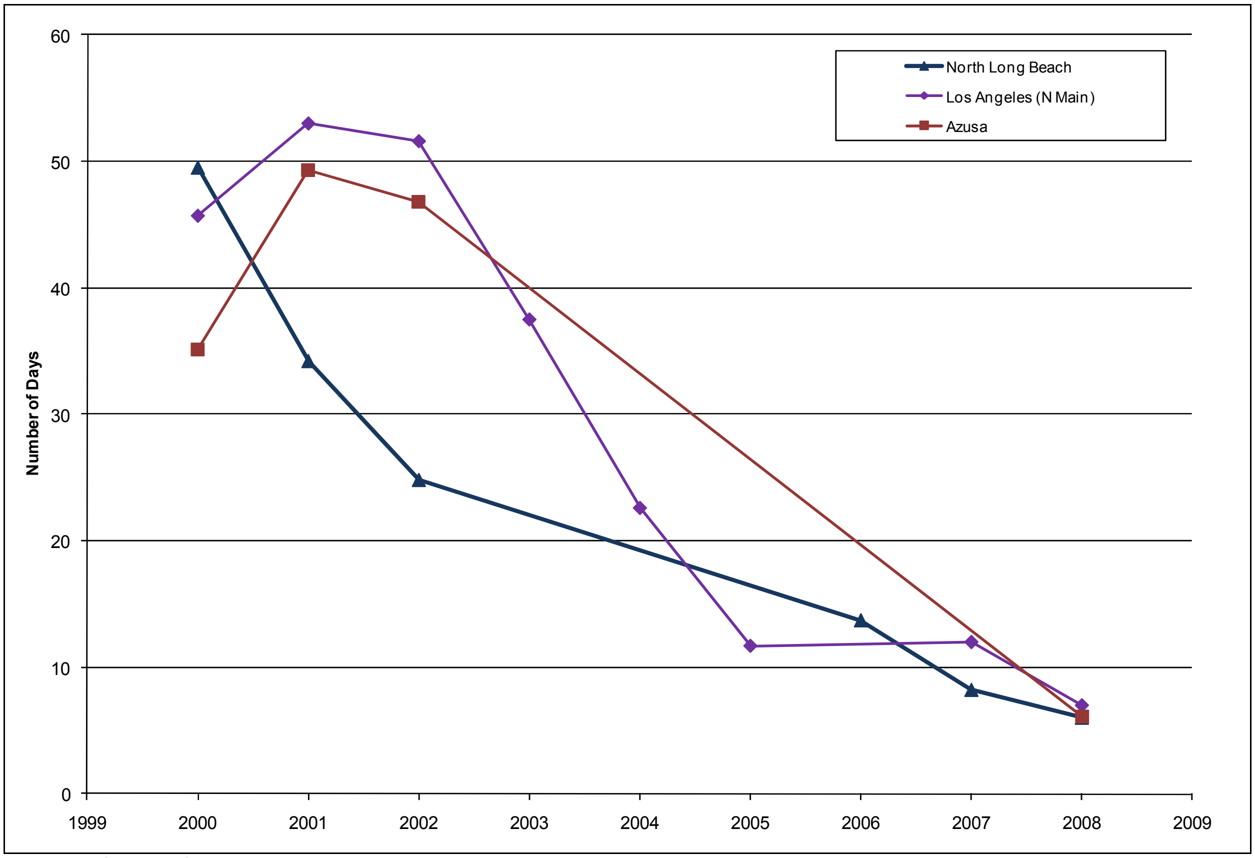
The highest concentrations of PM2.5 in the South Coast air basin occur in the most highly urbanized inland areas of the air basin. This effect is shown graphically in **Air Quality Figure 5** below.

Air Quality Figure 3
PM10 1989-2009
Number of Days Exceeding the State 24-Hour AAQS



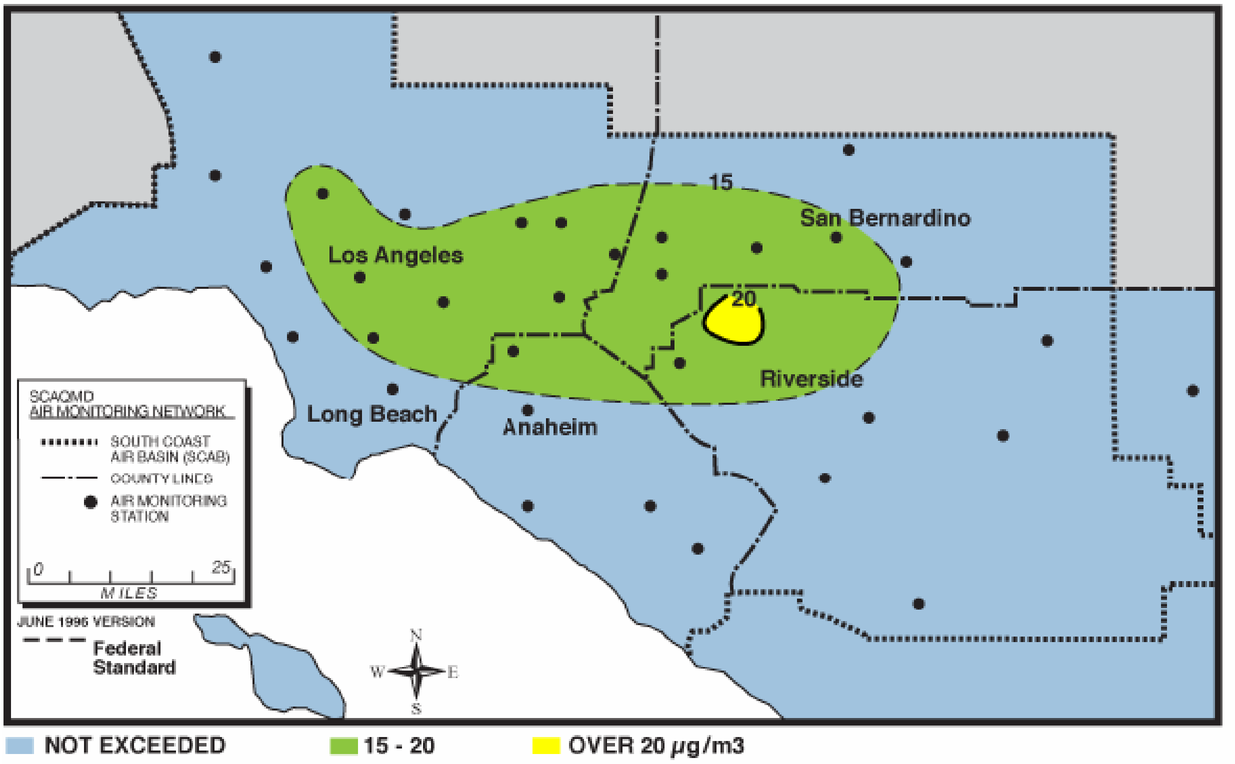
Source: CARB 2008a, 2010.

Air Quality Figure 4
PM2.5 1999-2008
Number of Days Exceeding the Federal 24-Hour 35 µg/m³ AAQS



Source: CARB 2008a, 2010.

Air Quality Figure 5
PM2.5 – 2006
Annual Arithmetic Mean, µg/m³



Source: SCAQMD 2006

PM2.5 standards were first adopted by U.S. EPA in 1997, and were upheld by the United States Supreme Court in 2001 over a challenge from the American Trucking Association (ATA et al). The South Coast air basin is designated as non-attainment for all state and federal PM2.5 AAQS. The SCAQMD has submitted a PM2.5 SIP, and once the plan is approved by USEPA, the SCAQMD will prepare revised NSR rules that will likely require offsetting of PM2.5 emissions. The SCAQMD is thus unlikely to address PM2.5 in their rules within the schedule of this proposed project. Staff, however, has a responsibility under the California Environmental Quality Act (CEQA to address PM2.5 emissions, and will do so, taking into consideration the fact that the proposed project region is not in attainment with adopted PM2.5 standards.

Existing Ambient Air Quality Summary

Based on the above analysis of background ambient air quality, staff recommends the use of the background ambient air pollutant concentrations in **Air Quality Table 7** for the purpose of modeling and evaluating potential ambient air quality impacts from the proposed project. Pollutants exceeding standards are shown in bold.

Air Quality Table 5
Staff Recommended Background Concentrations (µg/m^3)

Pollutant	Averaging Time	Recommended Background[a]	Limiting Standard	Percent of Standard
NO_2	1 hour[b]	264.0	338	78%
	1-hour[c]	139.0	188	**74%**
	Annual	58.9	56	**105%**
CO	1 hour	9,600	23,000	42%
	8 hour	7,315	10,000	73%
PM10	24 hour	131.0	50	**262%**
	Annual	45.0	20	**225%**
PM2.5	24 hour	48.5	35	**139%**
	Annual	17.5	12	**146%**
SO_2	1 hour	107.0	655	16%
	24 hour	86.0	105	82%
	Annual	28.6	80	36%

Note: a) SCAQMD North Long Beach Ambient Air Quality Monitoring Station
b) Maximum observed 1-hour value.
c) Three-year average of 98th percentile daily maximum 1-hour values,

Source: CARB 2010b

Project Description and Proposed Emissions

The Watson Cogeneration Steam and Electric Reliability (BP Watson) Project is a proposed expansion of a steam and electrical generating (cogeneration) facility that is located in the City of Carson in Southern California. The BP Watson project will complete the original design of Watson Cogeneration Facility that has been in continuous operation for more than 20 years. The Watson Cogeneration Company (Watson) has constructed and operated four cogeneration units, since 1988, at a site within the BP Carson Refinery. Watson is a joint partnership between subsidiaries of BP America and Edison Mission Energy. The existing cogeneration facility consists of four General Electric (GE) 7EA Combustion Turbine Generators (CTG), four Heat Recovery Steam Generators (HRSG), and two steam turbine generators (STG).

The proposed BP Watson project is for a fifth cogeneration train, or “fifth train,” which includes a CTG/HRSG and air pollution control system. The new cogeneration unit would increase the electric generating capacity of the facility by approximately 85 MWe, from 385 MWe to 470 MWe. The cogeneration unit would supply electric power and steam to the refinery and would export excess power generated to the electric utility grid. It would increase the reliability of the Watson facility, reducing the risk of refinery upset due to loss of power. The BP Watson project would also ensure that the refinery’s steam demand is fully met, even when one or two of the existing CTG/HRSGs are out of service.

The BP Watson project would operate as a base loaded cogeneration unit and is proposed to be permitted for 8,760 hours of operation per year, with an expected facility capacity factor of greater than 95%. The expansion BP Watson project would consist of the following:

- Installation of a nominal 85 megawatt (MW) GE 7EA Dry Low NOx (DLN) combustion turbine with inlet fogging.
- Installation of the HRSG producing up to approximately (~) 659 Klbs steam/hr and equipped with a duct burner with up to 447.9 MMBtu/hr (high heating value [HHV]) heat input at 36oF.
- Installation of two additional cells to the existing seven cell wet cooling tower to provide cooling and heat rejection from the new power block process.
- Installation of all required auxiliary support systems, none of which are fuel burning equipment.

The BP Watson project design would incorporate air pollution emission controls designed to meet SCAQMD BACT determinations. These controls would include DLN combustors in the CTG to limit nitrogen oxide (NOx) production, Selective Catalytic Reduction (SCR) with ~~anhydrous~~ aqueous ammonia for additional NOx reduction in the HRSG, an oxidation catalyst to control carbon monoxide (CO) and volatile organic compounds (VOC) emissions [Refer to Comment 4.1.1]. Fuels to be used would be pipeline specification natural gas, refinery gas, or a mix of pipeline specification natural gas and refinery gas. Low NOx burners would be incorporated into the HRSG.

The CTG would fire a blend of natural gas and refinery fuel gas, with the refinery fuel gas accounting for up to 35 % by volume of fuel fired, while the duct burner in the HRSG is expected to fire mostly refinery gas. The refinery gas would be limited to a total sulfur concentration of 40 ppm on a rolling 3-hour averaging period and 30 ppm based on a rolling 24-hour averaging period. Hydrogen sulfide concentrations would be limited to 162 ppm based on a rolling 3-hour averaging period and 60 ppm based on a rolling 365 successive day average.

Other emission control technologies were evaluated as part of the BACT determination. Specifically, the EMx (SCONOX) Catalyst was considered as an alternative to SCR. The EMx Catalyst offers some benefits over SCR, such as avoiding the use of ammonia. However, both SCR and EMx would be expected to achieve the proposed BACT NOx emission limit of 2.0 ppmvd @ 15% O_2 averaged over one hour and neither would cause significant energy, economic, or environmental impacts. The concern remains regarding the long-term effectiveness of EMx as a control technology as the technology has not been demonstrated on the turbine used in this project over a long period of time. Since the BP Watson facility already has four identical units operating with SCR and using ~~aqueous~~ the more-concentrated anhydrous ammonia, the addition of a fifth unit using SCR with 30% aqueous ammonia would not result in the introduction of new hazards associated with SCR and aqueous ammonia and would simplify integration of the fifth unit into the existing operations.

Construction Emissions

The original design of the BP Watson facility allocated plot space for a new unit at a later date and included provisions to accommodate it. The Construction Laydown and Parking Area is a paved 25-acre parcel located approximately one mile southeast of the Project Site, at the northeast corner of East Sepulveda Boulevard and South Alameda Street. The area is owned by Watson and is currently used as a truck parking and staging area.

No off-site improvements associated with the BP Watson project, such as water supply, natural gas or wastewater pipelines, are currently planned. The BP Watson project will connect to the existing supply pipelines currently located at the facility [Refer to Comment 4.1.2]. ~~Additionally, the BP Watson project will tie in to the existing Watson Cogeneration ammonia distribution system for use in the air pollution control system.~~

Facility construction is expected to take about 20 months. The projected maximum daily and annual emissions, based on the highest monthly emissions over the entire construction period, are shown in **Air Quality Table 6**.

Air Quality Table 6
Estimated Maximum Construction Emissions (over 20 months)

	NOx	SO_2	CO	PM10	PM2.5
Maximum Daily Emissions (lb/day)	70.7	0.1	48.5	8.3	5.8
Maximum Annual Emissions (tons/project)	10.0	0.01	6.9	1.0	0.8

Source: BP Watson 2009.

The largest percentage of these construction emissions will likely occur during the first phase of project site activity, mostly due to earth moving, grading activities, large equipment operations, underground utility installation, and as building erection occurs. These types of activities require the use of large earth moving equipment, which generate considerable direct combustion emissions, along with fugitive dust emissions. The mechanical construction phase includes the installation of the heavy equipment such as the gas turbine, compressors, pumps, and associated piping. Although not a large fugitive dust generation activity, the use of large cranes to install such equipment generates significantly more direct combustion emissions than other construction equipment. Lastly, the electrical construction phase involves installation of transformers, switching gear, instrumentation, and all wiring; and is a relatively small source of emissions in comparison to the earlier construction activities.

Initial Commissioning Emissions

New power generation facilities must go through an initial firing and commissioning phase before being deemed commercially available to generate power. During this period, emissions may exceed normal operation permitted levels due to numerous startups and shutdowns, periods of low load operation, lack of pollution control equipment during test periods and other testing required before emission control systems are fine-tuned for optimum performance. Alternative and more lenient permit level emissions are used during the commissioning period.

The applicant anticipates six distinct commissioning phases (BP Watson, 2009), with a total of approximately 500 hours of operation per turbine without full emissions controls, and a further 50 hours per turbine of commissioning tuning under full emissions control. **Air Quality Table 7** presents the predicted maximum short term emissions of NOx, CO, and VOC. PM10 and SO_2 emissions are not included here since they are proportional to fuel use, and fuel use (and thus PM10 and SO_2 emissions) during commissioning is equal to or lower than during full load operations.

Air Quality Table 7
Estimated Maximum Initial Commissioning Emissions

	NOx	CO	VOC
Maximum Hourly Emissions (lb/hour)	211	255	5

Source: BP Watson, 2009, SCAQMD 2010.

Operation Emission Controls

NOx Controls

The new CTG equipment includes compressors, a combustor, and a power turbine. Natural gas from the existing Southern California Gas Company (SoCalGas) system is compressed in two new reciprocating compressors to levels required by the Dry Low NOx (DLN) combustors (350 psig at all times). The DLN combustors are expected achieve a NOx concentration of 9 ppm, corrected to 15% O2. The DLN combustors achieve this by premixing fuel and air, prior to entering the combustion chamber, thus providing greater combustion control. The CTG will also combust refinery fuel gas; the quantity dependent on the manufacturer's requirement for gas quality and how much refinery fuel gas, meeting Best Available Control Technology (BACT) standards for sulfur content, can be produced by the refinery fuel gas system.

The facility will use a Selective Catalytic Reduction (SCR) unit to control nitrogen oxides (NOx) emissions. SCR refers to a process that chemically reduces NOx to elemental nitrogen and water vapor by injecting ammonia into the flue gas stream in the presence of a catalyst and excess oxygen. The process is termed selective because the ammonia preferentially reacts with NOx rather than oxygen. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or noble metals are also used. Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream and a catalyst surface large enough to ensure sufficient time for the reaction to take place.

The SCR will utilize aqueous ammonia from a new dedicated 12,000 gallon aqueous ammonia storage tank. Based on a capacity factor of 95% and an ammonia concentration of ~~19~~ 30 wt%, the annual ammonia requirement will be ~~181,040~~114,660 gallons/yr [Refer to Comment 4.1.3]. The ammonia injection system will include a two stage ammonia air blower, vaporizer, and an ammonia injection grid to inject ammonia in front of the SCR catalyst. The air pollution control system will control pollutant emissions to the BACT level of 2.0 ppm NOx (1-hour average, corrected to 15% O2).

VOC and CO Controls

VOC and CO emissions will be controlled in the CTG combustor and by the use of an oxidation catalyst. In an oxidation catalyst system, organic compounds and CO chemically react with excess oxygen to form carbon dioxide and water. Unlike the SCR system for reducing NOx, an oxidation catalyst does not require any additional chemicals. The air pollution control system will control pollutant emissions to the following BACT levels (corrected to 15% O2): 2 ppm CO (3-hour average) and 3.0 ppm CO (1-hour average), 2 ppm VOC (1-hour average), and 5 ppm ammonia (1-hour average).

PM10 and SO_2 Controls

The use of pipeline quality natural gas, an inherently clean fuel that contains very little noncombustible solid residue and low sulfur refinery gas (less than 30 ppm total reducd sulfur) will limit the formation of SO_2 and PM10. For safety purposes, natural gas contains a small amount of a sulfur-based scenting compound known as mercaptan which produces sulfur dioxide emissions when combusted. However, in comparison to other fuels used in modern thermal power plants, such as fuel oil or coal, the amount of sulfur dioxide produced from the combustion of natural gas is very low. The SOx emissions factor for natural gas is calculated from a fuel sulfur content of 0.29 grains H_2S/100 CF and the SOx emissions factor for refinery gas is calculated from the fuel sulfur content of 30 ppm as H_2S. Resulting SOx emission factors are 0.0008 lbs/MMBtu for natural gas and 0.005 lbs/MMBtu for refinery gas.

Like SO_2, the emission level of PM10 from natural gas combustion is also very low compared to the combustion of fuel oil or coal. It is assumed in this assessment that the natural gas has a maximum short term sulfur content of 0.75 gr/100scf (grains per 100 cubic feet at standard temperature and pressure), based on Southern California Gas Company rules for pipeline quality natural gas, and an annual average sulfur content of 0.25 gr/100scf. The refinery gas has a maximum short term H2S content of 100 ppm, based on the SCAQMD permit limitations, and a 24-hour average H_2S content of 30 ppm based on a weekly gas sampling requirement at the BP Watson project. The refinery gas input to the turbine in any hour shall not exceed 35% of the total volume of gas combusted.

The Applicant proposes to mitigate PM10 emissions from the new cogeneration unit by limiting PM10 emissions from this unit and the existing four cogeneration units, to 1243 lbs/day (equal to the limit of 1244 lbs/day stated in the Energy Commission license, minus 1 lb PM10/day). As a major facility under Title V, PM10 emissions would remain within the Title V permitted limits.

The majority of the emissions from cooling tower cells are pure water vapor; however, a small amount of liquid water can escape and is known as "drift". Cooling tower drift consists of a mist of very small water droplets, which can generate particulate matter that originates from the dissolved solids in the circulating water once the water droplets evaporate. To limit these particulate emissions, cooling towers use drift eliminators to capture these water droplets, and cooling tower operators are required to monitor the total dissolved solids (TDS) in the cooling tower recirculation water to ensure that it does not exceed a SCAQMD-specified value. The applicant intends to use drift eliminators on the cooling ~~towers~~ tower cells designed to limit drift to ~~0.0005%~~0.001% of the circulating water volume per unit time [Refer to Comment 4.1.4]. Total Dissolved Solids (TDS) in the cooling tower water would be limited to 3,575 ppmw. These limits are included as part of Condition of Certification **AQ-SC10**.

Proposed Operation Emissions

The proposed maximum criteria air pollutant emissions are based entirely on vendor data for the GE 7EA turbine and the data presented in the SCAQMD Preliminary Determination of Compliance (SCAQMD 2010). **Air Quality Table 8** lists the maximum 1-hour emissions from each piece of equipment on the proposed project site assuming worst-case operating assumptions and refinery gas concentration.

Air Quality Table 8
Equipment Maximum Short-Term Emissions Rates
(pounds per hour [lb/hr], except as noted)

Process Description	NOx	SO_2	CO	VOC	PM10
CTG Cold Startup (180 minute startup, **lb/event**)	211.2	20.5	300.7	10.0	30.0
CTG Warm Startup (60 minute startup, **lb/event**)	21.3	3.2	58.7	2.6	7.2
CTG Full Load					
CTG Shutdown (60 minute shutdown, **lb/event**)	12.9	6.0	57.6	4.1	9.3
Cooling Towers (2 cells)	---	---	---	---	0.33

Source: BP Watson 2009, SCAQMD 2010.

Based on these emissions rates, the maximum possible 1-hour emissions from the project are shown in **Air Quality Table 9**. The estimated emissions for the CTG depend on the operational assumptions. For example, the NOx and VOC emissions from the CTG are a maximum during startup and operate at full load. Contrast that with the maximum for CO emissions from the CTG, which occurs during shutdown. Finally, the PM10 and SOx emissions from the CTG are at a maximum when the CTG is at full load.

Air Quality Table 9
Facility Maximum 1-hour Emissions
(pounds per hour [lb/hr])

Process Description	NOx	SO_2	CO	VOC	PM10
CTG/HRSG	175.0	5.9	210.0	4.2	9.9
Cooling Tower	---	---	---	---	0.3
Total Maximum 1-hour Emissions	175.0	5.9	210.0	4.2	10.2

Source: BP Watson 2009, SCAQMD 2010.

In general, higher emissions of NOx, VOC and CO will occur during the startup and shutdown of a large CTG than during operation because the turbine combustors are designed for maximum efficiency during full load, steady state operation. During startup, combustion temperatures and pressures change rapidly, resulting in less efficient combustion and higher emissions. Also, flue gas emission controls (the catalysts discussed above), operate most efficiently when a turbine operates at or near full load temperatures.

The maximum daily emission rates for NOx and CO were conservatively estimated as two cold startups (initial cold start failure then a restart for a total of six hours) plus 18 hours of full load operation. The maximum daily emission rates for VOC, PM10 and SO_2 were based instead on 24 hours of full load operation, since these emissions are proportional to fuel use. The total project maximum daily emissions are then conservatively estimated as the sum of the emissions from the CTG/HRSG and the cooling tower. These estimates are presented in **Air Quality Table 10** below.

The expected maximum annual emissions for the total facility are summarized in **Air Quality Table 11**. The calculations assume 8,760 hours per year and 35% refinery gas utilization. The facility annual emissions further assume 8760 hours per year the cooling tower.

Air Quality Table 10
Project Maximum Daily Emissions
(pounds per day [lb/day])

Process Description	**NOx**	**SO_2**	**CO**	**VOC**	**PM10**
CTG/HRSG [a,b]	637.4	109.0	732.2	99.8	238.3
Cooling Tower	---	---	---	---	7.9
Total Maximum Daily Emissions	637.4	109.0	732.2	99.8	246.2

[a] The worst case day for NOx and CO is defined as two cold startups (initial cold start failure then a restart for a total of six hours) plus 18 hours of full load operation.
[b] The worst case day for VOC, SO2, and PM10 is based on 24 hours of operation at full load.

Source: BP Watson 2009, SCAQMD 2010.

Air Quality Table 11
Project Maximum Annual Emissions
(tons per year [tpy])

Process Description	**NOx**	**SO_2**	**CO**	**VOC**	**PM10**
CTG/HRSG (tpy)[a]	39.9	19.9	33.1	18.2	43.5
Cooling Towers (tpy)[b]	---	---	---	---	1.45
Total Maximum Annual Emissions (tpy)	39.9	19.9	33.1	18.2	45.0

[a] Assumes CTG all Units: 2,628 hours of full load operation, 300 startups and 300 shutdowns.
[b] Assumes the cooling tower operates at full load for 8760 hours per year

Source: BP Watson 2009, SCAQMD 2010.

Ammonia Emissions

To control NOx emissions from the combustion turbines, ammonia is injected into the flue gas stream as part of the SCR system. In the presence of the catalyst, the ammonia and NOx react to form harmless elemental nitrogen and water vapor. However, not all of the ammonia reacts with the flue gases to reduce NOx; a portion of the ammonia passes through the SCR and is emitted unaltered from the stacks. These ammonia emissions are known as ammonia slip. It should be noted that a maximum permitted ammonia slip rate only occurs after significant degradation of the SCR catalyst, usually five years or more after commencing operations. At that point, the SCR catalysts are removed and replaced with new catalysts. During the majority of the operational life of the SCR system, actual ammonia slip will be at 10 to 50% of the permitted limit. The applicant proposes an ammonia emission limit of five ppm at 15% oxygen averaged over one hour. This is consistent with emissions levels used in other projects with heat recovery steam generators and is agreed to by staff.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Energy Commission staff assesses four kinds of primary and secondary impacts: construction, operation, closure and decommissioning, and cumulative. Construction impacts result from the onsite and offsite emissions occurring during site preparation and construction of the proposed project. Operational impacts result from the emissions of the proposed project during operation, which includes all applicable new onsite auxiliary equipment emissions, and the offsite employee and material delivery trip emissions. Closure and decommissioning impacts occur from the onsite and offsite emissions that would result from dismantling the facility and restoring the site. Cumulative impacts result from the proposed project's incremental effect, together with other closely related past, present and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project. (Pub. Resources Code § 21083; Cal. Code Regs., tit. 14, §§ 15064(h), 15065(c), 15130, and15355.)

Method and threshold for determining significance

Energy Commission staff evaluates potential impacts per Appendix G of the CEQA Guidelines (CCR 2006) as appropriate for the project. A CEQA significant adverse impact is determined if potentially significant CEQA impacts cannot be mitigated appropriately through the adoption of Conditions of Certification. Specifically, Energy Commission staff uses health-based ambient air quality standards (AAQS) established by the ARB and the U.S.EPA as a basis for determining whether a project's emissions would cause a significant adverse impact under CEQA. The standards are set at levels that include a margin of safety and are designed to adequately protect the health of all members of the public, including those most sensitive to adverse air quality impacts such as the aged, people with existing illnesses, children, and infants. Staff evaluates the potential for significant adverse air quality impacts by assessing whether the project's emissions of criteria pollutants and their precursors (NOx, VOC, PM10 and SO2) could create a new AAQS exceedance (emission concentrations above the standard), or substantially contributes to an existing AAQS exceedance.

Staff evaluates both direct and cumulative impacts. Staff would find that a project or activity would create a direct adverse impact when it causes an exceedance of an AAQS. Staff would find that a project's effects are cumulatively considerable when the project emissions in conjunction with ambient background, or in conjunction with reasonably foreseeable future projects, substantially contribute to ongoing exceedances of an AAQS. Factors considered in determining whether contributions to ongoing exceedances are substantial include:

1. the duration of the activity causing adverse air quality impacts;

2. the magnitude of the project emissions, and their contribution to the air basin's emission inventory and future emission budgets established to maintain or attain compliance with AAQS;

3. the location of the project site, i.e., whether it is located in an area with generally good air quality where non-attainment of any ambient air quality standard is primarily or solely due to pollutant transport from other air basins;

4. the meteorological conditions and timing of the project impacts, i.e., do the project's maximum modeled pollutant impacts occur when ambient concentrations are high (such as during high wind periods, or seasonally);

5. the modeling methods, and how refined or conservative the impact analysis modeling methods and assumptions were and how that may affect the determined adverse impacts;

6. the project site location and nearest receptor locations; and whether the identified adverse impacts would also occur at the maximum impacted receptor location; and,

7. potential for future cumulative impacts; and whether appropriate mitigation is being recommended to address the potential for impacts associated with likely future projects.

Direct/Indirect Impacts and Mitigation

While the emissions are the actual mass of pollutants emitted from the project, the impacts are the concentration of pollutants from the project that reach ground level. When emissions are expelled at a high temperature and velocity through the relatively tall stack, the pollutants will be significantly diluted by the time they reach ground level. The emissions from the proposed project are analyzed through the use of air dispersion models to determine the probable impacts at ground level.

Air dispersion models provide a means of predicting the location and ground level magnitude of the impacts of a new emissions source. These models consist of a complex series of mathematical equations, which are repeatedly evaluated by a computer for many different sets of ambient conditions and input parameters. The model results are often described as a maximum theoretical concentration of pollutant in the air to which people could be exposed, or units of mass per volume of air, such as micrograms per cubic meter (μg/m^3).

In general, the input parameters for the modeling include stack information (exhaust flow rate, temperature, and stack dimensions), specific turbine emission data, and meteorological data, such as wind speed, atmospheric conditions, and site elevation. For this project, the meteorological data used as inputs to the model included surface wind hourly wind speeds and directions measured at Long Beach Daugherty Field, upper air radiosonde data from Miramar Naval Air Station north of San Diego, and background criteria pollutant measurements from SCAQMD-maintained North Long Beach ambient monitoring station in the vicinity of the project site (BP Watson 2009). A receptor grid, or points where modeled concentrations will be calculated, was also placed around the facility, starting at the property boundary/fence line, and extending several miles in all directions.

The applicant used the U.S. EPA-approved American Meteorological Society/Environment Protection Agency Regulatory Model Improvement Committee Model (AERMOD), as both a screening and refined model to estimate the direct impacts of the project's NOx, PM10, CO, and SO_2 emissions resulting from project construction and operation. A description of the modeling analysis and its results are provided in the Application for Certification (AFC) (BP Watson 2009). AERMOD is a generally accepted model for this type of project, and the meteorological input data is sufficient.

Staff added the applicant's modeled impacts to the available highest ambient background concentrations recorded during the previous three years from nearby monitoring stations. Staff then compared the results with the ambient air quality standards for each respective air contaminant to determine whether the project's emission impacts would cause a new violation of the ambient air quality standards or contribute substantially to an existing violation.

Construction Impacts and Mitigation

Construction Impact Analysis

The construction air quality impact analyses prepared by the applicant considered both fugitive dust generated from the construction activity and combustion emissions produced by construction equipment. As a conservative assumption, this includes the following major sources (BP Watson 2009):

- Dust entrained during site preparation and finish grading;
- Dust entrained during onsite travel on paved and unpaved surfaces;
- Dust entrained during aggregate and soil loading and unloading operations;
- Dust caused by wind erosion of areas disturbed during construction;
- Exhaust from diesel construction equipment used for site preparation, grading, excavation, and construction;
- Exhaust from water trucks used for onsite paved and unpaved road fugitive dust

control;

- Exhaust from diesel powered welding machines, electric generator, air compressors, and water pumps;
- Exhaust from pickup trucks and diesel trucks used to transport workers and materials around the construction site;
- Exhaust from diesel trucks used to deliver concrete, fuel, and construction supplies to the site; and
- Exhaust from automobiles used by workers to commute to the construction site.

The applicant assessed the maximum 24-hour impacts using the emission rates for the month of maximum activity, and assessed the annual impacts using the average emissions for the entire construction period. They added the results of this modeling effort (shown in **Air Quality Table 12** below) to the assumed maximum background values, and compared the combined values to the most restrictive AAQS.

As the modeling results in **Air Quality Table 12** show, the project's construction emissions will not cause a new violation of the CO and SO_2 ambient air quality standards, and thus staff does not find these impacts to be significant. The applicant modeled a combination of Tier 2 and Tier 3 construction vehicle emissions and the results, as shown in **Air Quality Table 12**, indicate that construction emissions would have the potential to exceed the state NO_2 standard if emissions occurred during maximum background conditions; however, staff determined that the impacts would be less than the standard if only Tier 3 vehicles or vehicles with emissions equivalent to Tier 3 were used. Staff is calling for of Condition of Certification **AQ-SC5**, which would require Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines to reduce potential impacts to less than the state 1-hour NO_2 standard. Staff believes that the particulate emissions from the construction of the project create a potentially significant impact because they will contribute to existing violations of the annual and 24-hour average PM10 and the 24-hour federal PM2.5 AAQS. Those emissions can and should be mitigated to a level of insignificance. The NO_2 results in **Air Quality Table 12** are not in the form required to evaluate compliance with the new federal 1-hour NO_2 standard. The new federal short-term NO_2 standard is not evaluated because federal guidance has indicated that short-term construction-related activities are not applicable to the three-year average mandated by the standard.

Air Quality Table 12
Maximum Potential Construction Impacts Before Mitigation (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	90	264	354	338	**105%**
	Annual	1.5	58.9	60.4	56	**108%**
CO	1 hour	62	9,600	9662	23,000	42%
	8 hour	21	7,315	7336	10,000	73%
PM10	24 hour	4.5	131	135.5	50	**271%**

	Annual	0.39	45	45.39	20	**227%**
PM2.5	24 hour	1.5	48.5	50	35	**143%**
	Annual	0.22	17.5	17.72	12	**148%**
SO_2	1 hour	0.13	107	107.13	655	16%
	3-hour	0.08	107	107.08	1,300	8%
	24 hour	0.02	28.6	28.62	105	27%
	Annual	0.002	7	7.002	80	9%
Includes emissions due to site grading, laydown, building,						

Source: BP Watson 2009.

Construction Mitigation

<u>Applicant's Proposed Mitigation</u>

The applicant proposes a number of mitigation and emissions control measures for use during the construction of the project. The applicant specifically proposes the following measures:

- The Applicant will have an on-site construction mitigation manager who will be responsible for the implementation and compliance of the construction mitigation program. The documentation of the ongoing implementation and compliance with the proposed construction mitigations will be provided on a periodic basis.
- All unpaved roads and disturbed areas in the BP Watson project and Construction Laydown and Parking Area will be watered as frequently as necessary to control fugitive dust. The frequency of watering will be on a minimum schedule of every two hours during the daily construction activity period. Watering may be reduced or eliminated during periods of precipitation.
- On-site vehicle speeds will be limited to 5 mph on unpaved areas within the Project construction site.
- The construction site entrance will be posted with visible speed limit signs.
- All construction equipment vehicle tires will be inspected and cleaned as necessary to be free of dirt prior to leaving the construction site via paved roadways.
- Gravel ramps will be provided at the tire cleaning area.
- All unpaved exits from the construction site will be graveled or treated to reduce track-out to public roadways.
- All construction vehicles will enter the construction site through the treated entrance roadways, unless an alternative route has been provided.
- Construction areas adjacent to any paved roadway will be provided with sandbags or other similar measures as specified in the construction SWPPP to prevent runoff to roadways.
- All paved roads within the construction site will be cleaned on a periodic basis (or less during periods of precipitation), to prevent the accumulation of dirt and debris.
- The first 500 feet of any public roadway exiting the construction site will be cleaned

on a periodic basis (or less during periods of precipitation), using wet sweepers or air-filtered dry vacuum sweepers, when construction activity occurs or on any day when dirt or runoff from the construction site is visible on the public roadways.

- Any soil storage piles and/or disturbed areas that remain inactive for longer than 10 days will be covered, or shall be treated with appropriate dust suppressant compounds.
- All vehicles that are used to transport solid bulk material on public roadways and that have the potential to cause visible emissions will be covered, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to minimize fugitive dust emissions. A minimum freeboard height of 2 feet will be required on all bulk materials transport.
- Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) will be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition will remain in place until the soil is stabilized or permanently covered with vegetation.
- Disturbed areas, which are presently vegetated, will be re-vegetated as soon as practical.

To mitigate exhaust emissions from construction equipment, the Applicant is proposing the following:

- The Applicant will work with the general contractor to utilize to the extent feasible, Environmental Protection Agency (EPA)/Air Resources Board Tier 2/Tier 3 engine compliant equipment for equipment over 100 horsepower.
- Ensure periodic maintenance and inspections per the manufacturers specifications.
- Reduce idling time through equipment and construction scheduling.
- Use California low sulfur diesel fuels (<=15 ppm_w Sulfur).

Staff Proposed Mitigation

Staff agrees with the applicant's proposed mitigation measures. However, because of the predicted significant contribution to both the short- and long-term PM10 and PM2.5 problems, staff believes some additional construction mitigation measures are necessary. These additional measures are detailed below.

Staff has determined that the use of oxidizing soot filters is a viable emissions control technology for all heavy diesel powered construction equipment that does not use an ARB certified low emission diesel engine and ultra-low sulfur content diesel fuel. In addition, staff proposes that prior to the commencement of construction, the applicant provide an Air Quality Construction Mitigation Plan (AQCMP) that specifically identifies the mitigation measures that the applicant will employ to limit air quality impacts during construction. Staff includes proposed staff Conditions of Certification **AQ-SC1** through **AQ-SC5** below to implement the applicant's proposed mitigation measures and staff's additional requirements. These conditions are consistent with conditions of certification adopted in previous licensing cases similar to the BP Watson project. If the proposed project complies with these conditions, it is staff's opinion that the potential for significant air quality impact from the construction of the project is less than significant. Staff recommends that the implementation of all construction mitigation measures be managed by a single person of responsibility (and their delegates), as required in Condition of Certification **AQ-SC1**, to ensure adequate implementation of all mitigation measures.

Compliance with **AQ-SC5** would also result in substantial reductions in construction-related NOx emissions. The requirement for Tier 3 in **AQ-SC5** would substantially reduce NOx emissions over the Tier 2/3 engine combinations that formed the basis for the construction equipment emission calculations. The resulting reductions would result in peak 1-hour NO_2 impacts of 320 μg/m^3 (modeled impact plus the maximum background) that would be below the AAQS, while minimizing contributions to annual impacts.

Operation Impacts and Mitigation

While the construction and commissioning impacts are both relatively short lived, the operation impacts from the project will continue throughout the life of the facility. The operation impacts are thus subject to a more refined level of analysis. The following sections discuss the air quality impacts of project operation during normal full load conditions, including startup and shutdown events, the commissioning phase operations, and fumigation meteorological conditions.

Operation and Startup Impact Analysis

The applicant provided a refined modeling analysis (BP Watson 2009), using the AERMOD model to quantify the potential impacts of the project during both full load operation and startup conditions. The worst case (maximum) results of this modeling analysis are shown in **Air Quality Table 13**.

Air Quality Table 13
Refined Modeling Maximum Impacts During Startup and Operation (μg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	29	264	293	338	87%
	1-hour Federal	29	139	168	188	**89%**
	Annual	0.1	58.9	59	56	**105%**
CO	1 hour	31.1	9,600	9,631	23,000	42%
	8 hour	23.4	7,315	7,338	10,000	73%
PM10	24 hour	3.9	131	134.9	50	**270%**
	Annual	0.2	45	45.2	20	**226%**
PM2.5	24 hour	1.3	48.5	49.8	35	**142%**
	Annual	0.2	17.5	17.7	12	**148%**
SO_2	1 hour	0.9	107	107.9	655	16%
	3 hour	0.7	107	107.7	1,300	8%

	24 hour	0.2	28.6	28.8	105	27%
	Annual	0.1	7	0	80	0%

[a] modeled 1-hour average impacts during startup event

[b] Modeled annual operational assumptions for all emitting devices (see AIR QUALITY Table 11).

Source: BP Watson 2009

Startup impacts (NOx and CO) are much larger than full load impacts not only because the emissions are greater, but also because the flue gas stream is at a lower velocity and temperature. This reduced emissions velocity means the plume will level off at a lower height and thus have less time to dilute before reaching the ground. Note that the values presented are very conservative, based on worst case startup emission estimates in the form of vendor-guaranteed emissions rates from the turbine manufacturer. Actual startup events are likely to generate significantly fewer emissions and impacts. This analysis is additionally conservative with regard to the assumed background measurements. The assumption is that the highest background measurements from the last four years coincide (in both location and timing) with the maximum project emission impacts. Because such a high background level is unlikely to occur at the same time and location as the maximum impacts from the project, these modeled conditions are considered worst case, conservative, and not likely to occur.

The modeled impact values in **Air Quality Table 13** show that during worst case startup and full load operations, the facility will potentially contribute to the existing PM10 violations. Even without the project's contribution, background values show that violations exceed 200% of the ambient air quality standard. Staff believes that any increases constitute a significant impact if not mitigated. Staff uses the federal and state ambient air quality standards, which are health-based standards, as the indication of possible adverse ambient air quality impacts. Since the project PM10/PM2.5 emission impacts will contribute to an existing exceedance of the PM10 and PM2.5 state and federal ambient air quality standards, staff presumes that these impacts may also contribute to existing human health impacts (generally in the form of respiratory impacts). Thus, staff considers the project PM10/PM2.5 emission impacts to be significant if left unmitigated.

Since the project's impacts alone do not cause a violation of any NO_2, CO, or SO_2 ambient air quality standards under such conservative assumptions, staff concluded that the project impacts for those pollutants are insignificant. Although the direct NO_2 impacts from the BP Watson project do not cause a violation of the NO_2 ambient air quality standard, all NO_2 emissions from the facility will still need to be offset with RECLAIM Trading Credits (RTCs) to maintain district wide progress toward attainment with the ozone ambient air quality standards because NO_2 is a precursor emission to ozone formation (see Conditions of Certification **AQ-2** and **AQ-15**). Similarly, the direct SO_2 impacts from the BP Watson project, which do not cause a violation of the SO_2 ambient air quality standards, will need to be offset with RTCs to maintain district-wide progress toward attainment with the PM10 ambient air quality standards because SO_2 is a precursor pollutant to secondary PM10/PM2.5 formation. Please see the "Operations Mitigation" section below for a detailed discussion of the proposed mitigation.

Fumigation Modeling Impact Analysis

Surface air is usually stable during the early morning hours before sunrise. During such meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed and diluted. When the sun first rises, the air at ground level is heated, resulting in turbulent vertical mixing (both rising and sinking) of air within a few hundred feet of the ground. Emissions from a stack that enter this turbulent layer of air will also be vertically mixed, bringing some of those emissions down to ground level before significant dispersion occurs and possibly causing abnormally high short term impacts. As the sun continues to heat the ground, this vertical mixing layer becomes thicker over time, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 60 minutes.

The applicant used the U.S. EPA approved SCREEN3 model (version 96043) for the calculation of the project's fumigation impacts, without a shoreline assumption, since the proposed facility is a significant distance from the nearest shoreline. **Air Quality Table 14** shows the highest modeled fumigation impacts in comparison with the one-hour NO_2, SO_2 and CO standards. Since fumigation impacts will not typically occur for more than a one-hour period, only the impacts on the one-hour standards are shown. The results of the modeling analysis show that fumigation impacts will not violate any of the one-hour standards. Therefore, staff finds the potential ambient air quality fumigation impacts to be less than significant.

Air Quality Table 14
CTG/HRSG Fumigation Modeling Maximum 1 hour Impacts (µg/m^3)

Pollutant	Modeled Impact from 1 Unit	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	6.9	264	271	338	80%
NO_2	6.9	139	146	188	78%
CO	8.4	9,600	9,608	23,000	42%
SO_2	3.9	107	111	655	17%

Commissioning Phase Modeling Impact Analysis

The initial commissioning of a power plant refers to the time frame between completion of construction and the consistent production of electricity for sale on the market. Normal operating emission limits usually do not apply during initial commissioning procedures. The BP Watson project will go through several tests during initial commissioning. During the first set of tests, post-combustion controls will not be operational (i.e., the SCR and oxidation catalyst).

Initial commissioning starts with a Full-Speed, No-Load test. This test runs the turbine at approximately 20% of its maximum heat input rate. Components tested include the ignition system, synchronization with the electric generator, and the turbine-overspeed safety system. Part Load testing runs the turbines at approximately 60% of the maximum heat input rating. During this test, the turbine will be tuned. Full Load testing runs the turbines to their maximum heat input rate. This testing entails further tuning of the turbine. Full Load with partial SCR testing runs the turbines at 100% of their maximum heat input rate and operates the SCR ammonia injection grid for the first time at less than maximum injection rate. Finally, Full Load with full SCR testing runs the turbines at their maximum heat input rate and operates the SCR ammonia inject grid at its full capacity. It is during this test that the SCR system will be completely tuned and operated at design levels (i.e., NOx control at 2.0 ppm).

There is reasonable experience to draw from regarding the initial commissioning of the GE 7EA turbines. The applicant is estimating that it will need approximately 550 hours of actual turbine operation for commissioning purposes. The applicant estimates ~~that the~~ a maximum NOx emission rate ~~(~~of 211 lbs/hr~~) is most likely to occur~~ during the ~~water injection~~ commissioning phase ~~when the water injection will be 50% effective and the turbine train will be at 50% load~~. The maximum CO emission rate ~~(~~will be 255 lbs/hr~~) will most likely occur when the water injection is 100% effective and the turbine train is at 100% load (SCR and oxidation catalyst are not yet commissioned)~~ [Refer to Comment 4.1.5].

The applicant used the U.S. EPA approved AERMOD model for the calculation of commissioning impacts. **Air Quality Table 15** shows the highest modeled impacts in comparison with the one-hour NO_2 and CO standards and the 8-hour CO standard. The modeled NOx and CO emission rates presented show that there is no reasonable expectation that the emissions from initial commissioning will cause or contribute to an exceedance of the limiting ambient air quality standards.

Air Quality Table 15
CTG Commissioning Modeling
Maximum 1 hour Impacts (μg/m^3)

Pollutant	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2 State	36.6	264	301	338	89%
NO_2 Federal	36.6	139	176	188	94%
CO 1-Hour	37.3	9,600	9,637	23,000	42%
CO 8-Hour	27.8	7,315	7,343	10,000	73%

Source: BP Watson 2009.

Secondary Pollutant Impacts

The project's gaseous emissions of NOx, SO_2, VOC and ammonia can contribute to the formation of secondary pollutants: ozone and PM10/PM2.5. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the model to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, the emissions of NOx and VOC from the BP Watson project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region.

These impacts would be significant because they would contribute to ongoing violations of the state and federal ozone ambient air quality standards.

Secondary PM10 formation, which is assumed to actually consist of 100% PM2.5 for this project assessment, is the process of conversion from gaseous reactants to particulate products. The process of gas-to-particulate conversion, which occurs downwind from the point of emission, is complex and depends on many factors, including local humidity and the presence of air pollutants. The basic process assumes that the SOx and NOx emissions are converted into sulfuric acid and nitric acid first, and then react with ambient ammonia to form sulfate and nitrate. The sulfuric acid reacts with ammonia much faster than nitric acid does and converts completely to a particulate form. Nitric acid reacts with ammonia to form both a particulate and a gas phase of ammonium nitrate. The particulate phase will tend to fall out, however the gas phase can revert back to ammonia and nitric acid. Thus, under the right conditions, ammonium nitrate and nitric acid establish a balance of concentrations in the ambient air. There are two conditions that are of interest, described as “ammonia rich” and “ammonia poor.” In the case of the “ammonia rich” condition, there is more than enough ammonia in the atmosphere to react with all the sulfuric acid and to establish a nitric acid-ammonium nitrate balance. Further ammonia emissions in this case will not necessarily lead to increases in ambient PM2.5 concentrations. In the case of an “ammonia poor” environment, there is insufficient ammonia to establish a nitric acid-ammonium nitrate balance, and thus additional ammonia will tend to increase PM2.5 concentrations.

Studies of ambient air quality in the South Coast Air Basin indicate that the entire Basin is likely to be ammonia rich. The ammonia sources are primarily driven by ammonia emissions from livestock, soil (natural emissions and agricultural additives), motor vehicles and domestic emissions. These sources exist at various intensities across the basin, giving rise to the transport of ammonia (as ammonium, NH_4, which is more stable than ammonia, NH_3) throughout the basin. Since the ambient air concentrations are likely ammonia rich, further ammonia emissions from the BP Watson project might not lead to further formation of nitric and sulfuric acid, and ultimately conversion to ammonium nitrate or sulfate particulate. While there may be some conversion from the ammonia emitted from the project, the conversion rate might also be zero. Furthermore, there is currently no regulatory model that can predict the conversion rate. Therefore, staff is not able to reasonably estimate what impacts, if any, there will be from the project’s ammonia emission.

Additionally, the actual ammonia emissions from the BP Watson project will typically be approximately 10 to 50% of the ammonia limit being imposed (5 ppm at 15% O_2 averaged over one hour). The point at which the project begins to emit at greater than 50% of the limit is typically the indicator to the operator that the SCR catalyst material needs to be replaced. Once this major overhaul is completed the SCR performance is typically returned to near new levels (approximately 1 ppm or better). It is in the best interest of the project owner to perform these overhauls as required so that the cost of ammonia stays low for the project. Thus for the vast majority of the project life, the ammonia emissions are expected to be below 2 ppm. An emission of any type of pollutant at this level has a very low potential to cause a significant impact.

Staff finds that it is not reasonably possible to estimate the impacts from the BP Watson project emissions of ammonia, but that these emissions are small and well controlled so that it is reasonable to assume that they are not likely to cause or contribute to an exceedance of the PM10 or PM2.5 ambient air quality standards or that at least it is reasonably speculative. Thus, staff concludes that the BP Watson project ammonia emissions do not have the potential to cause a significant impact on the ambient air quality.

The emissions of NOx and SOx from the BP Watson project do have the potential (if left unmitigated) to contribute to higher PM2.5 levels in the region. These impacts would be significant because they would contribute to ongoing violations of the state and federal PM2.5 ambient air quality standards. The mitigation of the project NOx and SOx emissions is discussed in the Operations Mitigation section below.

Visibility Impacts

Modeling of plume visibility, as described under SCAQMD Rule 1303(b)(5)(C) is not required because the project does not result in an emissions increase of 15 tons PM10/year or 40 tons NOx/year. Further, the site location is not within the prescribed distances (28 to 32 km) of a Federal Class I Area (note: minimum distance of the BP Watson project to any of the listed Federal Class I Areas is 53 km).

Operations Mitigation

Applicant's Proposed Mitigation

The BP Watson project's air pollutant emissions impacts will be reduced by using emission control equipment on the project and by providing emission offsets. To reduce NOx emissions, the applicant proposes to use ~~water injection into the combustors in the CTGs and~~ an SCR system with an ammonia injection grid [Refer to Comment 4.1.5].

Cooling Towers

To reduce the PM10 emissions from the cooling towers, the applicant has committed to using wet, mechanical draft cooling towers with a drift eliminator rated at ~~0.0005%~~0.001% and the cooling tower's water total dissolved solids will be limited to 5,000 mg/liter. The SCAQMD does not address cooling towers in its permits to construct or operate. Thus staff proposes that the cooling tower compliance be monitored through Conditions of Certification **AQ-SC9** and **AQ-SC10,** and that mitigation measures be implemented for avoiding chronic exceedances [Refer to Comment 4.1.4].

Combustion Turbine

To reduce CO emissions, the applicant proposes to use a combination of good combustion and maintenance practices, along with an oxidizing catalyst. The use of a clean-burning fuel (natural gas) and the efficient combustion process of the CTGs will limit VOC and PM10 emissions. The use of natural gas, low sulfur refinery gas ~~and butane~~, or a blend of natural gas and refinery gas will limit SO_2 emissions [Refer to Comment 4.1.6].

Water Injection

Over the last 20 years, combustion turbine manufacturers have focused their attention on limiting the NOx formed during combustion. One method has been steam or water injected into the combustor cans to reduce combustion temperatures and the formation of thermal NOx, which is the primary source of NOx emissions from a CTG. This method has been employed for many years and is well understood and has been proposed for the GE 7EA turbines for this project [Refer to Comment 4.1.5].

Flue Gas Controls

To further reduce the emissions from the combustion turbines before they are exhausted into the atmosphere, flue gas controls, primarily catalyst systems, will be installed for the GE 7EA turbine. The applicant is proposing two catalyst systems, an SCR system to reduce NOx, and an oxidizing system to reduce CO and VOC.

Selective Catalytic Reduction (SCR)

SCR refers to a process that chemically reduces NOx by injecting ammonia into the flue gas stream over a catalyst in the presence of oxygen.

The process is termed selective because the ammonia reducing agent preferentially reacts with NOx rather than oxygen, producing inert nitrogen and water vapor. The performance and effectiveness of SCR systems are related to operating temperatures, which may vary with catalyst designs. Flue gas temperatures from a combustion turbine typically range from 950^{o} F to 1,100^{o}F.

Catalysts generally operate between 600 degrees to 750 degrees F (CARB 1992), and are normally placed inside the exhaust where the flue gas temperature has partially cooled. At temperatures lower than 600 degrees F, the ammonia reaction rate may start to decline, resulting in increasing ammonia emissions, called “ammonia slip.” At temperatures above about 800 degrees F, depending on the type of material used in the catalyst, damage to some catalysts can occur. The catalyst material most commonly used is titanium dioxide, but materials such as vanadium pentoxide, zeolite, or a noble metal are also used. These newer catalysts (versus the older alumina-based catalysts) are resistant to fuel sulfur fouling at temperatures below 770 degrees F (EPRI 1990).

Regardless of the type of catalyst used, efficient conversion of NOx to nitrogen and water vapor requires uniform mixing of ammonia into the exhaust gas stream. Also, the catalyst surface has to be large enough to ensure sufficient time for the reaction to take place.

Oxidizing Catalyst

To reduce the turbine CO and VOC emissions, the applicant proposes to install an oxidizing catalyst, which is similar in concept to catalytic converters used in automobiles. The catalyst is usually coated with a noble metal, such as platinum, which will oxidize unburned hydrocarbons and CO to water vapor and carbon dioxide (CO_2). The catalyst is proposed to limit the CO concentrations exiting the exhaust stack to two ppm, corrected to 15% excess oxygen and averaged over three-hours.

Emission Offsets

The applicant has or will secure sufficient offsets to satisfy SCAQMD Rule 1303 (which requires Emission Reduction Credits (ERCs)) and SCAQMD Regulation XX (which requires participation in the RECLAIM program), as well as to mitigate the project impacts under CEQA. **Air Quality Table 16** summarizes the applicant's proposals to offset or otherwise mitigate the BP Watson project emission impacts.

Air Quality Table 16
Operational Emission Offsets and Mitigation Proposed by the Applicant

Pollutant	Amount of Offsets Required	Offset or Other Mitigation
VOC	187 lb/day[a]	ERCs – supplied by BP Watson.
NOx	Commissioning Year RTCs – 99,850 lbs/year Other Years RTCs – 79,800 lbs/year	RTCs – supplied by BP Watson.
SOx	Commissioning Year – 31,050 lbs/year Other Years – 39,770 lbs/year	RTCs – supplied by BP Watson.
CO	None[b]	
PM10	295	Rule 1304 Exemption – Concurrent Facility Modification
PM2.5[c]	None	

[a] Includes 1.2-to-1.0 offset ratio, as per Rule 1303(b)(2)(A.)

[b] SoCAB is classified as Attainment for federal and state ambient air quality standards for CO as shown in Air Quality Table 5+2.) Therefore, no CO offsets are required. The worst case maximum yearly CO emission of 33 tons/year is below the 250 ton/year threshold for Prevention of Significant Deterioration (PSD) as specified by Rule 1701(b)(2). Therefore, BP Watson does not require a PSD permit.

[c] Assuming all (100%) of PM10 emissions are PM2.5.

The proposed criteria pollutant mitigation strategy for the BP Watson project is summarized below.

- NOx and SOx mitigation, in the form of Regional Clean Air Initiatives Market (RECLAIM Trading Credits [RTCs]) will be achieved via the RECLAIM program either through existing holdings or through purchase.
- VOC mitigation will be achieved by obtaining sufficient purchased Emission Reduction Credits (ERCs) to fully satisfy the Regulation XIII offset requirements.
- PM10 emissions from the new cogeneration unit will be addressed through adoption of an emissions limit for all five cogeneration units, which is equal to the current limit for the existing four units, minus 1 lb PM10/day. The existing CEC license limits PM10 emissions from the four existing cogeneration units to 1244 lbs/day; hence the new limit will be 1243 lbs PM10/day for all five cogeneration units. This is granted since recent source testing indicates that the actual PM10 emissions from the four existing cogeneration units are 436 lbs/day (year 2007 test) and 153 lbs/day (year 2008 test). Thus, the potential emissions of 238 lbs PM10/day from the fifth cogeneration unit should not result in exceedance of the 1,243 lbs/day limit. Proposed SCAQMD condition **AQ-1** will require the facility to calculate PM10 emissions from all five cogeneration units, based on emissions factors for natural

gas, butane and refinery gas firing (note: cogeneration units 1 through 4 are permitted to fire butane, while the fifth cogeneration unit is not permitted to fire butane). For this project, an exemption from emissions offsets under District Rule 1304, due to Concurrent Facility Modification, is claimed for PM10 emissions.

- CO offsets are not required since the air basin is in attainment.

The Regional Clean Air Incentives Market (RECLAIM) is designed to allow facilities flexibility in achieving emission reduction requirements for NOx and SOx through controls, equipment modifications, reformulated products, operational changes, shutdowns, other reasonable mitigation measures or the purchase of excess emission reduction credits. The RECLAIM program established an initial allocation (beginning in 1994) and an ending allocation (which was required to be attained by the year 2003) for each facility within the program (Rule 2002). Additional adjustments to the ending allocation were adopted in 2005. Under the program, each facility then reduces its allocation annually on a straight line from the initial to the ending allocation. The RECLAIM program supersedes other specified district rules, where there are conflicts. As a result, the RECLAIM program has its own rules for permitting, reporting, monitoring (including continuous emission monitoring (CEM)), record keeping, variances, breakdowns and the New Source Review program, which incorporates BACT requirements (Rules 2004, 2005, 2006 and 2012). RECLAIM also has its own banking rule, Rule 2007, for RECLAIM Trading Credits.

Adequacy of Proposed Mitigation

<u>Potential Mitigation for VOC, SOx, PM10 and PM2.5</u>

VOC Emissions and Offsets

The BP Watson project will comply with all of the SCAQMD's VOC offset requirements (at a 1.2-to-1.0 offset ratio) by providing VOC ERCs prior to issuance of the Permit to Construct (PTC), as specified in Rule 1303(b)(2). As shown in **Air Quality Table 19** below, Watson already controls VOC ERCs to offset 61 lbs/day of VOC emissions and will provide an additional 126 lbs/day of VOC ERCs prior to issuance of the final Title V permit to cover the maximum offset liability of 187 lbs/day of VOC emissions.

As required by PRC Code Section 25523, the Energy Commission shall require that the applicant obtain all necessary emission offsets within the time required by the applicable district rules, consistent with any applicable federal and state laws and regulations, and prior to the commencement of the operation of the proposed facility. Watson will provide the additional 126 lbs/day of VOC ERCs prior to issuance of the final Title V permit to cover the maximum offset liability of 187 lbs/day of VOC emissions. Since Watson holds 502 lb/day in VOC ERCs in the coastal zone, the BP Watson project should be able to easily obtain the necessary remaining VOC ERCs. Condition of Certification **AQ-SC7** requires these additional VOC ERCs.

Air Quality Table 19
VOC Emission Offsets and Mitigation Proposed by the Applicant

ERC Certificate No.	ERC Certificate Registered Owner	ERC Certificate Amount (lbs/day)
AQ007588	BP West Coast Prod .LLC BP Carson.	4
AQ008748	BP West Coast Prod .LLC BP Carson.	7
AQ010814	BP West Coast Prod .LLC BP Carson.	50

NOx Emissions and Offsets

The BP Watson project complies with all of the NOx offset requirements (at a 1.0-to-1.0 offset ratio) by holding sufficient NOx RTCs to offset the annual emission increase for the first year of operation prior to commencement of initial operation, as specified in Rule 2005(b)(2). The SCAQMD provides a programmatic demonstration, as approved by EPA, in March of each year in its Annual RECLAIM Audit report to the Governing Board that the 1.2 to 1 offset ratio required by federal law is met on an aggregate basis for RECLAIM new and modified sources. Watson shall also, at the commencement of each subsequent compliance year, hold NOx RTCs equal to the amount required by permit conditions, as specified in Rule 2005(f)(1).

SOx Emissions and Offsets

The BP Watson project complies with all of the SOx offset requirements (at a 1.0-to-1.0 offset ratio) by holding sufficient SOx RTCs to offset the annual emission increase for the first year of operation prior to commencement of initial operation, as specified in Rule 2005(b)(2). The SCAQMD provides a programmatic demonstration, as approved by EPA, in March of each year in its Annual RECLAIM Audit report to the Governing Board that the 1.2 to 1 offset ratio required by federal law is met on an aggregate basis for RECLAIM new and modified sources. Watson shall also, at the commencement of each subsequent compliance year, hold SOx RTCs equal to the amount required by permit conditions, as specified in Rule 2005(f)(1).

PM10 Emissions, Precursors and Offsets

The SoCAB is in attainment with both federal and state SO_2 and Sulfate ambient air quality standards, as applicable. However, SO_2 is also considered a precursor to PM10. Presently the SoCAB is still designated as “Nonattainment” with both federal and state PM10 ambient air quality standards.

As noted above, PM10 emissions from the new cogeneration unit will be addressed through adoption of an emissions limit for all five cogeneration units, which is equal to the current limit for the existing four units, minus 1 lb PM10/day. The existing Energy Commission license limits PM10 emissions from the four existing cogeneration units to 1,244 lbs/day; hence the new limit will be 1,243 lbs PM10/day for all five cogeneration units. This is granted since recent source testing indicates that the actual PM10 emissions from the four existing cogeneration units are 436 lbs/day (year 2007 test) and 153 lbs/day (year 2008 test). Thus, the potential emissions of 238 lbs PM10/day from the fifth cogeneration unit should not result in exceedance of the 1,243 lbs/day limit. Proposed SCAQMD condition **AQ-1** will require the facility to calculate PM10 emissions from all five cogeneration units, based on emissions factors for natural gas, butane and refinery gas firing (note: cogeneration units 1 through 4 are permitted to fire butane, while the fifth cogeneration unit is not permitted to fire butane). For this project, an exemption from emissions offsets under District Rule 1304, due to Concurrent Facility Modification, is claimed for PM10 emissions.

PM2.5 Emissions and Offsets

The SoCAB is classified as "Nonattainment" for federal and state ambient air quality standards for PM2.5. As with PM10, the BP Watson facility would utilize an exemption under District Rule 1304 due to Concurrent Facility Modification. Therefore, all project-related PM2.5 emissions will be offset.

Potential Mitigation for CO

The BP Watson project complies with the CO offset requirements on the basis that the SoCAB is not classified as "Nonattainment" for federal and state ambient air quality standards for CO. (SoCAB is classified as Attainment for state and federal standards.) Therefore, offsets are not required. Also, the maximum worst case yearly CO emission is 33.1 tons/year, which is below the PSD threshold of 250 tons/year.

As discussed in the Operation and Impacts section, staff believes that the project's potential impacts on the CO ambient air quality standards are not significant. Thus, staff does not recommend any further CO mitigation measures.

Quantification of Mitigation

Staff uses the 30-day average daily emission value for characterizing the project emission profile in the South Coast air basin for the purpose of quantifying offset requirements. The 30-day average is different from the estimated worst case daily emissions (**Air Quality Table 10**). For the 30-day average, the SCAQMD sums the facility emissions for the worst case month, then divides that sum by 30 (or 31 depending on the month) to obtain a 30-day average daily emissions (in units of lbs/day). This calculation methodology does result in a lower value than is presented in **Air Quality Table 10**, but it is the method by which the SCAQMD determines the required amount of offsets for each pollutant.

The ERCs (the offsets) are calculated by the SCAQMD by taking the total emissions for the year and dividing that number by 365 to create the lbs/day annual average. An annual average calculated in this method is always going to be lower than a 30-day average used by the SCAQMD from the same emitting source, since the 30-day average will capture periods when a project, such as a peaker power plant, is operated at a higher load than the annual average. Any emitting source will always have a month in which it operates more than any other month, but in an annual average this peak month is washed out over the year. Thus the lbs/day ERC calculation is more conservative than the 30-day average lbs/day project emission calculation. Therefore, for projects located in the South Coast air basin, staff uses the 30-day average lbs/day value to characterize the project emission profile when comparing it to the ERCs being offered.

The project emissions shown in **Air Quality Table 20** are calculated by the 30-day average lbs/day values shown (with the exception of NOx and SOx which are pounds per year). Staff concludes that the credits are adequate to offset the project emissions.

Air Quality Table 20
CEQA Mitigation (30-day average)

	NOx	SOx	VOC	PM10
	(lbs/year)		(lbs/day)	
Total Project Emissions[3]	79,800	39,779	156	246
Emission Reduction Credits or RECLAIM Trading Credits	99,850[1] 79,800[2]	31,050[1] 39,770[2]	187	None Required
Total Credits	99,850[1] 79,800[2]	31,050[1] 39,770[2]	187	None Required

1 First year of operation includes commissioning emission estimates and operational assumptions made in AIR QUALITY Table 11.

2 Second year (and thereafter) of operation includes the assumptions made in AIR QUALITY Table 11.

3 Total project emissions include only the emissions from non-exempted equipment. In this case it includes only the operation of the eight combustion turbines.

Staff Proposed Mitigation

Staff recommends no further mitigation at this time.

Cumulative impacts and mitigation

“Cumulative impacts” are defined as “two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts.” (CEQA Guidelines, § 15355.) A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts.” (CEQA Guidelines, § 15130(a)(1).) Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

This analysis is primarily concerned with “criteria” air pollutants. Such pollutants have impacts that are usually (though not always) cumulative in nature. Rarely will a project by itself cause a violation of a federal or state criteria pollutant standard. However, a new source of pollution may contribute to violations of criteria pollutant standards because of the existing background sources or foreseeable future projects. Air districts attempt to attain the criteria pollutant standards by adopting attainment plans, which comprise a multi-faceted programmatic approach to such attainment. Depending on the air district, these plans typically include requirements for air pollutant emission “offsets” and the use of “Best Available Control Technology” for new sources of emissions, and restrictions of emissions from existing sources of air pollution.

Much of the preceding discussion is concerned with cumulative impacts. The “Existing Ambient Air Quality” section describes the air quality background in the South Coast Air Basin, including a discussion of historic ambient levels for each of the significant criteria pollutants. The “Construction Impacts and Mitigation” section discusses the project’s contribution to the local existing background caused by project construction. This following section includes three additional analyses:

- a summary of projections for ambient criteria pollutant levels by the air district and of the air district's programmatic efforts to abate such pollution levels;
- an analysis of the project's "localized cumulative impacts"; combining the project's direct emissions with the emissions of other local major emission sources; and
- a discussion of the impacts of chemically reactive pollutants: ozone and PM2.5.

Summary of Projections

The SCAQMD is the agency with principal responsibility for analyzing and addressing cumulative air quality impacts, including the impacts of ambient ozone and particulate matter. The SCAQMD has summarized the cumulative impact of ozone and particulate matter on the air basin from the broad variety of its sources. Analyses of these cumulative impacts, as well as the measures the SCAQMD proposes to reduce impacts to air quality and public health, are summarized in three publicly available documents that the SCAQMD has adopted or will soon adopt. These adopted air quality plans are summarized below.

- **Final 2007 Air Quality Management Plan** (adopted 6/1/2007)
  Link: www.aqmd.gov/aqmp/07aqmp/index.html
- **Final 2003 Air Quality Management Plan** (adopted 12/10/1999)
  Link: www.aqmd.gov/aqmp/AQMD03AQMP.htm
- **Final Socioeconomic Report for the Final 2007 AQMP** (adopted 6/1/2007)
  Link: www.aqmd.gov/aqmp/07aqmp/07AQMP_socio.html

2007 Air Quality Management Plan

(*The following paragraphs are excerpts from the Executive Summary of the 2007 Air Quality Management Plan adopted by the SCAQMD June 1, 2007*)

The SCAQMD adopted (June 1, 2007) the 2007 Air Quality Management Plan (AQMP) primarily in response to changes in the federal Clean Air Act (CAA). The CAA requires an 8-hour ozone non-attainment area to prepare a State Implementation Plan (SIP) revision by June of 2007 (which has been completed) and a PM2.5 non-attainment area to submit a SIP revision by late 2007 (which has been completed). The SCAQMD has decided that it is most prudent to prepare a single comprehensive and integrated SIP revision that satisfies both the ozone and PM2.5 requirements. Additionally, the U.S. EPA requires that transportation conformity budgets be established based on the most recent planning assumptions and approved motor vehicle emission model. The AQMP is based on assumptions provided by both the California Air Resources Board (CARB) and the Southern California Association of Governments (SCAG) reflecting their upcoming model (EMFAC) for motor vehicle emissions and demographic updates.

The AQMP relies on a comprehensive and integrated control approach to achieve the PM2.5 standard by 2015 through implementation of short-term and midterm control measures and achieve the 8-hour ozone standard by 2021/2024 based on implementation of additional long-term measures. In order to demonstrate attainment by the prescribed deadlines, emission reductions needed for attainment must be in place by 2014 and 2020/2023 timeframe.

Since PM2.5 in the Basin is overwhelmingly formed secondarily, the overall draft control strategy focuses on reducing precursor emission of SOx, directly-emitted PM2.5, NOx, and VOC instead of fugitive dust. Based on the District's modeling sensitivity analysis, SOx reductions, followed by directly-emitted PM2.5 and NOx reductions, provide the greatest benefits in terms of reducing the ambient PM2.5 concentrations. While VOC reductions are less critical to overall reductions in PM2.5 air quality, they are heavily relied upon for meeting the 8-hour ozone standard. SOx is also the only pollutant that is projected to grow in the future, due to ship emissions at the ports, requiring significant controls.

Directly-emitted PM2.5 emission reductions from ongoing diesel toxic reduction programs and from the short-term and mid-term control measures are also incorporated into the AQMP. NOx reductions primarily based on mobile source control strategies (e.g., add-on control devices, alternative fuels, fleet modernization, repowers, retrofits) are also relied upon for attainment. Adequate VOC controls need to be in place in time for achieving significant VOC reductions needed for the 8-hour ozone standard by 2021/2024. Reducing VOC emissions in early years would also ensure continued progress in reducing the ambient ozone concentrations. The 8-hour ozone control strategy relies on the implementation of the PM2.5 control strategy augmented with additional long-term VOC and NOx reductions for meeting the standard by 2020/2023 timeframe. With respect to PM10, since the Basin did not attain the annual standard by 2006, additional local programs are proposed to address the attainment issue in an expeditious manner.

The AQMP control measures consist of three components: 1) the District's Stationary and Mobile Source Control Measures; 2) State and Federal Control Measures recommended by CARB and/or SCAQMD staff; and 3) Regional Transportation Strategy and Control Measures provided by SCAG.

The SCAQMD control strategy for stationary and mobile sources is based on the following approaches: 1) facility modernization; 2) energy efficiency and conservation; 3) good management practices; 4) market incentives/compliance flexibility; 5) area source programs; 6) emission growth management; and 7) mobile source programs. The AQMP also includes SCAQMD staff's recommended State and federal stationary and mobile source control measures since ARB has only developed an overview of a possible control strategy for PM2.5.

The measures, prepared by SCAQMD staff and recommended for CARB's consideration for inclusion into the final AQMP, include strategies such as Smog Check Program enhancements, extensive fleet modernization of on-road heavy-duty diesel vehicles and off-road diesel equipment, accelerated penetration of advanced technology vehicles, low sulfur fuel for marine engines, accelerated turn-over of high-emitting off-road engines, and gasoline and diesel fuel reformulations.

Finally, the emission benefits associated with the 2004 Regional Transportation Plan and the 2006 Regional Transportation Improvement Program are also reflected in the AQMP.

In order to achieve necessary reductions for meeting air quality standards, all four agencies (i.e., SCAQMD, ARB, U.S. EPA, and SCAG) would have to aggressively develop and implement control strategies through their respective plans, regulations, and alternative approaches for pollution sources within their primary jurisdiction. Even though SCAG does not have direct authority over mobile source emissions, it will commit to the emission reductions associated with implementation of the 2004 Regional Transportation Plan and 2006 Regional Transportation Improvement Program which are imbedded in the emission projections. Similarly, the Ports of Los Angeles and Long Beach have authority they must utilize to assist in the implementation of various strategies if the region is to attain clean air by federal deadlines. **Air Quality Table 21** shows the areas of jurisdiction for each agency.

Although the SCAQMD has completely met its obligations under the 2003 AQMP and stationary sources subject to the District's jurisdiction account for only 11% of NOx and 24% of SOx emissions in the Basin in 2014, the AQMP contains several short-term and mid-term control measures aimed at achieving further NOx and SOx reductions (as well as VOC and PM2.5 reductions) from these already regulated sources.

Air Quality Table 21
Regulatory Agency Attainment Responsibilities and Jurisdiction

Agency	**Jurisdiction**
U.S. EPA	Forty-nine state mobile vehicle emission standards. Airplanes, trains, and ships. New off-road construction & farm equipment below 175 hp.
ARB	On-road/Off-road vehicles. Motor vehicle fuels. Consumer products.
SCAQMD	Stationary (e.g., industrial/commercial) and area sources. Indirect sources. Some mobile sources (e.g., visible emissions and use regulations from trains and ships).
SCAG	AQMP conformity assessment. Regional Transportation Improvement Program. Transportation Control Measures.
Local Government/CTCs	Transportation and local government actions (i.e., land use approvals & ports). Transportation facilities.

These strategies are based on facility modernization, energy conservation measures and more stringent requirements for existing equipment (e.g., space heaters, ovens, dryers, furnaces). In addition to short-term and mid-term control measures, the SCAQMD is also committing to long-term VOC reductions of 32 tons per day by 2020 for the 8-hour ozone attainment.

Clean air for this region requires CARB to aggressively pursue reductions and strategies for on-road and off-road mobile sources and consumer products. In addition, considering the significant contribution of federal sources such as marine vessels, locomotives, and aircraft in the Basin (i.e., 72% of SOx and 34% of NOx), it is imperative that the U.S. EPA pursue and develop regulations for new and existing federal sources to ensure that these sources contribute their fair share of reductions toward attainment of the federal standards. Unfortunately, regulation of these emission sources has not kept pace with other source categories and as a result, these sources are projected to represent a significant and growing portion of emissions in the Basin. Without a collaborative and serious effort among all agencies, attainment of the federal standards would be seriously jeopardized.

Final 2003 Air Quality Management Plan

(*The following are excerpts from the 2003 Air Quality Management Plan adopted by the SCAQMD December 10, 1999*)

The SCAQMD amended the 1997 Air Quality Management Plan (AQMP) in 1999 to address the U.S. EPA's proposed disapproval of the 1997 Ozone SIP revision to ensure that the 1997 AQMP complied with or exceeded federal requirements. The 1999 AQMP amendments to the 1997 AQMP were subsequently approved by the U.S. EPA into the SIP in April 2000. The SCAQMD updated the PM10 portion of the 1997 AQMP for both the South Coast Air Basin and Coachella Valley in 2002 as part of the District's request to extend the PM10 attainment date from 2001 to 2006 for these areas as allowed under the federal Clean Air Act (CAA). The U.S. EPA approved the 2002 update on April 18, 2003.

The purpose of the 2003 Revision to the Air Quality Management Plan for the South Coast Air Basin (Basin) and those portions of the Salton Sea Air Basin under SCAQMD jurisdiction are to set forth a comprehensive program that will lead these areas into compliance with all federal and state air quality planning requirements. Specifically, the 2003 AQMP Revision is designed to satisfy the California Clean Air Act (CCAA) tri-annual update requirements and fulfill the District's commitment to update transportation emission budgets based on the latest approved motor vehicle emissions model and planning assumptions. The Plan will be submitted to U.S. EPA as a SIP revision once it is approved by the SCAQMD Governing Board and the California Air Resources Board (CARB).

The 2003 AQMP sets forth programs which require the cooperation of all levels of government: local, regional, state, and federal. Each level is represented in the Plan by the appropriate agency or jurisdiction that has the authority over specific emissions sources. Accordingly, each agency or jurisdiction is associated with specific planning and implementation responsibilities.

At the federal level, the U.S. EPA is charged with regulation of 49-state on-road motor vehicle standards; trains, airplanes, and ships; and non-road engines less than 175 horsepower. The CARB, representing the state level, also oversees on-road vehicle emission standards, fuel specifications, some off-road sources and consumer product standards. At the regional level, the SCAQMD is responsible for stationary sources and some mobile sources. In addition, the SCAQMD has lead responsibility for the development and adoption of the Plan. Lastly, at the local level, Associations of Governments have a dual role of leader and coordinator. In their leadership role, they, in cooperation with local jurisdictions and sub-regional associations, develop strategies for these jurisdictions to implement; as a coordinator, they facilitate the implementation of these strategies. For the South Coast Air Basin, the Southern California Association of Governments is the District's major partner in the preparation of the AQMP. Interagency commitment and cooperation are the keys to success of the AQMP.

Since air pollution physically transcends city and county boundaries, it is a regional problem. No one agency can design or implement the Plan alone and the strategies in the Plan reflect this fact.

Past air quality programs have been effective in improving the Basin's air quality.

Ozone levels have been reduced by half over the past 30 years, nitrogen dioxide, sulfur dioxide, and lead standards have been met, and other criteria pollutant concentrations have significantly declined. The federal and state CO standards were also met as of the end of 2002. However, the Basin still experiences exceedances of health-based standards for ozone and particulate matter less than ten microns in size (PM10).

Progress in implementing the 1997/1999 SIPs can be measured by the number of control measures that have been adopted as rules and the resulting tons of pollutants targeted for reduction. Emission reduction commitments and reductions achieved in 2010 are based on the emissions inventory from the 1997 SIP. Since October 1999, sixteen control measures or rules have been adopted or amended by the SCAQMD through October 2002. The primary focus of the District's efforts had been the adoption and implementation of VOC control measures. The SCAQMD has achieved 158 tons per day VOC reductions, exceeding its 1997/1999 SIP commitment by approximately 44.5 tons per day.

To date, ARB has committed to VOC and NOx emission reductions of approximately 90 and 106 tons per day, respectively, and has achieved 67 and 140 tons per day, respectively. While exceeding its NOx target by 34 tons per day, ARB fell short of the VOC target by 21 tons per day using the 1997 SIP currency. U.S. EPA was obligated to VOC and NOx emission reductions of approximately 35 and 75 tons per day, respectively, and has achieved 38 and 63 tons per day, respectively.

Final Socioeconomic Report for the Final 2007 AQMP

(*The following are excerpts from the Final Socioeconomic Report for the Final 2007*

AQMP adopted by the SCAQMD June, 2007)

The 2007 Air Quality Management Plan (AQMP or Plan) has been prepared to meet the challenge of achieving healthful air quality in the South Coast Air Basin (Basin) and the Coachella Valley. This report accompanies the 2007 AQMP and presents the potential socioeconomic impacts resulting from implementation of the Plan. The information contained herein is considered by the South Coast Air Quality Management District (District) Governing Board when taking action on the Plan.

The Plan contains several short- and long-term measures designed to achieve federal ambient air quality standards, make progress toward state air quality standards, and meet air quality planning requirements. These measures will be implemented by the District, the California Air Resources Board (CARB), the U.S. Environmental Protection Agency (EPA), the Southern California Association of Governments (SCAG), and other local and regional governments. Implementation of these control strategies will affect the region's economy. This plan relies heavily on mobile source strategies, such as accelerated fleet turnover.

The District relies on a number of methods, tools, and data sources to assess the impact of proposed control strategies on the economy. These tools include the following: air quality models and concentration-response relationships to estimate benefits of clean air; capital, operating and maintenance expenditures on control devices and emission reductions to assess the cost of the Plan; the REMI (Regional Economic Models, Inc.) model to assess potential employment and other socioeconomic impacts (e.g., population and competitiveness); 2000 Census data to assess employment impacts among ethnic groups; and the Consumer Expenditure Survey from the Bureau of Labor Statistics to examine the impact of changes in product prices on consumer price indexes by household income.

Over the years, there has been an overall trend of steady improvement in air quality in the Basin. Additional emission reductions are still needed in order to bring the Basin into compliance with federal air quality standards. The benefits of better air quality through implementation of the 2007 AQMP include reductions in morbidity and mortality, increases in crop yields, visibility improvements, reduced expenditures on refurbishing building surfaces, and reduced traffic congestion.

The 2007 Plan is projected to comply with the federal PM2.5 and ozone standards with a quantified average annual benefit of $14.6 billion between 2007 and 2025. The $14.6 billion includes approximately $9.8 billion for averted illness and higher survival rates, $3.6 billion for visibility improvements, $966 million for congestion relief, $204 million for reduced damage to materials, and $18 million for increased crop yields.

The total benefit of the Plan is expected to exceed the analyzed $14.6 billion annually since not all of the benefits associated with the implementation of the Plan can be quantified. For example, the quantified health benefits only account for reduced exposure from PM2.5 and ozone, while those from decreased exposure to other pollutants are not included. In addition, reductions in vehicle hours traveled for personal trips and damages to plants, livestock, and forests have not been quantified. Further research is needed before these benefits can be quantified.

The projected annual average implementation cost of the Plan is $2.3 billion between 2007 and 2025. The cost for implementing the Plan was estimated for both quantified and unquantified measures.

The projected cost for 33 quantified short-term measures is approximately $1.8 billion per year. Transportation control measures alone account for 24% of the total quantified cost. The cost of unquantified measures is projected to be approximately $523 million per year. The cost of unquantified measures, mostly long-term measures, was derived from emission reductions as they are implemented and the average cost effectiveness of quantified measures.

The cost of quantified measures represents 47% of total emission reductions needed for attainment. A sensitivity test performed for the unquantified measures shows that their cost could vary from a low of $21 million to a high of $1.1 billion. Thus, the total annual average cost of the Plan could range from a low of $1.8 to a high of $2.8 billion. Additional efforts will be made to better quantify and/or refine the costs associated with all control measures during rulemaking or before the next AQMP revision.

Implementation of the 2007 AQMP is projected to result in air quality improvements sufficient to attain the federal air quality standards in 2014 for PM2.5 and in 2023 for ozone. The eastern and western portions of Los Angeles County and the Chino-Redlands area are projected to have the highest shares of quantified air quality benefits. Central and Eastern Los Angeles County and the Chino-Redlands area of San Bernardino County would benefit the most from reductions in PM2.5. The northern and coastal portions of Los Angeles County, Southern Orange County, and Riverside and San Bernardino Counties will benefit from reductions in ozone.

When combined PM2.5 and ozone improvements are considered, communities throughout the region will experience net air quality benefits. The 2007 AQMP is designed to meet both federal ozone and PM2.5 standards. PM2.5 has significant mortality impacts and the Basin has a deadline for attainment of the PM2.5 standard in 2014. Ozone has health impacts, including mortality, but current ozone levels do not cause as many premature deaths as PM2.5. Significant NOx reductions are necessary and they are more effective than VOC reductions to attain the PM2.5 standard in 2014. Built upon the PM2.5 strategy, further NOx reductions are still needed even with substantial VOC reductions in order to attain the ozone standard. The NOx-heavy strategy in this Plan was chosen to meet both standards and provide greater certainty to reach attainment due to less total reductions (VOC and NOx) required. Downwind areas also benefit more from this strategy. Moreover, VOC controls at this time are less advanced than NOx controls. Under the NOx-heavy strategy, there is an environmental trade-off where some areas experience increases in ozone levels (but they still remain below the federal standard). This trade-off would occur even with a combined VOC and NOx strategy, which does not meet the air quality goals. Even though ozone increases in some areas, overall health benefits are positive for each of the 19 sub-regions because benefits from PM2.5 are much greater than any dis-benefits from ozone.

The greatest PM2.5 health benefits are in Central and Eastern Los Angeles County and the Chino-Redlands area of San Bernardino County. When compared to the ozone projections under the future baseline condition where no additional control is proposed beyond today's level, ozone concentrations in some more densely populated areas will increase under the 2007 AQMP but will still be below the federal standard in exchange for PM2.5 improvements. This is termed "dis-benefit." The overall regional population-weighted exposure shows that the magnitude of ozone dis-improvements exceeds that of improvements in 2009, 2012, and 2020, thus resulting in a net overall ozone dis-benefit (or increase in symptoms). However, there will be net ozone benefits of $1.4 billion in 2023. The northern and coastal portions of Los Angeles County, southern Orange County, and Riverside and San Bernardino Counties will benefit from reductions in ozone. These areas are dominated by either White or Hispanic residents. Currently, the worst ozone locations are in Santa Clarita and Crestline.

In order to design the most efficient path to clean air, it is imperative that an integrated plan including both PM2.5 and ozone be developed. A plan targeting only a single pollutant may jeopardize the attainment of the other pollutant.

The attainment of the ozone and PM2.5 air quality standards depends on full implementation of control measures that are proposed in the 2007 AQMP. The costs of these measures will ripple throughout various communities. Quantified control measures would impose relatively greater share of costs on the southern portion of Los Angeles County than the rest of the communities. This is because of the significant costs incurred by several mobile source control measures with affected sources located around the ports of Southern Los Angeles County.

All of the 19 sub-regions are projected to have additional jobs created from cleaner air. All ethnic groups are expected to have job gains, as a result. Conversely, implementation of quantified control measures would result in jobs forgone between 2007 and 2025. Because of their large representation in today's workforce, Whites and Hispanics will be affected most by changes in jobs. However, significant uncertainty exists in projecting the job distribution by race and ethnicity due to the rapidly-changing structure of population and workforce in the four county area.

Job gains from cleaner air would benefit all five wage groups comprised of 94 occupations. Conversely, all five groups would experience jobs forgone from quantified control measures. However, there is no significant difference in impacts expected for high- versus low-paying jobs. The same is observed for impacts on the price of consumption goods from one income group to another. These findings require further evaluation during individual rule development efforts.

Localized Cumulative Impacts

Since the power plant air quality impacts can be reasonably estimated through air dispersion modeling (see Operational Modeling Analysis section) the project's contributions to localized cumulative impacts can be estimated. To represent past and, to an extent, present projects that contribute to ambient air quality conditions, the Commission staff recommends the use of ambient air quality monitoring data (see Environmental Setting section), referred to as the background. The staff undertakes the following steps to estimate what are additional appropriate present projects that are not represented in the background and reasonably foreseeable projects:

First, the Commission staff (or the applicant) works with the air district to identify all projects that have submitted, within the last year of monitoring data, new applications for an authority to construct (ATC) or permit to operate (PTO) and applications to modify an existing PTO within six miles of the project site. Beyond six miles there is little or no measurable cumulative overlap between stationary emission sources. The non-photochemical-reactant pollutant emission impacts of the criteria pollutant emissions (i.e., NOx, SOx, CO, PM10 and PM2.5) have, from staff's experience with air dispersion modeling, had a finite time and distance to remain airborne. In staff's experience of using the USEPA air dispersion models (SCREEN, ISCST3 and AERMOD), staff has never seen any proposed power plant having non-photochemical-reactant pollutant emission impacts which approach or go beyond 10 kilometers (or six miles). This effectively identifies all new emissions that emanate from a single point (e.g., a smoke stack), referred to as "point sources." The submittal of an air district application is a reasonable demarcation of what is "reasonably foreseeable". So, as an example, if the last year of ambient air quality monitoring data from area monitoring stations was 2009, then Commission staff (or the applicant) would ask the air district for all new applications that are not included in the ambient data.

Second, the Energy Commission staff (or the applicant) works with the air district and local counties to identify any new area sources within six miles of the project site. As opposed to point sources, area sources include sources like agricultural fields, residential developments or other such sources that do not have a distinct point of emission. New area sources are typically identified through draft or final Environmental Impact Reports (EIR) that are prepared for those sources. The initiation of the EIR process is a reasonable basis on which to determine what is "reasonably foreseeable" for new area sources.

The data submitted, or generated from the applications with the air district for point sources or initiating the EIR process for area sources provides enough information to include these new emission sources in air dispersion modeling. Thus, the next step is to review the available EIR(s) and permit application(s), determine what sources must be modeled and how they must be modeled.

Sources that are not new, but may not be represented in ambient air quality monitoring are also identified and included in the analysis. These sources are rare but include existing sources that are co-located with the proposed source (such as an existing power plant). In most cases, the ambient air quality measurements are not recorded close to the proposed project, thus a local major source might not be well represented by the background air monitoring. When these sources are included, it is typically a result of there being an existing source on the project site and the ambient air quality monitoring station being more than 2 miles away.

When there are a large number of sources (in some cases 15 to 20 sources) and they are primarily of small emission quantities with higher impacts, the modeling results must be carefully interpreted so that they are not skewed towards the smaller, high-impacting sources. The reason being that while small sources can cause higher impacts, they are typically limited to within a hundred yards or similar close proximity of the source. Therefore, a cumulative interaction with the proposed project emission impacts is unlikely.

Once the modeling results are produced, they are added to the background ambient air quality monitoring data and thus the modeling portion of the cumulative assessment is complete. Due to the use of air dispersion modeling programs in staff's cumulative impacts analysis, the applicant must submit a modeling protocol, based on informational requirements for an application, prior to beginning the investigation of the sources to be modeled in the cumulative analysis. The modeling protocol is typically reviewed, commented on, and eventually approved in the Data Adequacy phase of the licensing procedure. Staff typically assists the applicant in finding sources (as described above), characterizing those sources and interpreting the results of the modeling. However, the actual modeling runs are usually left to the applicant to complete. There are several reasons for this; modeling analyses take time to perform and require significant expertise, the applicant has already performed a modeling analysis of the project alone (see Operational Modeling Analysis section), and the applicant can act on its own to modify the project as the results warrant. Once the cumulative project emission impacts are determined, the necessity to mitigate the project emissions can be evaluated, and the mitigation itself can be proposed by staff and/or applicant (see Mitigation section).

The primary sources that would have the potential to result in cumulative impacts are the existing four cogeneration units that are covered by the existing Energy Commission license and SCAQMD Title V permit. Cumulative modeling was conducted to evaluate potential air quality impacts from the five cogeneration units as presented in **Air Quality Table 22**. Cumulative impacts are generally quite similar to the worst-case modeling for the proposed new cogeneration unit since worst-case impacts are based on startup conditions and only one unit can start on any given day.

Air Quality Table 22
Refined Modeling Maximum Impacts During Startup and Operation (µg/m^3)

Pollutant	Averaging Time	Modeled Impact	Background	Total Impact	Limiting Standard	Percent of Standard
NO_2	1 hour	29	264	293	338	87%
	Annual	0.6	59	60	56	**106%**
CO	1 hour	31.1	9,600	9,631	23000	42%
	8 hour	23.4	7,315	7,338	10000	73%
PM10	24 hour	3.9	131	135	50	**270%**
	Annual	0.3	45	45	20	**227%**
PM2.5	24 hour	1.5	49	50	35	**143%**

	Annual	0.3	18	18	12	**148%**
SO_2	1 hour	2.2	107	109	655	17%
	3 hour	1.8	86	88	1300	7%
	24 hour	0.6	29	29	105	28%
	Annual	0.2	7	7	80	9%
[a] modeled 1-hour average impacts during startup event [b] Modeled annual operational assumptions for all emitting devices (see AIR QUALITY Table 11).						

Source: BP Watson 2009

Chemically Reactive Pollutant Impacts

The project's gaseous emissions of NOx, SO_2, VOC and ammonia can contribute to the formation of secondary pollutants: ozone and PM10/PM2.5.

Ozone Impacts

There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NOx and VOC emissions to ozone formation, the emissions of NOx and VOC from the BP Watson project do have the potential (if left unmitigated) to contribute to higher ozone levels in the region. These impacts could be cumulatively significant because they would contribute to ongoing violations of the state and federal ozone ambient air quality standards. However, emission offsets that would be provided by Watson would reduce potential impacts to a level that would be cumulatively less than significant.

PM2.5 Impacts

The emissions of NOx and SOx from the BP Watson project do have the potential (if left unmitigated) to cumulatively contribute to higher PM2.5 levels in the region. These impacts could be considered significant because they would contribute to ongoing violations of the state and federal PM2.5 ambient air quality standards. However, emission offsets that would be provided by Watson would reduce potential impacts to a level that would be cumulatively less than significant.

COMPLIANCE WITH LORS

FEDERAL

The Prevention of Significant Deterioration (PSD) program requires major sources to obtain permits for emissions of attainment pollutants. A major source for a simple-cycle combustion turbine is defined as one whose emissions of attainment pollutants exceed 250 tons per year. Since the emissions of attainment pollutants from the BP Watson project are not expected to exceed 250 tons per year, the PSD program does not apply. Thus the SCAQMD did not issue a PSD permit as part of their Preliminary

Determination of Compliance (PDOC) for the project.

However, new PSD requirements for greenhouse gas emissions become effective January 2, 2011 for facilities which exceed emissions thresholds for traditional PSD emissions categories and July 1, 2011 for facilities with the potential to emit greenhouse gas emissions in excess of 75,000 tons of carbon dioxide-equivalent emissions per year. Watson would exceed this limit, according to **Greenhouse Gas Table 3** in the Air Quality Appendix Air-1. If the final permit for this facility is granted after this date, additional PSD requirements may apply.

STATE

The applicant will demonstrate that the project will comply with Section 41700 of the California State Health and Safety Code, which restricts emissions that would cause nuisance or injury, with the SCAQMD PDOC (issued October 12, 2010) and the Energy Commission staff's affirmative finding for the project. The project would also comply with Sections 21080, 39619.8, as noted in the SCAQMD PDOC (SCAQMD 2010).

LOCAL

Compliance with specific SCAQMD rules and regulations is discussed below via excerpts from the PDOC (SCAQMD 2010). For a more detailed discussion of the compliance of the project, please refer to the PDOC (SCAQMD 2010).

SCAQMD Regulation II-Permits

RULE 212-Standards for Approving Permits

Rule 212 requires that a person shall not build, erect, install, alter, or replace any equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants without first obtaining written authorization for such construction from the Executive Officer. A public notice will be issued followed by a 30-day public comment period prior to issuance of a permit. Compliance is expected.

RULE 218-Continuous Emission Monitoring

Under this rule, the facility is required to install, operate, and maintain in good working order a certified Continuous Emissions Monitoring System (CEMS) for CO. A facility is required to submit an "Application for CEMS" prior to installation of the CEMS. Within 90 days of installation, CEMS certification testing must be undertaken. Data from such tests must be submitted to the SCAQMD within 45 day. If results of testing are found to be satisfactory, the SCAQMD grants final approval of the CEMS. Submission of a CEMS QA/QC Plan within 45 days of installation and no later than 30 days prior to certification is also required. Reporting requirements include submittal to the SCAQMD of CEMS data every six months, reporting of concentrations and/or mass emissions in excess of regulatory limit, and reporting of breakdown or failure of the CEMS. The CO CEMS serving the new cogeneration unit, will be installed and operated in accordance with the requirements of this rule.

SCAQMD Regulation IV-Prohibitions

RULE 401-Visible Emissions

This rule limits visible emissions to an opacity of less than 20% (Ringlemann No.1), as published by the United States Bureau of Mines. It is unlikely, with the use of the SCR /CO catalyst configuration that there will be visible emissions. Compliance is expected.

RULE 402-Nuisance

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property. Compliance is expected.

RULE 403-Fugitive Dust

The purpose of this rule is to reduce the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions. The provisions of this rule apply to any activity or man-made condition capable of generating fugitive dust such as construction activities. This rule prohibits emissions of fugitive dust beyond the property line of the emission source. The applicant will be taking steps to prevent and/or reduce or mitigate fugitive dust emissions from the project site. Such measures include covering loose material on haul vehicles, watering, and using chemical stabilizers when necessary. The installation and operation of the CTGs is expected to comply with this rule.

RULE 404-Particulate Matter Concentration

This rule states limitations of particulate matter concentration as a function of stack flow rate. However, per section 404(c), this rule does not apply to emissions from combustion of gaseous or liquid fuels in steam generators or gas turbines

RULE 407-Liquid and Gaseous Air Contaminants

This rule states limits for a pollutant source of 2000 ppm CO (by volume on a dry basis averaged over 15 minutes) and 500 ppm SO_2 (averaged over 15 minutes). However, as stated in Rule 2001(j), the SOx limitation under Rule 407 is not applicable to sources regulated under the SCAQMD SOx RECLAIM program. Cogeneration Unit Nos. 1 through 4 and the proposed fifth cogeneration unit are designated “Major Sources” of SOx under RECLAIM. The new cogeneration unit will be equipped with a CO oxidation catalyst, which will control the CO to a maximum of 2 ppm @ 15% O_2 (3-hour average) and 3 ppm @ 15% O_2 (1-hour average). The results of the 2008 source test of Cogeneration Unit Nos. 1 through 4, show that exhaust gases contain CO in the range of 1.03 ppm to 1.39 ppm (as found, dry basis) (Attachment #9 has summary tables for this source test). Compliance with the CO concentration limitation of this rule is expected.

RULE 409-Combustion Contaminants

This rule restricts the discharge of contaminants from the combustion of fuel to 0.1 grain per cubic foot of gas, calculated to 12% CO_2, averaged over 15 minutes. The equipment is expected to meet this limit.

RULE 431.1-Sulfur Content of Gaseous Fuels

The public utility supplied natural gas to be fired in the cogeneration unit is expected to be in compliance with the 16 ppm sulfur limit (calculated as H_2S) imposed by this rule. This rule also limits the sulfur content of refinery fuel gas to a maximum of 40 ppmv sulfur, as H_2S. However, since SOx emissions from the cogeneration units are subject to the SCAQMD SOx RECLAIM program, this limitation does not apply to this equipment. For the new cogeneration unit, the applicant supplied emissions factor for natural gas of 0.75 grains S/100 scf corresponds to a sulfur concentration of 12 ppm sulfur, as H_2S. Further, the applicant states that over the long term, the sulfur content of natural gas fired in the new cogeneration unit is not expected to exceed 0.29 grains/100 scf.

RULE 475-Electric Power Generating Equipment

Requirements of the rule specify that the equipment must comply with a PM10 mass emission limit of 11 lb/hr or a PM10 concentration limit of 0.01 grains/dscf. The potential-to-emit of particulate matter from the new cogeneration unit is 9.93 lbs/hr. This corresponds to a grain loading of 0.0021 grains/scf @ ~ 13.5% O2 (equal to 0.0051 grains/scf @ 3% O2) at full load operation. The results of the 2008 source test of Cogeneration Unit Nos. 1 through 4 show that exhaust gases contain particulate matter with concentrations of 0.000342 to 0.000385 grains/dscf (as found) and mass emissions rates of 1.52 to 1.65 lbs/hr (Attachment #9). Compliance with the requirements of this rule is expected and will be verified by periodic source testing.

RULE 476- Steam Generating Equipment

This rule has requirements for steam generating equipment with a heat input rating of greater than 50 MMBtu/hr. The rule limits emissions of NOx to 125 ppm @ 3% O2, for gaseous fuel fired units. Per Rule 2001(j), since the existing and new cogeneration units are subject to the SCAQMD NOx RECLAIM program, they are not subject to the NOx limit under this rule. The rule also states limits for combustion contaminants of 11 lbs/hr (mass limit) and 0.01 gr/scf @ 3% O2 (concentration limit). Compliance with this rule is achieved if either limitation is met. The potential-to-emit of particulate matter from the new cogeneration unit is 9.93 lbs/hr. This corresponds to a grain loading of 0.0021 grains/scf @ ~ 13.5% O2 (equal to 0.0051 grains/scf @ 3% O2) at full load operation (note: the HRSG – duct burner used in steam generation only contributes a fraction of the cogeneration unit PM mass emissions). The results of the 2008 source test of Cogeneration Unit Nos. 1 through 4 show that exhaust gases contain particulate matter with concentrations of 0.000342 to 0.000385 grains/dscf (as found) and mass emissions rates of 1.52 to 1.65 lbs/hr (Attachment #9). Compliance with the requirements of this rule is expected.

Regulation XIII – New Source Review

RULE 1303(a) and Rule 2005(b)(1)(A)-BACT

These rules state that the Executive Officer shall deny the Permit to Construct for any new source which results in an emission increase of any non-attainment air contaminant, any ozone depleting compound, or ammonia unless the applicant can demonstrate that BACT is employed for the new source. The applicant has provided a performance warranty which accompanied the initial application package which indicates that each GE 7EA can comply with, and for NOx, even exceed the BACT requirements. SCAQMD now considers the more restrictive 1-hour averaging times to be achieved in practice and Watson will therefore be required to comply with the 1-hour averages for NOx, CO, and VOC as opposed to the three hour as was proposed. The proposed project emission characteristics are lower than that required by BACT for the combustion turbines, therefore compliance is expected.

RULE 1303(b)(1) and Rule 2005(b)(1)(B) - Modeling

The applicant has conducted air dispersion modeling using the U.S. EPA AERMOD air dispersion model. The Tier 4 Health Risk Assessment was conducted in accordance with guidelines set forth by the California Office of Environmental Health Hazard Assessment (OEHHA) and the California Air Resources Board (CARB). The OEHHA/CARB computer program (HARP) was used to determine the health risk assessment. SCAQMD staff's review of the modeling and HRA analyses concluded that the applicant used U.S. EPA AERMOD along with the appropriate model options in the analysis for NO_2, CO, PM10, and SO_2. The applicant modeled both the cumulative and individual permit unit impacts for the project. No significant deficiencies in methodology were noted. Therefore, compliance is expected.

RULE 1303(b)(2) and Rule 2005(b)(2)-Offsets

The Applicant seeks to mitigate PM10 emissions from the new cogeneration unit through adoption of an emissions limit for all five cogeneration units, which is equal to the current limit for the existing four units, minus 1 lb PM10/day. The Energy Commission permit limits PM10 emissions from the four existing cogeneration units to 1244 lbs/day; hence the new limit will be 1243 lbs PM10/day for all five cogeneration units. This is granted since recent source testing indicates that the actual PM10 emissions from the four existing cogeneration units are 436 lbs/day (year 2007 test) and 153 lbs/day (year 2008 test). Thus, the potential emissions of 238 lbs PM10/day from the fifth cogeneration unit should not result in exceedance of the 1243 lbs/day limit. Proposed condition A63.X2 will require the facility to calculate PM10 emissions from all five cogeneration units, based on emissions factors for natural gas, butane and refinery gas firing (note: cogeneration units 1 through 4 are permitted to fire butane, while the fifth cogeneration unit is not permitted to fire butane). For this project, an exemption from emissions offsets under District Rule 1304, due to Concurrent Facility Modification, is claimed for PM10 emissions.

ROG ERCs will be provided, either through current holdings or through purchase on the open market. As shown in the Emission Calculation section of this report, the increase in ROG emissions due to the fifth cogeneration unit is 156 lbs/day (30-day average). Using an offset ratio of 1.2, ERCs accounting for 187 lbs ROG/day are required for permitting of the project. The applicant must hold these ERCs in their account prior to issuance of Permits to Construct. The facility currently holds ERCs for 61 lbs ROG/day (ERC Certificate No. AQ007588 - 4 lbs ROG/day; ERC Certificate No. AQ008748 - 7 lbs ROG/day; ERC Certificate No. AQ010814 – 50 lbs ROG/day). The facility is working with a broker to identify and to purchase the required ERCs, equal to 126 lbs ROG/day.

NOx RTCs will be allocated either through existing holdings or through purchase.

SOx RTCs will be allocated either through existing holdings or through purchase. Compliance with offset requirements of Rules 1303(b)(2) and 2005(b)(2) is expected.

CO Offsets will not be required since the District is designated as “attainment” with ambient CO standards.

RULES 1303(b)(3)-Sensitive Zone Requirements and 2005(e)-Trading Zone Restrictions

Per 1303(b)(3), a facility in zone 1 may only obtain Emissions Reduction Credits originating in zone 1, to demonstrate to the Executive Officer a net air quality benefit in the area impacted by emissions from the subject facility. BP West Coast Products LLC is in zone 1 and thus must obtain ERCs from the same zone. The SCAQMD will ensure that ERCs for the increase in VOC emissions are obtained from facilities in zone 1.

RULE 1303(b)(4)-Facility Compliance

Per 1303(b)(4), a facility must be in compliance with all applicable rules and regulations of the SCAQMD. BP West Coast Products LLC is currently in compliance with all SCAQMD rules. Under Hearing Board Case No. 5357-36, they were granted a variance from the flare gas monitoring requirements under Rule 1118. This is addressed in their Title V permit, in condition I.1.1. They have notified the Hearing Board, in a letter dated January 20, 2010, that final compliance with rule requirements has been achieved for all flares.

RULE 1303(b)(5)-Major Polluting Facilities

Rule 1303(b)(5)(A) – Alternative Analysis

The applicant is required to conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for the BP Watson project and to demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with this project. The applicant has performed a comparative evaluation of alternative sites as part of the AFC process and has concluded that the benefits of providing additional electricity and increased employment in the surrounding area will outweigh the environmental and social costs incurred in the construction and operation of the proposed facility. Compliance is expected.

Rule 1303(b)(5)(B) – Statewide Compliance

Per 1303(b)(5)(B), for a major modification at an existing major pollutant facility, the facility must demonstrate that all major sources owned or operated under common control are in compliance or on a schedule for compliance with limitations and standards of the Clean Air Act. BP West Coast Products LLC submitted to the SCAQMD, on August 25, 2006, a statement that its facilities in California are in compliance or on schedule for compliance with applicable emissions limits and standards of the Clean Air Act. Therefore, compliance is expected.

Rule 1303(b)(5)(C) – Protection of Visibility

Modeling of plume visibility, as described under 1303(b)(5)(C) is not required because the project does not result in an emissions increase of 15 tons PM10/year or 40 tons NOx/year. Further, the site location is not within the prescribed distances (28 to 32 km) of a Federal Class I Area (note: minimum distance of the BP Watson project to any of the listed Federal Class I Areas is 53 km).Compliance is expected.

Rule 1303(b)(5)(D) – Compliance through CEQA

The Energy Commission is the Lead Agency under CEQA. Since the applicant is required to receive a certification from the Energy Commission, the applicable CEQA requirements and deficiencies will be addressed. Compliance is expected.

REGULATION XVII-Prevention of Significant Deterioration

The SCAQMD Governing Board, in its action on February 7, 2003, authorized the Executive Officer, upon withdrawal of the U.S. EPA Prevention of Significant Deterioration (PSD) delegation, not to request any further delegation and to allow the U.S. EPA to terminate the SCAQMD's PSD delegation agreement and for U.S. EPA to become the permitting agency for PSD sources in the SCAQMD.

The Board determined that Regulation XVII is inactive upon U.S. EPA's withdrawal of delegation and shall remain inactive unless and until the U.S. EPA provides the SCAQMD with new delegation of authority to act either in full or on a Facility/Permit-Specific basis. The delegation was rescinded on March 3, 2003, by U.S. EPA.

The SCAQMD Governing Board in its April 1, 2005, meeting reaffirmed its previous action on February 7, 2003, to relinquish PSD analysis back to federal government and render Regulation XVII inactive unless the SCAQMD receives new delegation in part or in full from the U.S. EPA.

Based on the Governing Board's actions, this rule is ineffective and no analysis is required for any pollutant subject to federal PSD requirement. The SCAQMD has sent the applicant a notification to contact the U.S. EPA directly for applicability of PSD to the proposed project. SCAQMD sent a letter to the applicant on December 8, 2005, and instructed the applicant to contact U.S. EPA directly regarding implementation of PSD. PSD requires major sources to obtain permits for attainment pollutants. A major source for a combined-cycle combustion turbine is defined as any one pollutant exceeding 250 tons per year. Since the emissions from the BP Watson project are not expected to exceed 250 tons per year, PSD does not apply.

New PSD requirements for greenhouse gas emissions become effective January 2, 2011 for facilitates which exceed emissions thresholds for traditional PSD emissions categories and July 1, 2011 for facilities with the potential to emit greenhouse gas emissions in excess of 75,000 tons of carbon dioxide-equivalent emissions per year. The BP Watson project would exceed this limit, according to **Greenhouse Gas Table 3** in the Air Quality Appendix Air-1.

Regulation XX-RECLAIM

Rule 2005(g) – Additional Requirements

As with Rule 1303(b)(5) for the Non-RECLAIM pollutants, Watson has addressed the alternative analysis, statewide compliance, protection of visibility, and CEQA compliance requirements of this rule for NOx. These requirements are essentially the same as those found in Rule 1303(b)(5), subparts A through D for non-RECLAIM pollutants, and are summarized below. Compliance is expected.

Rule 2005(g)(1) – Statewide Compliance

Per 1303(b)(5)(B), for a major modification at an existing major pollutant facility, the facility must demonstrate that all major sources owned or operated under common control are in compliance or on a schedule for compliance with limitations and standards of the Clean Air Act. BP West Coast Products LLC submitted to the SCAQMD, on August 25, 2006, a statement that its facilities in California are in compliance or on schedule for compliance with applicable emissions limits and standards of the Clean Air Act. Therefore, compliance is expected.

Rule 2005(g)(2) – Alternative Analysis

The applicant is required to conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for the BP Watson project and to demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with this project. The applicant has performed a comparative evaluation of alternative sites as part of the AFC process and has concluded that the benefits of providing additional electricity and increased employment in the surrounding area will outweigh the environmental and social costs incurred in the construction and operation of the proposed facility. Compliance is expected.

Rule 2005(g)(3) – Compliance through CEQA

The Energy Commission is the Lead Agency under CEQA. Since the applicant is required to receive certification from the Energy Commission, the applicable CEQA requirements and deficiencies will be addressed. Compliance is expected.

Rule 2005(g)(4) – Protection of Visibility

Modeling of plume visibility, as described under 1303(b)(5)(C) is not required because the project does not result in an emissions increase of 15 tons PM10/year or 40 tons NOx/year. Further, the site location is not within the prescribed distances (28 to 32 km) of a Federal Class I Area (note: minimum distance of the BP Watson project to any of the listed Federal Class I Areas is 53 km).Compliance is expected.

Rule 2005(h) – Public Notice

Watson complied with the requirements for Public Notice found in Rule 212. Therefore compliance with Rule 2005(h) is demonstrated.

Rule 2005(i) – Rule 1401 Compliance.

Watson complied with Rule 1401 as demonstrated in the Tier 4 analysis and subsequently reviewed and found to be satisfactory by SCAQMD modeling staff. Compliance is expected.

Rule 2005(j) – Compliance with State and Federal NSR.

Watson complied with the provisions of this rule by having demonstrated compliance with SCAQMD NSR Regulations XIII and Rule 2005-NSR for RECLAIM.

REGULATION XXX – Title V

The facility is subject to Reg XXX and a Title V permit was issued on September 1, 2009. The permitting of the new CTG/HRSG is a Significant Permit Revision of the Title V permit issued to BP West Coast Products LLC. BP has submitted A/Ns 496922 and 496924 to address this permit revision. As a Significant Permit Revision, the applications are subject to a 30 day public notice and a 45 day EPA review and comment period.

Rule 3006 addresses public notice requirements. It requires that a public notice be published in a newspaper serving the county where the source is located, or that a notice be sent by mail to those who request in writing to be on a list, and any other means as determined by the Executive Officer to ensure adequate notice to the affected public. This rule requires that the notice contain the following:

i) The identity and location of the affected facility;

ii) The name and mailing address of the facility's contact person;

iii) The identity and address of the South Coast Air Quality Management District as the permitting authority processing the permit;

iv) The activity or activities involved in the permit action;

v) The emissions change involved in any permit revision;

vi) The name, address, and telephone number of a person whom interested persons may contact to review additional information including copies of the proposed permit, the application, all relevant supporting materials, including compliance documents as defined in paragraph (b)(5) of Rule 3000, and all other materials available to the Executive Officer which are relevant to the permit decision;

vii) A brief description of the public comment procedure; and,

viii) The time and place of any proposed permit hearing which may be held, or a statement of the procedure to request a proposed permit hearing if one has not already been requested.

The SCAQMD plans to meet all public notice and EPA review and comment requirements for this project. Compliance with this regulation is expected.

CONCLUSIONS

Staff finds that with the adoption of the attached conditions of certification the proposed Watson Cogeneration Steam and Electric Reliability Project (BP Watson) would comply with all applicable laws, ordinances, regulations, and standards (LORS) and would not result in any significant air quality-related impacts. Staff also finds that:

- The project would comply with applicable South Coast Air Quality Management District (SCAQMD or District) Rules and Regulations, including New Source Review (NSR) requirements (SCAQMD 2010a).
- The project would not cause new violations of any NO_2, SO_2, or CO ambient air quality standards, and therefore, the project's direct NOx, SOx and CO emission impacts are not significant.
- Without proper mitigation, the project's NOx and VOC emissions would potentially contribute to existing violations of the state's 1-hour and the federal 8-hour ozone air quality standards. Staff has determined that emission offset credits from the South Coast Air Basin would mitigate the project's contribution to ozone impacts to a level that is not cumulatively considerable (**AQ-SC7**).
- Without mitigation, the project's PM10 emissions and PM10 precursor emissions of SOx would contribute to the existing violations of the state 24-hour PM10 air quality standard. However, staff has determined that PM10 emissions would be within currently permitted levels under Title V and that SOx emission reductions credits would mitigate the project's contribution to PM10 and PM10 precursor emissions impacts to a level that is not cumulatively considerable.
- Without mitigation, the project's PM2.5 emissions and PM2.5 precursor emissions of SOx would contribute to the existing violations of the state 24-hour PM2.5 air quality standard. However, staff has determined that PM2.5 emissions would be within currently permitted levels under Title V and that SOx emission reductions credits would mitigate the project's contribution to PM2.5 and PM2.5 precursor emissions impacts to a level that is not cumulatively considerable.

Staff proposes the following conditions of certification that include the SCAQMD proposed conditions from the PDOC with appropriate staff proposed verification language for each condition.

The Staff has proposed a number of permit conditions that are in addition to the permit conditions that the SCAQMD has proposed in the PDOC. In most cases the staff proposed permit conditions deal with air quality issues that the SCAQMD is not required to address. Conditions **AQ-SC1** through **AQ-SC5** are construction-related permit conditions. Condition **AQ-SC6** deals with the administrative procedures for project modifications. Condition **AQ-SC7** is a reporting requirement for the providing of emission offsets. Condition **AQ-SC8** is a quarterly emission reporting requirement. Conditions **AQ-SC9** and **AQ-SC10** are cooling tower permit requirements. Staff proposes these conditions for the operation of the cooling towers because the SCAQMD does not consider cooling towers as permit units (see discussion of SCAQMD rule 1303(a)-BACT for Cooling Towers above), and thus they do not include permit conditions. However staff believes that they are potential sources of PM10/PM2.5, as shown in our analysis, and thus permit limits and verifications of those permit limits should be proposed. Conditions **AQ-1** through **AQ-15** are the SCAQMD permit conditions with staff proposed verification language added. Condition **AQ-2** incorporates a SCAQMD rule regarding emissions limit compliance for NOx emissions within the RECLAIM program.

PROPOSED CONDITIONS OF CERTIFICATION

The SCAQMD has a unique system of structuring and numbering their permit conditions. In order for the reader to avoid confusion between how the SCAQMD numbers their permit conditions and how the Energy Commission staff normally numbers permit conditions, the staff prepared the following table that cross references the conditions in the PDOC with the conditions presented by staff in this analysis.

Air Quality Table ~~22~~23
SCAQMD Permit Conditions with Corresponding Commission Conditions of Certification [Refer to Comment 4.1.7]

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
Combustion Turbines		
A63.12, .X1, .X2	AQ-1	Monthly and daily contaminant emission limit (PM10, CO, NOx, SOx & VOC)
S2.X1	AQ-2	Annual contaminant emissions limit (NOx).
A99.X2	AQ-3	Relief from 2.5ppm NOx limit during commissioning, startup and shut down. Commissioning, startup & shutdown time limits. Limit of number of startups per year.
A99.X3	AQ-3	Relief from 2.0 ppm CO limits during commissioning, startup and shut down. Commissioning, startup & shutdown time limits. Limit of number of startups per year.
A99.X4	AQ-3	Relief from 3.0 ppm CO limits

Air Quality Table ~~22~~23
SCAQMD Permit Conditions with Corresponding Commission Conditions of Certification [Refer to Comment 4.1.7]

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		during commissioning, startup and shut down. Commissioning, startup & shutdown time limits. Limit of number of startups per year.
A99.X5	AQ-3	NOx limit for interim time period of end of commissioning to continuous emission monitoring system (CEMS) certification, not to exceed 12 months.
A99.X6	AQ-3	SOx limit for interim time period of end of commissioning to continuous emission monitoring system (CEMS) certification, not to exceed 12 months.
A99.X7	AQ-3	SOx limit for interim time period of end of commissioning to continuous emission monitoring system (CEMS) certification, not to exceed 12 months.
A195.X1	AQ-4	NOx emission limit of 2.0 ppm @ 15% O2 averaged over 1-hour.
A248.X2	AQ-4	CO emission limit of 2.0 ppm @ 15% O2 averaged over 1-hour.
A248.X3	AQ-4	CO emission limit of 3.0 ppm @ 15% O2 averaged over 1-hour.
A248.X4	AQ-4	VOC emission limit of 2.0 ppm @ 15% O2 averaged over 1-hour.
A327.1	AQ-5	Relief from emission limits, under Rule 475; project may violate either the mass emission limit or concentration emission limit, but not both at the same time.
A433.X1	AQ-3	Emission limit during startup.
B61.X1	AQ-6	H2S concentration limit for refinery gas.
B61.X2	AQ-6	H2S concentration limit for fuel gas.
C1.X1	AQ-6	Limits the turbine firing rate to no more than 1069.9 MM Btu per

Air Quality Table ~~22~~23
SCAQMD Permit Conditions with Corresponding Commission Conditions of Certification [Refer to Comment 4.1.7]

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
		hour (non-commissioning).
C1.X2	AQ-6	Limits the duct burner firing rate to no more than 510 MM Btu per hour (non-commissioning).
D12.X1	AQ-6	Requires the installation of a fuel flow meter.
D29.X1	AQ-7	Requires source tests for specific pollutants (NOx, CO, SOx, VOC, PM10, NH3) within 180 days of initial startup.
D29.X2	AQ-8	Requires source tests for ammonia (NH3); quarterly for the first year and annually thereafter.
D29.X3	AQ-7	Requires source tests for specific pollutants (SOx and~~,~~ VOC~~,~~ ~~PM10~~) once every three years.
D29.X4	AQ-7	Requires source tests for specific pollutants (PM10) once every year~~s~~.
D82.X1	AQ-9	Requires the installation of CEMS for CO emissions.
D82.X2	AQ-9	Requires the installation of CEMS for NOx emissions.
D90.X1	AQ-9	Requires the installation of CEMS for fuel gas Total Reduced Sulfur compounds.
D90.X1	AQ-9	Requires the installation of CEMS for fuel gas H2S compounds.
H23.X1	NA	Establishes the applicability of 40CFR60 Subpart KKKK for the project contaminant NOx and SOx.
H23.X2	NA	Establishes the applicability of 40CFR60 Subpart KKKK for the project contaminant H2S.
I296.X1	AQ-15	Prohibited from operation unless the operator hold sufficient RTCs for the CTGs.
K40.X	AQ-7, -8 & -9	Source test reporting requirements.

Air Quality Table ~~22~~23
SCAQMD Permit Conditions with Corresponding Commission Conditions of Certification [Refer to Comment 4.1.7]

SCAQMD Permit Conditions	Energy Commission Condition of Certification	Condition Description
K67.X1	AQ-10	Requires record keeping of fuel use during commissioning, prior to and after CEMs certification.
I296.X1	AQ-15	Prohibited from operation unless the operator holds sufficient RTCs.
SCR/CO Catalyst		
A99.X1	AQ-11	Relief from 5ppm NH3 limit during commissioning, startup and shut down. Commissioning, startup & shutdown time limits. Limit of number of startups per year.
A195.X1	AQ-11	Establishes the 5 ppm ammonia slip limit.
~~D12.X2~~D12.X4	AQ-12	Requires a flow meter for the ammonia injection.
~~D12.X3~~D12.X2	AQ-13	Requires a temperature meter at the SCR inlet.
~~D12.X4~~D12.X3	AQ-14	Requires a pressure gauge to measure the differential pressure across the SCR grid.
D12.X5	AQ-14	Requires a pressure gauge to measure the differential pressure across the CO Catalyst grid.
Ammonia Storage Tank		
C157.X	See Hazardous Material section	Requires the installation of a pressure relief valve.
E144.X	See Hazardous Material section	Requires venting of the storage tank during filling only to the vessel from which it is being filled.
K67.2	See Hazardous Material section	Requires record keeping in the manner approved by the District Executive Officer.

Energy Commission staff understand that the site area for this project is largely paved. However, we include staff conditions normally required for undisturbed sites to maintain consistency and for any work in unpaved areas.

AQ-SC1 Air Quality Construction Mitigation Manager (AQCMM): The project owner shall designate and retain an on-site AQCMM who shall be responsible for directing and documenting compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4** and **AQ-SC5** for the entire project site ~~and linear facility~~ construction [Refer to Comments G.1 and 4.1.8]. The on-site AQCMM may delegate responsibilities to one or more AQCMM Delegates. The AQCMM and AQCMM Delegates shall have full access to all areas of construction on the project site ~~and linear facilities~~, and shall have the authority to stop any or all construction activities as warranted by applicable construction mitigation conditions. The AQCMM and AQCMM Delegates may have other responsibilities in addition to those described in this condition. The AQCMM shall not be terminated without written consent of the Compliance Project Manager (CPM).

Verification: At least 60 days prior to the start of ground disturbance, the project owner shall submit to the Energy Commission's Compliance Project Manager (CPM) for approval, the name, resume, qualifications, and contact information for the on-site AQCMM and all AQCMM Delegates. The AQCMM and all delegates must be approved by the CPM before the start of ground disturbance.

AQ-SC2 Air Quality Construction Mitigation Plan (AQCMP): The project owner shall provide an AQCMP, for approval, which details the steps that will be taken and the reporting requirements necessary to ensure compliance with Conditions of Certification **AQ-SC3**, **AQ-SC4,** and **AQ-SC5**.

Verification: At least 60 days prior to the start of any ground disturbance, the project owner shall submit the AQCMP to the CPM for approval. The AQCMP shall include effectiveness and environmental data for the proposed soil stabilizer. The CPM will notify the project owner of any necessary modifications to the plan within 30 days from the date of receipt. The AQCMP must be approved by the CPM before the start of ground disturbance.

AQ-SC3 Construction Fugitive Dust Control: The AQCMM shall submit documentation to the CPM in each Monthly Compliance Report that demonstrates compliance with the Air Quality Construction Mitigation Plan (AQCMP) mitigation measures for the purposes of minimizing fugitive dust emission creation from construction activities and preventing all fugitive dust plumes from leaving the project. The following fugitive dust mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

A. The main access roads through the facility to the power block areas will be either paved or stabilized using soil binders, or equivalent methods, to provide a stabilized surface that is similar for the purposes of dust control to paving, that may or may not include a crushed rock (gravel or similar material with fines removed) top layer, prior to initiating construction in the main power block area, and delivery areas for operations materials (chemicals, replacement parts, etc.) will be paved prior to taking initial deliveries.

B. All unpaved construction roads and unpaved operation site roads, as they are being constructed, shall be stabilized with a non-toxic soil stabilizer or soil weighting agent that can be determined to be both as efficient or more efficient for fugitive dust control as ARB approved soil stabilizers, and shall not increase any other environmental impacts including loss of vegetation to areas beyond where the soil stabilizers are being applied for dust control. All other disturbed areas in the project ~~and linear~~ construction site~~s~~ shall be watered as frequently as necessary during grading (consistent with **Biology** Conditions of Certification that address the minimization of standing water); and after active construction activities shall be stabilized with a non-toxic soil stabilizer or soil weighting agent, or alternative approved soil stabilizing methods, in order to comply with the dust mitigation objectives of Condition of Certification **AQ-SC4** [Refer to Comments G.1 and 4.1.8]. The frequency of watering can be reduced or eliminated during periods of precipitation.

C. No vehicle shall exceed 10 miles per hour on unpaved areas within the construction site, with the exception that vehicles may travel up to 25 miles per hour on stabilized unpaved roads as long as such speeds do not create visible dust emissions.

D. Visible speed limit signs shall be posted at the construction site entrances.

E. All construction equipment vehicle tires shall be inspected and washed as necessary to be cleaned free of dirt prior to entering paved roadways.

F. Gravel ramps of at least 20 feet in length must be provided at the tire washing/cleaning station.

G. All unpaved exits from the construction site shall be graveled or treated to prevent track-out to public roadways.

H. All construction vehicles shall enter the construction site through the treated entrance roadways, unless an alternative route has been submitted to and approved by the CPM.

I. Construction areas adjacent to any paved roadway below the grade of the surrounding construction area or otherwise directly impacted by sediment from site drainage shall be provided with sandbags or other equivalently effective measures to prevent run-off to roadways, or other similar run-off control measures as specified in the Storm Water Pollution Prevention Plan (SWPPP), only when such SWPPP measures are necessary so that this condition does not conflict with the requirements of the SWPPP.

J. All paved roads within the construction site shall be swept daily or as needed (less during periods of precipitation) on days when construction activity occurs to prevent the accumulation of dirt and debris.

K. At least the first 500 feet of any paved public roadway exiting the construction site or exiting other unpaved roads en route from the construction site or construction staging areas shall be swept as needed (less during periods of precipitation) on days when construction activity occurs or on any other day when dirt or runoff resulting from the construction site activities is visible on the public paved roadways.

L. All soil storage piles and disturbed areas that remain inactive for longer than 10 days shall be covered, or shall be treated with appropriate dust suppressant compounds.

M. All vehicles that are used to transport solid bulk material on public roadways and that have potential to cause visible emissions shall be provided with a cover, or the materials shall be sufficiently wetted and loaded onto the trucks in a manner to provide at least two feet of freeboard.

N. Wind erosion control techniques (such as windbreaks, water, chemical dust suppressants, and/or vegetation) shall be used on all construction areas that may be disturbed. Any windbreaks installed to comply with this condition shall remain in place until the soil is stabilized or permanently covered with vegetation.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report (**COMPLIANCE-6**) to include the following to demonstrate control of fugitive dust emissions:

A. A summary of all actions taken to maintain compliance with this condition;

B. Copies of any complaints filed with the District in relation to project construction; and

C. Any other documentation deemed necessary by the CPM or AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC4 Dust Plume Response Requirement: The AQCMM or an AQCMM Delegate shall monitor all construction activities for visible dust plumes. Observations of visible dust plumes that have the potential to be transported (A) off the project site and within 400 feet upwind of any regularly occupied structures not owned by the project owner ~~or (B) 200 feet beyond the centerline of the construction of linear facilities~~ indicate that existing mitigation measures are not resulting in effective mitigation [Refer to Comments G.1 and 4.1.8 for deleted text and Comment 4.1.9 for additional comments]. The AQCMP shall include a section detailing how the additional mitigation measures will be accomplished within the time limits specified. The AQCMM or Delegate shall implement the following procedures for additional mitigation measures in the event that such visible dust plumes are observed:

Step 1: The AQCMM or Delegate shall direct more intensive application of the existing mitigation methods within 15 minutes of making such a determination.

Step 2: The AQCMM or Delegate shall direct implementation of additional methods of dust suppression if Step 1, specified above, fails to result in adequate mitigation within 30 minutes of the original determination.

Step 3: The AQCMM or Delegate shall direct a temporary shutdown of the activity causing the emissions if Step 2, specified above, fails to result in effective mitigation within one hour of the original determination. The activity shall not restart until the AQCMM or Delegate is satisfied that appropriate additional mitigation or other site conditions have changed so that visual dust plumes will not result upon restarting the shutdown source. The owner/operator may appeal to the CPM any directive from the AQCMM or Delegate to shut down an activity, if the shutdown shall go into effect within one hour of the original determination, unless overruled by the CPM before that time.

Verification: The AQCMM shall provide the CPM a Monthly Compliance Report (**COMPLIANCE-6**) to include:

A. a summary of all actions taken to maintain compliance with this condition;

B. copies of any complaints filed with the District in relation to project construction; and

C. any other documentation deemed necessary by the CPM and AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC5 Diesel-Fueled Engine Control: The AQCMM shall submit to the CPM, in the Monthly Compliance Report, a construction mitigation report that demonstrates compliance with the AQCMP mitigation measures for purposes of controlling diesel construction-related emissions. The following off-road diesel construction equipment mitigation measures shall be included in the Air Quality Construction Mitigation Plan (AQCMP) required by **AQ-SC2**, and any deviation from the AQCMP mitigation measures shall require prior CPM notification and approval.

A. All diesel-fueled engines used in the construction of the facility shall have clearly visible tags issued by the on-site AQCMM showing that the engine meets the conditions set forth herein.

B. All construction diesel engines with a rating of 50 hp or higher shall meet, at a minimum, the Tier 3 California Emission Standards for Off-Road Compression-Ignition Engines, as specified in California Code of Regulations, Title 13, section 2423(b)(1), unless a good faith effort to the satisfaction of the CPM that is certified by the on-site AQCMM demonstrates that such engine is not available for a particular item of equipment. In the event that a Tier 3 engine is not available for any off-road equipment larger than 50 hp, that equipment shall be equipped with a Tier 2 engine, or an engine that is equipped with retrofit controls to reduce exhaust emissions of nitrogen oxides (NOx) and diesel particulate matter (DPM) to no more than Tier 2 levels unless certified by engine manufacturers or the on-site AQCMM that the use of such devices is not practical for specific engine types. For purposes of this condition, the use of such devices is “not practical” for the following, as well as other, reasons.

1. There is no available retrofit control device that has been verified by either the California Air Resources Board or U.S. Environmental Protection Agency to control the engine in question to Tier 2 equivalent emission levels and the highest level of available control using retrofit or Tier 1 engines is being used for the engine in question; or

2. The construction equipment is intended to be on site for 5 days or less.

3. The CPM may grant relief from this requirement if the AQCMM can demonstrate a good faith effort to comply with this requirement and that compliance is not practical.

C. The use of a retrofit control device may be terminated immediately, provided that the CPM is informed within 10 working days of the termination and that a replacement for the equipment item in question meeting the controls required in item “B” occurs within 10 days of termination of the use, or if the equipment would be needed to continue working at this site for more than 15 days after the use of the retrofit control device is terminated, if one of the following conditions exists :

1. The use of the retrofit control device is excessively reducing the normal availability of the construction equipment due to increased down time for maintenance, and/or reduced power output due to an excessive increase in back pressure.

2. The retrofit control device is causing or is reasonably expected to cause engine damage.

3. The retrofit control device is causing or is reasonably expected to cause a substantial risk to workers or the public.

4. Any other seriously detrimental cause which has the approval of the CPM prior to implementation of the termination.

D. All heavy earth-moving equipment and heavy duty construction-related trucks with engines meeting the requirements of (B) above shall be properly maintained and the engines tuned to the engine manufacturer’s specifications.

E. All diesel heavy construction equipment shall not idle for more than five minutes. Vehicles that need to idle as part of their normal operation (such as concrete trucks) are exempted from this requirement.

F. Construction equipment will employ electric motors when feasible.

Verification: The AQCMM shall include in the Monthly Compliance Report the following to demonstrate control of diesel construction-related emissions:

A. A summary of all actions taken to control diesel construction related emissions;

B. A list of all heavy equipment used on site during that month, including the owner of that equipment and a letter from each owner indicating that equipment has been properly maintained; and

C. Any other documentation deemed necessary by the CPM, and the AQCMM to verify compliance with this condition. Such information may be provided via electronic format or disk at the project owner's discretion.

AQ-SC6 The project owner shall provide the CPM copies of all District issued Authority-to-Construct (ATC) and Permit-to-Operate (PTO) documents for the facility. The project owner shall submit to the CPM for review and approval any modification proposed by the project owner to any project air permit. The project owner shall submit to the CPM any modification to any permit proposed by the District or U.S. Environmental Protection Agency (U.S. EPA), and any revised permit issued by the District or U.S. EPA, for the project.

Verification: The project owner shall submit any ATC, PTO, and proposed air permit modifications to the CPM within five working days of its submittal either by 1) the project owner to an agency, or 2) receipt of proposed modifications from an agency. The project owner shall submit all modified air permits to the CPM within 15 days of receipt.

AQ-SC7 The project owner shall provide emission reduction credits to offset combined-cycle turbine exhaust NOx, VOC and SOx emissions in the form and amount required by the District. RECLAIM Trading Credits (RTCs) shall be provided for NOx and SOx as is necessary to demonstrate compliance with Condition of Certification **AQ-15**.

Emission reduction credits (ERCs) shall be provided for VOC (187 lb/day, includes offset ratio of 1.2:1.0). The project owner shall surrender the ERCs for VOC from among those that are listed in the table below or a modified list, as allowed by this condition. If additional ERCs are submitted, the project owner shall submit an updated table including the additional ERCs to the CPM. The project owner shall request CPM approval for any substitutions, modifications, or additions of credits listed.

The CPM, in consultation with the District, may approve any such change to the ERC list provided that the project remains in compliance with all applicable laws, ordinances, regulations, and standards, the requested change(s) will not cause the project to result in a significant environmental impact, and the SCAQMD confirms that each requested change is consistent with applicable federal and state laws and regulations.

The project owner shall request from the SCAQMD a report of the NSR Ledger Account for the project after the SCAQMD has issued the Permit to Construct. This report is to specifically identify the ERCs used to offset the project emissions.

Certificate Number	Amount (lbs/day)	Pollutant
AQ007588	4	VOC
AQ008748	7	VOC
AQ010814	50	VOC
To be determined (TBD)	126	VOC

Verification: The project owner shall submit to the CPM the NSR Ledger Account, showing that all project offset requirements have been met, 15 days prior to initiating construction for Priority Reserve credits, and 30 days prior to turbine first fire for traditional ERCs. Prior to commencement of construction, the project owner shall obtain sufficient Reclaim Trading Credits (RTCs) to satisfy the District's requirements for the first year of operation as prescribed in Condition of Certification **AQ-15**. If the CPM approves a substitution or modification to the list of ERCs, the CPM shall file a statement of the approval with the project owner and Energy Commission's docket for Watson. The CPM shall maintain an updated list of approved ERCs for the project.

AQ-SC8 The project owner shall submit to the CPM Quarterly Operation Reports, following the end of each calendar quarter, that include operational and emissions information as necessary to demonstrate compliance with the Conditions of Certification herein. The Quarterly Operation Report will specifically note or highlight incidences of noncompliance.

Verification: The project owner shall submit the Quarterly Operation Reports to the CPM and APCO no later than 30 days following the end of each calendar quarter.

AQ-SC9 The project owner shall perform quarterly cooling tower recirculating water quality testing, or shall provide for continuous monitoring of conductivity as an indicator, for total dissolved solids content.

Verification: The project owner shall submit to the CPM cooling tower recirculating water quality tests or a summary of continuous monitoring results and daily recirculating water flow in the Quarterly Operation Report (**AQ-SC8**). If the project owner uses continuous monitoring of conductivity as an indicator for total dissolved solids content, the project owner shall submit data supporting the calibration of the conductivity meter and the correlation with total dissolved solids content at least once each year in a Quarterly Operation Report (**AQ-SC8**).

AQ-SC10 The new cooling tower cells daily PM10 emissions shall be limited to 7.92

lb/day in total for both cooling tower cells. The cooling ~~towers~~ tower cells shall be equipped with a drift eliminator to control the drift fraction to ~~0.0005%~~0.001% of the circulating water flow. Total dissolved soilds (TDS) shall be limited to 3,575 ppmw [Refer to Comment 4.1.4]. The project owner shall estimate daily PM10 emissions from the cooling towers using the water quality testing data or continuous monitoring data and daily circulating water flow data collected on a quarterly basis. Compliance with the cooling tower PM10 emission limit shall be demonstrated as follows:

PM10 = cooling water recirculation rate * total dissolved solids concentration in the blowdown water * design drift rate.

Verification: The project owner shall submit to the CPM daily cooling tower PM10 emission estimates in the Quarterly Operation Report (**AQ-SC8**).

The following Conditions of Certification incorporate District conditions as required in the Determination of Compliance. Refer to **Air Quality Table ~~22~~ 23** above to relate these conditions to the District's conditions [Refer to Comment 4.1.7].

AQ-1 The project owner shall limit the emissions from the new gas fired combustion turbine train exhaust stack as follows:

Contaminant	Emissions Limit [Refer to Comment 4.1.10]
PM10	1,243 lbs in any one ~~month~~ day (Note: this limit is based on the total combined emissions from all 5 Watson Cogeneration units)
VOC	3,095 lbs in any one month

The operator shall initially calculate the daily PM10 emissions using daily fuel use data for each combustion unit, the higher heating value of the fuel burned in each combustion unit, and the following emissions factors: 0.00393 lbs PM10 / MMBTU for Natural Gas or Butane and 0.00402 lbs PM10 / MMBTU for Refinery Gas.

The PM10 emission factor for Cogeneration Units 1, 2, 3, 4, and 5 shall be revised annually based on results of individual PM10 source tests performed as specified in permit conditions D28.1 and D29X4. The PM10 emission factor shall be calculated as the average emission rate in lb/MMBtu for all valid source test runs during each individual source test.

For Refinery Gas, the following formula should be used to calculate emissions factors, in units of lbs VOC/MMscf: 2.94E-7 x Fd-Factor x GCV_v; where the Fd-Factor is the ratio of the volume of products of combustion to the fuel heat content, in units of dscf/MMBtu, and GCV_v is gross fuel calorific value, in units of Btu/scf. Monthly averages of Fd-Factor and GCV_v for Refinery Gas shall be used in this calculation.

For the purpose of this condition, the term “normal operations” is defined as the turbine is able to supply electrical energy to the power grid.

Verification: The project owner shall submit all emission calculations, fuel use, CEM records and a summary demonstrating compliance of all emission limits stated in this Condition for approval to the CPM on a quarterly basis in the quarterly emissions report required in (**AQ-SC8**).

AQ-2 The project owner/operator shall not produce emissions of oxides of nitrogen from the facility that exceed the RECLAIM Trading Credits holdings of 39.9 tons/yr required in Condition of Certification **AQ-15** within a calendar year.

Verification: The project owner/operator shall submit to the CPM no later than 60 days following the end of each calendar year, the SCAQMD required (via Rule 2004) Quarterly Certification of Emissions (or equivalent) for each quarter and the Annual Permit Emissions Program report (or equivalent) as prescribed by the SCAQMD Executive Officer.

AQ-3 The commissioning period shall not exceed 550 hours. The time for cold startup shall not exceed 3 hours for each startup. The time for warm startup shall not exceed 1 hour. The time for shutdown shall not exceed 1 hour. The turbine shall be limited to 4 cold startups per year, 12 warm startups per year, and 16 shutdowns per year.

The 5 ppm NH_3 limit, 2 ppm NO_x emission limit 2 ppm CO emission limit, and 3 ppm CO emission limit shall not apply during commissioning, start-up, and shutdown periods.

The 44 LBS/MMCF NO_x emission limit, 0.80 LBS/MMCF SO_x emission limit and 5.07 LBS/MMCF SO_x emission limit shall only apply during the interim reporting period to report RECLAIM emissions.

The operator shall comply at all times with the 2.0 ppm 1 hour BACT limit for NO_x, except as defined in condition A99.X2, (**AQ-3,** this condition) and for the following operating scenarios:

Operating Scenario	***Maximum Hourly Emission Limit***	***Operational Limit***
Cold Start	175.0	NO_x emissions shall not exceed 211.24 lbs per cold start-up.
Warm Start	21.32	NO_x emissions shall not exceed 21.32 lbs per warm start-up.
Shutdown	12.85	NO_x emissions shall not exceed 12.85 lbs per shutdown.

The interim reporting period shall not exceed 12 months from the initial startup date. Written records of commissioning, start-ups and shutdowns shall be kept and made available to SCAQMD and submitted to the CPM for approval.

The project owner/operator shall complete construction and the project shall be fully operational within three years of the issuance of the permit to construct from the SCAQMD.

Verification: The project owner shall provide the SCAQMD and the CPM with the written notification of the initial start-up date no later than 60 days prior to the startup date. The project owner shall submit, commencing one month from the time of gas turbine first fire, a monthly commissioning status report throughout the duration of the commissioning phase that demonstrates compliance with this condition and the emission limits of Condition **AQ-13**. The monthly commissioning status report shall include criteria pollutant emission estimates for each commissioning activity and total commissioning emission estimates. The monthly commissioning status report shall be submitted to the CPM until the report includes the completion of the initial commissioning activities. The project owner shall provide start-up and shutdown occurrence and duration data as part as part of the Quarterly Operation Report (**AQ-SC8**) including records of all aborted turbine startups. The project owner shall make the site available for inspection of the commissioning and startup/shutdown records by representatives of the District, CARB and the Commission.

AQ-4 The new combustion turbine~~Each combustion turbine~~ stack shall have the following emission limitations.

- 2.0 PPM NOx emission averaged over 60 minutes at 15% oxygen, dry basis.
- 2.0 ppm CO emission averaged over ~~60~~180 minutes at 15% oxygen, dry basis.
- 3.0 ppm CO emission averaged over 60 minutes at 15% oxygen, dry basis.
- 2.0 ppm VOC emission averaged over 60 minutes at 15% oxygen, dry basis.
- 5.0 ppm NH_3 emission averaged over 60 minutes at 15% oxygen, dry basis [Refer to Comment 4.1.11].

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-SC8**.

AQ-5 The project owner may ~~at no time purposefully~~ exceed either the mass or concentration emission limits, but not both limits at the same time, as set forth in Conditions of Certification **AQ-1, -2, -3** or **-4** [Refer to Comment 4.1.12].

Verification: The project owner shall submit to the CPM for approval all emissions and emission calculations on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-SC8**.

AQ-6 The operator shall not use refinery gas containing the following specified compounds:

Compound	ppm by volume
Total Reduced Sulfur (calculated as H2S) greater than	40
Total Reduced Sulfur (calculated as H2S) greater than	30

The 40 ppm limit shall be based on a rolling 3-hour averaging period. The 30 ppm limit shall be based on a rolling 24-hour averaging period.

Refinery gas is defined as a mixture of refinery fuel gas, produced within the refinery that may be mixed with~~, and~~ natural gas obtained from a utility regulated by the Public Utilities Commission (PUC) in order to balance heat content of the fuel gas mixture~~, for which the natural gas component of the mixture shall not exceed 50% of the total, by Higher Heating Value (HHV) content~~ [Refer to Comment 4.1.13].

The operator shall not use fuel gas containing the following specified compounds:

Compound	ppm by volume
H2S greater than	162
H2S greater than	60

The 162 ppm limit shall be based on a rolling 3-hour averaging period. The 60 ppm limit shall be based on a rolling 365 successive day average.

The operator shall limit the CTG firing rate to no more than 1069.9 MM Btu per hour. The operator shall limit the HRSG duct burner firing rate to no more than 510 MM Btu per hour [Refer to Comment 4.1.13].

For the purpose of this condition, firing rate shall be defined as energy or heat input of natural gas and refinery gas to the equipment combustion chamber based on the higher heating value (HHV) of the natural gas and refinery gas used.

The refinery gas input to the turbine in any hour shall not exceed 35% of the total volume of gas combusted. Refinery gas shall be as defined in condition B61.X1 (Condition **AQ-6**).

The operator shall install and maintain a(n) continuous monitoring system to accurately indicate the energy being supplied to the~~input at the~~ gas turbine by measurement of Higher Heating Value (HHV) of refinery fuel gas [Refer to Comment 4.1.13].

The operator shall also install and maintain a device to continuously record the parameter being measured. For the purpose of this condition, continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour. The purpose of this condition is to demonstrate compliance with the limitation of refinery fuel gas, as having natural gas accounting for no more than 50% of the Higher Heating Value (HHV) of the mixture.

The operator shall maintain records in a manner approved by the District to demonstrate compliance with this condition. The operator shall install and maintain a fuel flow meter and recorder to accurately indicate and record the fuel usage being supplied to the turbine.

Verification: The project owner shall submit to the CPM for approval all fuel usage records on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-SC8**.

AQ-7 The project owner shall conduct an initial source test for NOx, CO, SOx, VOC, NH_3 and PM10 and periodic source test every three years thereafter for NOx, CO, SOx, VOC and PM10 of the ~~each gas~~ new turbine exhaust stack in accordance with the following requirements [Refer to Comment 4.1.14]:

- The project owner shall submit a source test protocol to the SCAQMD and the CPM 45 days prior to the proposed source test date for approval. The protocol shall include the proposed operating conditions of the gas turbine, the identity of the testing lab, a statement from the lab certifying that it meets the criteria of SCAQMD Rule 304, and a description of all sampling and analytical procedures.
- The initial source test shall be conducted no later than 180 days following the date of first fire.
- The SCAQMD and CPM shall be notified at least 10 days prior to the date and time of the source test.
- The source test shall be conducted with the gas turbine operating under maximum, average and minimum loads.
- The source test shall be conducted to determine the oxygen levels in the exhaust.
- The source test shall measure the fuel flow rate, the flue gas flow rate and the turbine generating output in MW.
- The source test shall be conducted for the pollutants listed using the methods, averaging times, and test locations indicated and as approved by the CPM as follows:

Source Test Requirements

Pollutant	**Method**	**Averaging Time**	**Test Location**
NOx	SCAQMD Method 100.1	1 hour	Outlet of SCR
CO	SCAQMD Method 100.1	1 hour	Outlet of SCR
SOx	District Method	N/A	Fuel Sample

Source Test Requirements

Pollutant	**Method**	**Averaging Time**	**Test Location**
	307.91		
VOC	District Method 25.3 or TO-12 [Refer to Comment 4.1.14]	1 hour	Outlet of SCR
PM10	District Method 5	4 hours	Outlet of SCR
Ammonia	SCAQMD Methods 5.3 and 207.1 or U.S. EPA Method 17.	1 hour	Outlet of SCR

- The source test results shall be submitted to the SCAQMD and the CPM no later than 60 days after the source test was conducted.
- All emission data is to be expressed in the following units:
  1. ppmv corrected to 15% oxygen dry basis,
  2. pounds per hour,
  3. pounds per million cubic feet of fuel burned and
  4. additionally, for PM10 only, grains per dry standard cubic feet of fuel burned.
- Exhaust flow rate shall be expressed in terms of dry standard cubic feet per minute and ~~dry~~ actual cubic feet per minute [Refer to Comment 4.1.14].
- All moisture concentrations shall be expressed in terms of percent corrected to 15% oxygen.
- For the purpose of this condition, alternative test methods may be allowed for each of the above pollutants upon concurrence of the AQMD, CARB, EPA and the Energy Commission.

Verification: The project owner shall submit the proposed protocol for the initial source tests 45 days prior to the proposed source test date to both the SCAQMD and CPM for approval. The project owner shall submit source test results no later than 60 days following the source test date to both the SCAQMD and CPM. The project owner shall notify the SCAQMD and CPM no later than 10 days prior to the proposed initial source test date and time.

AQ-8 The project owner shall conduct source testing of the ~~each gas~~ turbine exhaust stack in accordance with the following requirements [Refer to

Comment 4.1.15]:

- The project owner shall submit a source test protocol to the SCAQMD and the CPM for approval no later than 45 days prior to the proposed source test date. The protocol shall include the proposed operating conditions of the gas turbine, the identity of the testing lab, a statement from the lab certifying that it meets the criteria of SCAQMD Rule 304, and a description of all sampling and analytical procedures.
- Source testing for ammonia slip only shall be conducted quarterly for the first 12 months of operation and annually thereafter.
- NOx concentrations as determined by CEMS shall be simultaneously recorded during the ammonia test. If the NOx CEMS is inoperable, a test shall be conducted to determine the NOx emission by using SCAQMD Method 100.1 measured over a 60 minute time period.
- Source testing shall be conducted to determine the ammonia emissions from the ~~each gas~~ new turbine exhaust stack using SCAQMD Method 5.3 and 207.1 or U.S. EPA Method 17 measured over a 1 hour averaging period at the outlet of the SCR [Refer to Comment 4.1.15].
- The SCAQMD and CPM shall be notified of the date and time of the source testing at least 7 days prior to the test.
- The source test shall be conducted and the results submitted to the SCAQMD and CPM within 45 days after the test date.
- Source testing shall measure the fuel flow rate, the flue gas flow rate and the gas turbine generating output.
- The test shall be conducted when the equipment is operating at 80% load or greater.
- If the turbine is not in operation during one quarter, then no testing is required during that quarter.
- All emission data is to be expressed in the following units:
  1. ppmv corrected to 15% oxygen,
  2. pounds per hour,
  3. pounds per million cubic feet of fuel burned.

Verification: The project owner shall submit the proposed protocol for the source tests 45 days prior to the proposed source test date to both the SCAQMD and CPM for approval. The project owner shall notify the SCAQMD and CPM no later than 7 days prior to the proposed source test date and time. The project owner shall submit source test results no later than 45 days following the source test date to both the SCAQMD and CPM.

AQ-9 The project owner shall install and maintain a CEMS in the ~~in each~~ exhaust stack of the combustion turbine train~~s~~ to measure the following parameters

[Refer to Comment 4.1.16]:

- NOx concentration in ppmv and CO concentration in ppmv.
- Concentrations shall be corrected to 15% oxygen on a dry basis.
- The CEMS will convert the actual CO concentrations to mass emission rates (lb/hr) and record the hourly emission rates on a continuous basis.
- The CEMS shall be installed and operated to measure CO concentration over a ~~15 minute~~one and three hour averaging time period [Refer to Comment 4.1.16].
- The CEMS shall be installed and operated in accordance with an approved SCAQMD Rule 218 CEMS plan application and the requirements of Rule 2012.
- The CO CEMS shall be installed and operating no later than 90 days after initial start-up of the turbine.
- The NOx CEMS shall be installed and operating no later than ~~12~~90 days ~~months~~ after initial start-up of the turbine [Refer to Comment 4.1.16].

During the interim period between the initial start-up and the provisional certification date of the CEMS, the project owner shall comply with the monitoring requirements of Rule 2012 (h)(2) and Rule 2012 (h)(3). Within two weeks of the turbine start-up date, the project owner shall provide written notification to the SCAQMD of the exact date of start-up.

Verification: Within 30 days of certification, the project owner shall notify the CPM of the completion of the certification process for the CEMS.

AQ-10 The project owner shall keep records in a manner approved by the SCAQMD for the following items:

- Commissioning hours, type of control, and fuel use
- Date and time of each start-up and shutdown
- In addition to the requirements of a certified CEMS, fuel use records shall be kept during and after the commissioning period and prior to CEMS certification
- Minute by minute data (NOX and O2 concentration and fuel flow at a minimum) for each turbine start-up.

Verification: The project owner shall submit to the CPM for approval all fuel usage records on a quarterly basis as part of the quarterly emissions report of Condition of Certification **AQ-SC8**.

AQ-11 The owner/operator shall determine the hourly ammonia slip emissions from the~~each~~ exhaust stack ~~for each gas turbine individually~~ via both the following formula [Refer to Comment 4.1.17]:

SCAQMD Requirement

NH3 (ppmv) = [a-b*(c*1.2)/1E6]*1E6/b

Where:

a = NH3 injection rate (lb/hr) / 17(lb/lbmol),

b = dry exhaust flow rate (scf/hr) / 385.5 (scf/lbmol),

c = change in measured NOx across the SCR (ppmvd at 15% O2)

The above described ammonia slip calculation procedure shall not be used for compliance determination or emission information determination without corroborative data using an approved reference method for the determination of ammonia for the District.

Energy Commission Requirement:

NH3 (ppmv @ 15% O2) = ((a-b*(c/1E6))*1E6/b)*d, where:

a = NH3 injection rate (lb/hr)/17(lb/lbmol),

b = dry exhaust gas flow rate (lb/hr)/ (29(lb/lbmol), or

b = dry exhaust flow rate (scf/hr) / 385.5 (scf/lbmol),

c = change in measured NOx concentration ppmv corrected to 15% O2 across catalyst, and

d = correction factor.

The correction factor shall be derived through compliance testing by comparing the measured and calculated ammonia slip. The correction factor shall be reviewed and approved by the CPM on at least an annual basis. The correction factor may rely on previous compliance source test results or other comparable analysis as the CPM finds the situation warrants. The above described ammonia slip calculation procedure shall be used for Energy Commission compliance determination for the ammonia slip limit as prescribed in Condition of Certification **AQ-4** and reported to the CPM on a quarterly basis as prescribed in Condition of Certification **AQ-SC8**.

The 5 ppm NH3 limit(s) shall not apply during commissioning, start-up, and shutdown periods. The commissioning period shall not exceed 550 hours. The time for cold startup shall not exceed three hours for each startup. The time for warm startup shall not exceed one hour. The time for shutdown shall not exceed one hour. The turbine shall be limited to four cold startups per year, 12 warm startups per year, and 16 shutdowns per year.

An exceedance of the ammonia slip limit as demonstrated by the above Energy Commission formula shall not in and of itself constitute a violation of the limit. An exceedance of the ammonia slip limit shall not exceed 6 hours in duration. In the event of an exceedance of the ammonia slip limit exceeding 6 hours duration, the project owner shall notify the CPM within 72 hours of the occurrence. This notification must include, but is not limited to: the date and time of the exceedance, duration of the exceedance, estimated emissions as a result of the exceedance, the suspected cause of the exceedance and the corrective action taken or planned. Exceedances of the ammonia limit that are less than or equal to 6 hours in duration shall be noted in a specific section within the Quarterly Report (**AQ-SC8**). This section shall include, but is not limited to: the date and time of the exceedance, duration of the exceedance, and the estimated emissions as a result of the exceedance. Exceedances shall be deemed chronic if they total more than 10% of the operation ~~for any single exhaust stack~~ [Refer to Comment 4.1.17]. Chronic exceedances must be investigated and redressed in a timely manner and in conjunction with the CPM through the cooperative development of a compliance plan. The compliance plan shall be developed to bring the project back into compliance first and foremost and shall secondly endeavor to do so in a feasible and timely manner, but shall not be limited in scope.

The owner/operator shall maintain compliance with the ammonia slip limit, redress exceedances of the ammonia slip limit in a timely manner, and avoid chronic exceedances of the ammonia slip limit. Exceedances shall be deemed a violation of the ammonia slip limit if they are not properly redressed as prescribed herein.

The owner/operator shall install a NOx analyzer to measure the SCR inlet NOx ppm accurate to within +/- 5% calibrated at least once every 12 months.

Verification: The project owner shall include ammonia slip concentrations averaged on an hourly basis calculated via both protocols provided as part of the Quarterly Operational Report required in Condition of Certification **AQ-SC8**. The project owner shall submit all calibration results performed to the CPM within 60 days of the calibration date. The project owner shall submit to the CPM for approval a proposed correction factor to be used in the Energy Commission formula at least once a year but not to exceed 180 days following the completion of the annual ammonia compliance source test. Exceedances of the ammonia limit shall be reported as prescribed herein. Chronic exceedances of the ammonia slip limit shall be identified by the project owner and confirmed by the CPM within 60 days of the fourth quarter Quarterly Operational Report (**AQ-SC8**) being submitted to the CPM. If a chronic exceedance is identified and confirmed, the project owner shall work in conjunction with the CPM to develop a reasonable compliance plan to investigate and redress the chronic exceedance of the ammonia slip limit within 60 days of the above confirmation.

AQ-12 The operator shall install and maintain an ammonia injection flow meter and recorder to accurately indicate and record the ammonia injection flow rate being supplied the turbine. The device or gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months ~~The ammonia injection system shall be placed in full operation as soon as the minimum temperature is reached. The minimum temperature is listed as 540~~

~~degrees F at the inlet to the SCR reactor~~ [Refer to Comment 4.1.18].

Continuously recording is defined for this condition as at least once every hour and is based on the average of the continuous monitoring for that hour.

Verification: The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate device has been installed and is functioning properly. The project owner shall submit annual calibration results within 30 days of their successful completion.

AQ-13 The operator shall install and maintain a temperature gauge and recorder to accurately indicate and record the temperature in the exhaust at the inlet of the SCR reactor. The gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months~~The catalyst temperature range shall remain between 740 degree F and 840 degree F. The catalyst temperature shall not exceed 840 degrees F. The temperature range requirement of this condition does not apply during startup operations of the turbine.~~ [Refer to Comment 4.1.19].

Continuously recording is defined for this condition as at least once every hour and is based on the average of the continuous monitoring for that hour.

Verification: The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate device has been installed and is functioning properly. The project owner shall submit annual calibration results within 30 days of their successful completion.

AQ-14 The operator shall install and maintain a pressure gauge and recorder to accurately indicate and record the pressure differential across the SCR catalyst bed in inches of water column. The gauge shall be accurate to within plus or minus 5% and shall be calibrated once every twelve months~~The pressure drop across the catalyst shall not exceed 12 inches of water column during the start-up period.~~ [Refer to Comment 4.1.20]. The operator shall install and maintain a(n) pressure gauge to accurately indicate the differential pressure across the CO catalyst reactor in inches water column.

Continuously recording is defined for this condition as at least once every month and is based on the average of the continuous monitoring for that month.

Verification: The project owner shall submit to the CPM no less than 30 days after installation, a written statement by a California registered Professional Engineer stating that said engineer has reviewed the as-built-designs or inspected the identified equipment and certifies that the appropriate device has been installed and is functioning properly. The project owner shall submit annual calibration results within 30 days of their successful completion.

AQ-15 The project equipment shall not be operated unless the project owner demonstrates to the SCAQMD Executive Officer that the facility holds sufficient Reclaim Trading Credits (RTCs) to offset the prorated annual emissions increase for the first compliance year of operation. In addition, this equipment shall not be operated unless the project owner demonstrates to the Executive Officer that, at the commencement of each compliance year after the first compliance year of operation, the facility holds sufficient RTCs in an amount equal to the annual emission increase. The project owner shall submit all such information to the CPM for approval.

To comply with this condition, the operator shall, prior to the 1st compliance year hold a minimum NOx RTCs of 99,850 lbs/yr and a minimum SOx RTCs of 31,050 lbs/yr. This condition shall apply during the 1st 12 months of operation, commencing with the initial operation of the gas turbine/heat recovery steam generator.

ACRONYMS

AQCMM	Air Quality Construction Mitigation Manager
AQCMP	Air Quality Construction Mitigation Plan
CARB	California Air Resources Board
BACT	Best Available Control Technology
bhp	brake horse power
CEC	California Energy Commission (or Energy Commission)
CEQA	California Environmental Quality Act
CO	Carbon Monoxide
CPM	(CEC) Compliance Project Manager
ERC	Emission Reduction Credit
FDOC	Final Determination Of Compliance
gr	Grains (1 gr $\cong$ 0.0648 grams)
HRSG	Heat Recovery Steam Generator
ISCST3	Industrial Source Complex Short Term, version 3
MMBtu	Million British thermal units
MW	Megawatts (1,000,000 Watts)
NH_3	Ammonia
NO_2	Nitrogen Dioxide
NOx	Oxides of Nitrogen *or* Nitrogen Oxides
NSR	New Source Review
PDOC	Preliminary Determination Of Compliance
PM10	Particulate Matter less than 10 microns in diameter
PM2.5	Particulate Matter less than 2.5 microns in diameter
ppm	Parts Per Million
ppmv	Parts Per Million by Volume
ppmvd	Parts Per Million by Volume, Dry
PRC	Priority Reserve Credit
PSA	Preliminary Staff Assessment (this document)
PSD	Prevention of Significant Deterioration
RECLAIM	Regional Clean Air Incentives Market
ROG	Reactive Organic Gases
RTC	RECLAIM Trading Credit
SCAQMD	South Coast Air Quality Management SCAQMD (also: District)
scf	Standard Cubic Feet
SCR	Selective Catalytic Reduction
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_3	Sulfate
SOx	Oxides of Sulfur
SoCAB	South Coast Air Basin
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile Organic Compounds

REFERENCES

CARB 2001. Ozone Transport: 2001 Review, April 2001.

CARB 2006c - California Air Resources Board. Almanac Emission Projection Data (published in 2006). http://www.arb.ca.gov/ei/emsmain/emsmain.htm

CARB 2010a - California Air Resources Board. Ambient Air Quality Standards. September 8, 2010. http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

CARB 2010b - California Air Resources Board. California Ambient Air Quality Data, http://www.arb.ca.gov/adam/.

SCAQMD 2003 - Final 2003 Air Quality Management Plan (adopted 12/10/1999). Link: http://www.aqmd.gov/aqmp/AQMD03AQMP.htm

SCAQMD 2006 - South Coast Air Quality Management District. Air Quality Standards Compliance Report. September 2003.

SCAQMD 2007a - Final 2007 Air Quality Management Plan (adopted 6/1/2007). Link: http://www.aqmd.gov/aqmp/07aqmp/index.html

SCAQMD 2007b - Final Socioeconomic Report for the Final 2007 AQMP (adopted 6/1/2007). Link: http://www.aqmd.gov/aqmp/07aqmp/07AQMP_socio.html

SCAQMD 2010 – South Coast Air Quality Management District / M. Nazemi (tn: 58800). SCAQMD's Preliminary Determination of Compliance. Dated 10/12/2010. Submitted to CEC/Docket Unit on 12/19/2010.

US EPA 2010 - AirData: Access to Air Pollution Data. http://www.epa.gov/air/data/index.html.

Watson Cogeneration Company (BP Watson) 2009 – Application for Certification, Watson Cogeneration Steam and Electric Reliability Project.

WRCC 2009. Western Regional Climate Center. http://www.wrcc.dri.edu/.

AIR QUALITY APPENDIX AIR-1

Greenhouse Gas Emissions

Testimony of Steve Radis

SUMMARY OF CONCLUSIONS

The Watson Cogeneration Steam and Electric Reliability Project (BP Watson) is a proposed addition to the state's electricity system that would produce greenhouse gas (GHG) emissions while generating electricity for California consumers. The proposed BP Watson project will add a nominal 85 megawatt (MW) combustion turbine generator (CTG) with a single-pressure heat recovery steam generator (HRSG) to provide additional process steam to the BP Carson refinery. The original plant design allocated plot space and included provisions to accommodate a new unit at a later date. The additional unit is sized and designed to provide reliable base load operations with supplemental duct firing in the HRSG. The Project includes one General Electric (GE) 7EA CTG, with an inlet fogging system, one duct fired HRSG, two redundant natural gas compressors, one boiler feedwater (BFW) pump, one circulating water pump, two new cells added to an existing cooling tower, electrical distribution system, instrumentation and controls, and all necessary auxiliary equipment as described herein. The Project's primary objective is to provide additional process steam in response to the refinery's process steam demand.

Its addition to the system would displace other less efficient, higher GHG-emitting generation. Because the project's GHG emissions per megawatt-hour (MWh) would be lower than those of other power plants that the project would displace, the addition of the BP Watson project would contribute to a reduction of the California and overall Western Electricity Coordinating Council system GHG[1] emissions and GHG emission rate average.

While the BP Watson project would emit GHG emissions, the relative efficiency of the BP Watson project and the system build-out of renewable resources in California would result in a net cumulative reduction of GHG emissions from new and existing fossil resources. Electricity is produced by operation of inter-connected system of generation resources. Operation of one power plant, like the BP Watson project, affects all other power plants in the interconnected system. The operation of the BP Watson project would affect the overall electricity system operation and GHG emissions in several ways:

- The BP Watson project would facilitate to some degree the replacement of high GHG emitting (e.g., out-of-state coal) electricity generation that must be phased out to meet the State's new Emissions Performance Standard implemented as required by SB 1368.
- The BP Watson project could facilitate to some extent the replacement of generation provided by aging and once-through cooling power plants.

[1] Fuel-use closely correlates to the efficiency of and carbon dioxide (CO_2) emissions from natural gas-fired power plants. And since the terms CO_2 emissions from the fuel combustion dominate greenhouse gas (GHG) emissions from power plants, the terms CO_2 and GHG are used interchangeably in this section.

- The BP Watson project would help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

- The BP Watson project would contribute to the Air Resources Board's goal of adding 4,000 megawatts of new combined heat and power (cogeneration) by 2020 as part of their strategy to meet greenhouse gas emissions reduction goals of AB 32.

The BP Watson project would not provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation. It would be used in a base load mode of operation to provide for onsite process steam needs. Because the facility is not dispatchable, it would also not provide for peaking capacity needs identified by Southern California Edison (SCE), the Energy Commission, the California Public Utilities Commission (CPUC), and the California ISO for the Los Angeles Basin Local Capacity Requirements Area. Also, the BP Watson project would utilize the General Electric Power Systems (GE) 7EA CTG that does not allow for fast startup and ramping capability. However, the high reliability of the BP Watson facility would significantly reduce the possibility of refinery upsets due to loss of steam or power.

Despite the lack of dispatchability, as a new increment of power production the project will provide competitively priced electricity in the form of baseload energy, and ancillary services for sale to electric service providers to help meet expected electrical demand growth in Southern California.

Staff concludes that the short-term minor emission of greenhouse gases during construction that are necessary to create this new low GHG-emitting peaking resource would be sufficiently reduced by "best practices" and would, therefore, not be significant.

The project would meet the Greenhouse Gases Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.) that applies to utility purchases of base load power from power plants, should operating conditions at the BP Watson project change in the future to a base load facility. Any utility that enters into a contract with the BP Watson project would need to seek a finding that the project meets the EPS based on the operation of the project at that time, under a proposed PPA, and any other conditions that dictate the operation of the BP Watson project. The BP Watson facility as proposed meets the EPS of 0.500 metric tonnes CO_2 per megawatt-hour, with a rating of 0.436 metric tonnes CO_2 per megawatt-hour.

Staff notes that mandatory reporting of the GHG emissions provides the necessary information for the California Air Resources Board to develop greenhouse gas regulations and/or trading markets required by the California Global Warming Solutions Act of 2006 (AB 32 Núñez, Statutes of 2006, Chapter 488, Health and Safety Code sections 38500 et seq.). The project may be subject to additional reporting requirements and GHG reductions or trading requirements as these regulations are more fully developed and implemented. On a federal level 40 CFR 98 requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year.

INTRODUCTION

GHG emissions are not criteria pollutants, but are discussed in the context of cumulative impacts. In December 2009, the U.S. Environmental Protection Agency (EPA) declared that greenhouse gases (GHGs) threaten the public health and welfare of the American people (the so-called "endangerment finding"), and this became effective on January 14, 2010. Regulating GHGs at the federal level will be required by the Prevention of Significant Deterioration Program (PSD) requirements beginning January 2, 2011 for sources otherwise subject to PSD requirements for previously included pollutants and July 1, 2011 for additional facilities that would exceed an annual emissions rate of 75,000 tons per year of carbon dioxide-equivalent emissions, including the BP Watson project, which is estimated to emit over 309,000 metric tonnes per year.

Federal rules that became effective December 29, 2009 (40 CFR 98) already require federal reporting of GHGs. As federal rulemaking evolves, staff at this time focuses on analyzing the ability of the project to comply with existing federal- and state-level policies and programs for GHGs. The State has demonstrated a clear willingness to address global climate change though research, adaptation[2], and GHG inventory reductions. In that context, staff evaluates the GHG emissions from the proposed project, presents information on GHG emissions related to electricity generation, and describes the applicable GHG standards and requirements.

Generation of electricity using any fossil fuel, including natural gas, can produce greenhouse gases with the criteria air pollutants that have been traditionally regulated under the federal and state Clean Air Acts. For fossil fuel-fired power plants, the GHG emissions include primarily carbon dioxide, with much smaller amounts of nitrous oxide (N_2O, not NO or NO_2, which are commonly known as NOx or oxides of nitrogen), and methane (CH_4 – often from unburned natural gas). Also included are sulfur hexafluoride (SF_6) from high voltage equipment and hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) from refrigeration/chiller equipment. GHG emissions from the electricity sector are dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG emissions are small and also are more likely to be easily controlled or reused or recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials.

Global warming potential is a relative measure, compared to carbon dioxide, of a compound's residence time in the atmosphere and ability to warm the planet. Mass emissions of GHGs are converted into carbon dioxide equivalent (CO2E) metric tonnes (MT) for ease of comparison.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local laws and policies in **Greenhouse Gas Table 1** pertain to the control and mitigation of greenhouse gas emissions. Staff's analysis examines the project's compliance with these requirements.

[2] While working to understand and reverse global climate change, it is prudent to also adapt to potential changes in the state's climate (for example, changing rainfall patterns).

Greenhouse Gas Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
40 Code of Federal Regulations (CFR) Parts 51, 52, 70 and 71	This rule "tailors" GHG emissions to PSD and Title V permitting applicability criteria.
40 Code of Federal Regulations (CFR) Part 98	This rule requires mandatory reporting of GHG emissions for facilities that emit more than 25,000 metric tons of CO_2 equivalent emissions per year.
State	
California Global Warming Solutions Act of 2006, AB 32 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)	This act requires the California Air Resource Board (ARB) to enact standards that will reduce GHG emission to 1990 levels by 2020. Electricity production facilities will be regulated by the ARB.
California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.	These ARB regulations implement mandatory GHG emissions reporting as part of the California Global Warming Solutions Act of 2006 (Stats. 2006; Chapter 488; Health and Safety Code sections 38500 et seq.)
Title 20, California Code of Regulations, section 2900 et seq.; CPUC Decision D0701039 in proceeding R0604009	The regulations prohibit utilities from entering into long-term contracts with any base load facility that does not meet a greenhouse gas emission standard of 0.5 metric tonnes carbon dioxide per megawatt-hour (0.5 $MTCO_2$/MWh) or 1,100 pounds carbon dioxide per megawatt-hour (1,100 lbs CO_2/MWh)

GLOBAL CLIMATE CHANGE AND ELECTRICITY PRODUCTION

There is general scientific consensus that climate change is occurring and that human activity contributes in some measure (perhaps significantly) to that change. Man-made emissions of greenhouse gases, if not sufficiently curtailed, are likely to contribute further to continued increases in global temperatures. Indeed, the California Legislature finds that "[g]lobal warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California" (Cal. Health & Safety Code, sec. 38500, division 25.5, part 1).

In 1998, the Energy Commission identified a range of strategies to prepare for an uncertain climate future, including a need to account for the environmental impacts associated with energy production, planning, and procurement (CEC 1998, p.5). In 2003, the Energy Commission recommended that the state require reporting of greenhouse gases or global climate change[3] emissions as a condition of state licensing of new electric generating facilities (CEC 2003, IEPR p. 42). In 2006, California enacted the California Global Warming Solutions Act of 2006 (AB 32). It requires the California Air Resources Board (ARB) to adopt standards that will reduce statewide GHG emissions to statewide GHG emissions levels in 1990, with such reductions to be

[3] Global climate change is the result of greenhouse gases, or air emissions with global warming potentials, affecting the global energy balance, and thereby, climate of the planet. The terms greenhouse gases (GHG) and global climate change (GCC) gases are used interchangeably.

achieved by 2020.[4] To achieve this, ARB has a mandate to define the 1990 emissions level and achieve the maximum technologically feasible and cost-effective GHG emission reductions.

The ARB adopted early action GHG reduction measures in October 2007, adopted mandatory reporting requirements and the 2020 statewide target in December 2007, and adopted a statewide scoping plan in December 2008 to identify how emission reductions will be achieved from significant sources of GHG via regulations, market mechanisms, and other actions. ARB staff is developing regulatory language to implement its plan and holds ongoing public workshops on key elements of the recommended GHG reduction measures, including market mechanisms (ARB 2006). The regulations must be effective by January 1, 2011 and mandatory compliance commences on January 1, 2012. The mandatory reporting requirements are effective for electric generating facilities over 1 megawatt (MW) capacity, and the due date for initial reports by existing facilities was June 1, 2009.

Examples of strategies that the state might pursue for managing GHG emissions in California, in addition to those recommended by the Energy Commission and the Public Utilities Commission, were identified in the California Climate Action Team's Report to the Governor (CalEPA 2006). The scoping plan approved by ARB in December 2008 builds upon the overall climate policies of the Climate Action Team report and shows the recommended strategies to achieve the goals for 2020 and beyond. Some strategies focus on reducing consumption of petroleum across all areas of the California economy. Improvements in transportation energy efficiency (fuel economy) and land use planning and alternatives to petroleum-based fuels are slated to provide substantial reductions by 2020 (CalEPA 2006). The scoping plan includes a 33% Renewables Portfolio Standard (RPS), aggressive energy efficiency targets, and a cap-and-trade system that includes the electricity sector (ARB 2008). The scoping plan also includes a strategy to greatly expand use of combined heat and power (cogeneration) facilities by adding 4,000 megawatts of new capacity by 2020.

It is possible that GHG reductions mandated by ARB will be non-uniform or disproportional across emitting sectors, in that most reductions will be based on cost-effectiveness (i.e., the greatest effect for the least cost). For example, the ARB proposes a 40% reduction in GHG from the electricity sector, even though that sector currently only produces about 25% of the state's GHG emissions. In response, in September 2008 the Energy Commission and the Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified regulation points should ARB decide that a multi-sector cap and trade system is warranted.

The Energy Commission's *2007 Integrated Energy Policy Report* (IEPR) also addressed climate change within the electricity, natural gas, and transportation sectors (CEC 2007). For the electricity sector, it recommends such approaches as pursuing all cost-effective energy efficiency measures and meeting the Governor's stated goal of a 33% renewable portfolio standard. The Energy Commission's *2009 Integrated Energy Policy*

[4] Governor Schwarzenegger has also issued Executive Order S-3-05 establishing a goal of 80% below 1990 levels by 2050. This goal is also contained in ARB's "Scoping Plan" being developed to meet AB 32 requirements.

Report continues to emphasize the importance of meeting greenhouse gas emissions reduction goals along with other important statewide issues such as backing out use of once-through cooling in coastal California power plants (CEC 2009c).

SB 1368,[5] enacted in 2006, and regulations adopted by the Energy Commission and the Public Utilities Commission pursuant to the bill, prohibits California utilities from entering into long-term commitments with any base load facilities that exceed the Emission Performance Standard (EPS) of 0.500 metric tonnes CO_2 per megawatt-hour[6] (1,100 pounds CO_2/MWh). Specifically, the SB 1368 Emission Performance Standard (EPS) applies to base load power from new power plants, new investments in existing power plants, and new or renewed contracts with terms of five years or more, including contracts with power plants located outside of California.[7] If a project, instate or out of state, plans to sell base load electricity to California utilities, that utility will have to demonstrate that the project meets the EPS. *Base load* units are defined as units that operate at a capacity factor higher than 60%. As a project applying for the flexibility to operate as a base load facility, BP Watson would have to meet the SB 1368 EPS. As shown in **Greenhouse Gas Table 3**, GHG emissions from the BP Watson project are below the limit of SB 1368 requirements.

In addition to these programs, California is involved in the Western Climate Initiative, a multi-state and international effort to establish a cap and trade market to reduce greenhouse gas emissions in the Western United States and the Western Electricity Coordinating Council (WECC). The timelines for the implementation of this program are similar to those of AB 32, with full roll-out beginning in 2012. And as with AB 32, the electricity sector has been a major focus of attention.

ELECTRICITY PROJECT GREENHOUSE GAS EMISSIONS

Electricity use can be as simple as turning on a switch to operate a light or fan. The system to deliver adequate and reliable electricity supply is complex and variable. But it operates as an integrated whole to meet demand, such that the dispatch of a new source of generation generally curtails or displaces one or more less efficient or less competitive existing sources. Within the system, generation resources provide electricity, or energy, generating capacity, and ancillary services to stabilize the system and facilitate electricity delivery, or movement, over the grid. *Capacity* is the instantaneous output of a resource, in megawatts. *Energy* is the capacity output over a unit of time, for example an hour or year, generally reported as megawatt-hours or gigawatt-hours (GWh). Ancillary services[8] include regulation, spinning reserve, non-spinning reserve, voltage support, and black start capability. Individual generation resources can be built and operated to provide only one specific service. Alternatively, a resource may be able to provide one or all of these services, depending on its design and constantly changing system needs and operations.

[5] Public Utilities Code § 8340 et seq.
[6] The Emission Performance Standard only applies to carbon dioxide and does not include emissions of other greenhouse gases converted to carbon dioxide equivalent.
[7] See Rule at http://www.cpuc.ca.gov/PUBLISHED/FINAL_DECISION/64072.htm
[8] See page CEC 2009b, page 95.

California is actively pursuing policies to reduce GHG emissions that include adding non-GHG emitting renewable generation resources to the system mix. In this context, and because fossil-fueled resources produce GHG emissions, it is important to consider the role and necessity of also adding fossil-fuel resources such as the BP Watson project. On October 8, 2008, the Energy Commission adopted an order initiating an informational (OII) proceeding (08-GHG OII-1) to solicit comments on how to assess the greenhouse gas impacts of proposed new power plants in accordance with the California Environmental Quality Act (CEQA). A report prepared as a response to the GHG OII (CEC 2009a) defines five roles that gas-fired power plants are likely to fulfill in a high-renewables, low-GHG system (CEC 2009b, pp 93 and 94):

1. Intermittent generation support
2. Local capacity requirements
3. Grid operations support
4. Extreme load and system emergency
5. General energy support.

The Energy Commission staff-sponsored report reasonably assumes that non-renewable power plants added to the system would almost exclusively be natural gas-fueled. Nuclear, geothermal, and biomass plants are generally base load and not dispatchable. Solid fueled projects are also generally base load, not dispatchable, and carbon sequestration technologies needed to reduce the GHG emission rates to meet the EPS are not yet developed (CEC 2009b, p. 92). Further, California has almost no sites available to add highly dispatchable hydroelectric generation.

This analysis provides the staff's conclusions concerning greenhouse gas emissions for this siting case. Future power plant siting and amendment cases are likely to be reviewed with the benefit of new information and policy direction from the Energy Commission. This analysis recognizes that the "prudent use" of natural gas for electricity generation will serve to optimize the system (for integrating intermittent renewable generation and providing reliability), but, without further analysis and policy direction by the Commission to refine this general understanding, this analysis leaves the implications for optimizing the system to future cases (CEC 2009a).

The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project. This precedent decision requires all new natural gas fired power plants certified by the Energy Commission to: (a) not increase the overall system heat rate for natural gas plants, (b) not interfere with generation from existing renewable facilities nor interfere with the integration of new renewable generation, and (c) take into account these factors to ensure a reduction of systemwide GHG emissions and support the goals and policies of AB 32 (CEC 2009e).

The proposed project, with its low heat rate, would meet conditions (a) and (c). As a base load facility, the BP Watson project would not meet condition (b) by potentially interfering with renewable integration; however, given the project's location in a heavy load pocket, the need to provide the refinery with a reliable steam source, and significantly reducing the possibility of refinery upsets due to loss of steam or power, it is unlikely that the project would result in any measurable interference with renewable generation.

Project Construction

Construction of industrial facilities such as power plants requires coordination of numerous equipment and personnel. The concentrated on-site activities result in short-term, unavoidable increases in vehicle and equipment emissions that include greenhouse gases. Construction of the BP Watson project would involve 18 months of activity. The project owner provided a GHG emission estimate for the entirety of the construction phase. The GHG emissions estimate, presented below in **Greenhouse Gas Table 2**, includes the total emissions for the 20 months of construction activity in terms of CO_2-equivalent.

Construction of the new combustion turbine/HRSG facility and addition of the cooling tower cells is expected to result in the temporary disturbance of approximately 2.5 acres. A 25 acre Construction Laydown and Parking Area would also be used for materials storage and craft labor parking. Construction activity is expected to last for a total of 20 months (not including startup and commissioning).

Project Operations

The project site is a 2.5-acre brown field site located within the boundary of the existing Watson Cogeneration Facility, which is a 21.7-acre area within the 428-acre BP Carson Refinery (BP Refinery).The BP Watson project would operate as a base loaded cogeneration unit and is proposed to be permitted for 8,760 hours of operation per year, with an expected facility capacity factor of greater than 95%. The expansion project would consist of the following:

- Installation of a nominal 85 megawatt (MW) GE 7EA Dry Low NOx (DLN) combustion turbine with inlet fogging.
- Installation of the HRSG producing up to approximately (~) 659 Klbs steam/hr and equipped with a duct burner with up to 447.9 MMBtu/hr (high heating value [HHV]) heat input at 36°F.
- Installation of two additional cells to the existing seven cell wet cooling tower to provide cooling and heat rejection from the new power block process.

Greenhouse Gas Table 2
BP Watson project, Estimated Potential Construction Greenhouse Gas Emissions

Construction Source [a]	Construction-Phase GHG Emissions (over 20 months) (MTCO2E) [b]
Diesel Combustion	3,158
Gasoline Combustion	308
Construction Total	**3,466**

Source: BP Watson 2009.

NOTES:
A. INCLUDES EMISSIONS FROM WORKERS COMMUTING TO WORK SITE.
B. ONE METRIC TONNE (MT) EQUALS 1.1 SHORT TONS OR 2,204.6 POUNDS OR 1,000 KILOGRAMS.

The primary sources of GHG would be the natural gas fired combustion turbines. There will also be a small amount of GHG emissions from the sulfur hexafluoride emissions from electrical component equipment.

Greenhouse Gas Table 3 shows what the proposed project, as permitted, could potentially emit in greenhouse gases on an annual basis. All emissions are converted to CO_2-equivalent and totaled. Electricity generation GHG emissions are generally dominated by CO_2 emissions from the carbon-based fuels; other sources of GHG are typically small and also are more likely to be easily controlled or reused/recycled, but are nevertheless documented here as some of the compounds have very high relative global warming potentials. A small amount of SF_6 containing equipment will be required for this project, and the leakage of SF_6 and its CO_2 equivalent emissions have been estimated.

The proposed project would be permitted, on an annual basis, to emit approximately 309,226 metric tonnes of CO_2-equivalent per year if operated at its maximum permitted level. The new BP Watson facility would be more GHG-efficient than existing power plants in the Los Angeles Basin Local Capacity Requirements Area, which has facilities with GHG performance ranging from 0.452 to 0.900 MTCO2/MWh. The proposed BP Watson project would emit at 0.436 MTCO2/MWh, which would meet the SB 1368 Greenhouse Gas Emission Performance Standard of 0.500 MTCO2/MWh.

Greenhouse Gas Table 3
BP Watson project, Estimated Potential Greenhouse Gas (GHG) Emissions

Emissions Source	Operational GHG Emissions (MTCO2E/yr) [a]
Turbines	309,125
Sulfur Hexafluoride (SF6) Leakage	101
Total Project GHG Emissions (MTCO2E/yr)	**309,226**
Estimated Annual Energy Output (MWh/yr) [b]	708,535
Estimated Annualized GHG Performance (MTCO2E/MWh)	**0.436**

Sources: BP Watson 2009, including methane (CH_4) and nitrous oxide (N_2O); independent Energy Commission staff analysis for estimated energy output.

Notes:

a. One metric tonne (MT) equals 1.1 short tons or 2,204.6 pounds or 1,000 kilograms.

b. Annualized basis uses the project owner's assumed maximum permitted operating basis.

The proposed project would increase the available energy and capacity to the electricity system. The Los Angeles Basin Local Capacity Requirements Area would benefit from the incremental increase in energy and capacity provided by the BP Watson project. As a project currently located inside a major load pocket, the BP Watson project would be likely to provide local reliability support and could facilitate the retirement of other less-efficient power plants.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Staff assesses the cumulative effects of GHG emissions caused by both construction and operation. As the name implies, construction impacts result from the emissions occurring during the construction of the project. The operation impacts result from the emissions of the proposed project during operation. Staff is continuing to monitor development of AB 32 Scoping Plan implementation efforts and general trends and developments affecting GHG regulation in the construction and electricity sectors.

The impact of GHG emissions caused by this natural gas-fired facility is characterized by considering how the power plant would affect the overall electricity system. The integrated electricity system depends on fossil-fueled generation resources to provide energy and satisfy local capacity needs. As directed by the OII (CEC 2009a), staff is refining and implementing the concept of a “blueprint” that describes the long-term role of fossil-fueled power plants in California’s electricity system. The five separate roles that gas-fired power plants are most likely to fulfill in the future of a high-renewables, low-GHG system include: 1) Intermittent generation support; 2) Local capacity requirements; 3) Grid operations support; 4) Extreme load and system emergencies support; and 5) General energy support (CEC 2009b, p. 93). BP Watson is analyzed here for its role in providing local capacity and generation and general energy support for expected generation retirements or replacements.

Construction Impacts

Staff believes that the small GHG emission increases from construction activities would not be significant for several reasons. First, the period of construction will be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures that staff recommends to address criteria pollutant emission, such as limiting idling times and requiring, as appropriate, equipment that meets the latest criteria pollutant emissions standards would further minimize greenhouse gas emissions to the extent feasible. The use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of future ARB regulations to reduce GHG from construction vehicles and equipment.

Direct/Indirect Operation Impacts And Mitigation

New, efficient, natural gas-fired generation promotes the state’s efforts to improve GHG electrical generation efficiencies and, therefore, reduces greenhouse gas emissions and the amount of natural gas used by electricity generation. As the *2007 Integrated Energy Policy Report* (CEC 2007, p. 184) noted:

> New natural gas-fueled electricity generation technologies offer efficiency,

> environmental, and other benefits to California, specifically by reducing the amount of natural gas used—and with less natural gas burned, fewer greenhouse gas emissions. Older combustion and steam turbines use outdated technology that makes them less fuel- and cost-efficient than newer, cleaner plants.… The 2003 and 2005 IEPRs noted that the state could help reduce natural gas consumption for electric generation by taking steps to retire older, less efficient natural gas power plants and replace or repower them with new, more efficient power plants.

Thus, in the context of the Energy Commission's *Integrated Energy Policy Report*, the BP Watson project's likely replacement of older existing plant capacity and higher GHG-emitting energy furthers the state's strategy to promote efficiency and reduce fuel use and GHG emissions. As stated in the 2009 *Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California* (CEC 2009b, p.20):

> When one resource is added to the system, all else being held equal, another resource will generate less power. If the new resource has a lower cost or fewer emissions than the existing resource mix, the aggregate system characteristics will change to reflect the cheaper power and lower GHG emissions rate.

Net GHG emissions for the integrated electric system will decline when new gas-fired power plants are added to: 1) permit the penetration of renewable generation to the 33% target; 2) improve the overall efficiency of the electric system; or 3) serve load growth or capacity needs more efficiently than the existing fleet (CEC 2009b, p. 98). The BP Watson project, with its lower heat rate than the existing Los Angeles Basin Local Capacity Requirements Area power plants that it would displace and most other dispatchable gas-fired generation in the state, would be more efficient and lower GHG-emitting than the existing fleet, as shown in **Greenhouse Gas Table 4**.

Greenhouse Gas Table 4
Los Angeles Basin Local Capacity Requirements Area, Local Generation Heat Rates and 2008 Energy Outputs

Plant Name	Heat Rate (Btu/kWh)[a]	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Watson Cogeneration (existing)	8,512	3,017	0.452
Corona Cogen	9,430	274	0.500
Civic Center	9,447	467	0.501
San Gabriel	9,859	155	0.523
THUMS	10,123	379	0.537
ARCO Products Co	10,140	477	0.538
Harbor Cogeneration Co	10,649	44	0.565
Alamitos	10,782	2,533	0.572
Huntington Beach (AES)	10,927	1,536	0.580
El Segundo Power	11,044	508	0.586
Carson Cogeneration Co	11,513	540	0.611
Redondo Beach LLC (AES)	11,726	317	0.622
Total Energy Facilities	12,281	137	0.652
Torrance Refinery	12,370	161	0.656
Long Beach Generation LLC	15,323	27	0.813
UCLA Energy Systems Facility	15,418	206	0.818

BP West Coast Wilmington Calciner	16,953	201	0.900
BP Watson project	7,989	708	0.436

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER); with independent Energy Commission staff analysis for BP Watson based on maximum utilization.

Notes:

a. Based on the Higher Heating Value or HHV of the fuel.

b. Peaker facilities

The Role of the BP Watson project in Local Generation Displacement

The proposed BP Watson project would have a net heat rate of 7,989 Btu/kWh[9] under normal operating conditions. The heat rate, energy output and GHG emissions of local generation resources near the BP Watson project are listed in **Greenhouse Gas Table 4**. Compared to most other new and existing units in the Los Angeles Basin Local Capacity Requirements Area, the BP Watson project would be more efficient, and emit fewer GHG emissions per MWh of generation. Local generating units with the best (lowest) heat rate or lowest GHG performance factor generally operate more than other units with higher heat rates, as shown by the relative amount of energy (GWh) produced in 2008 from the local units. However, dispatch order can change, or deviate from economic or efficiency dispatch, in any one year or due to other concerns such as permit limits, contractual obligations, local reliability needs or emergencies. Because the BP Watson project would be inside the Los Angeles Basin Local Capacity Requirements Area, it would be able to provide capacity during most system operating conditions.

The Role of the BP Watson project in the Renewable Goals/Load Growth

As California moves towards an increased reliance on renewable energy, the bulk of renewable generation available to and used in California in the near to intermediate future will be intermittent wind generation with some intermittent solar (CEC 2009b, p.3). To accommodate the increased variability in generation due to increasing renewable penetration, compounded by increasing load variability, control authorities such as the California Independent System Operator (CAISO) need increased flexibility from other generation resources such as hydro generation, dispatchable pump loads, energy storage systems, and fast ramping and fast starting fossil fuel generation resources (CAISO 2007, p. 14).

The BP Watson project would not provide flexible, dispatchable or fast ramping[10] power. The BP Watson project will be a base loaded cogeneration facility that operates up to 24 hours per day, 7 days per week in response to steam demands at the refinery. The BP Watson project will not be dispatched. The GE 7EA CTG ramp rate will be less than 10 MW per minute.[11]

[9] Based on the High Heating Value (HHV) of the fuel(s) used. HHV is used for all heat rate and fuel conversions to GHG mass emissions that are discussed in this document.

[10] The CAISO categorizes *fast-ramping* as a generator capable of going from lowest power to highest in under 20 minutes, or greater than 10 MW per minute.

[11] Of the 2,821 MW of thermal resources providing Ancillary Services to the CAISO, most (2,441 MW) have ramp rates between 10 and 31 MW/min. The bulk of the resources providing Ancillary Services with ramp rates greater than 10 MW/min (7,141 MW) are hydroelectric facilities (ISO 2007).

The amount of dispatchable fossil fuel generation used as regulation resources, fast ramping resources, or load following or supplemental energy dispatches will have to be significantly increased due to the planned intermittent resources needed to meet the 20% RPS (CAISO 2007, p.113); the 33% RPS will require even more dispatchable generation to integrate the renewables. However, the BP Watson project will not be able to provide this service due to the steam needs of the refinery at which it would be located.

Greenhouse Gas Table 5 shows how the build-out of either the 20% or the 33% Renewable Portfolio Standards will affect generation from new and existing non-renewable resources. Should California reach its goal of meeting 33% of its retail demand in 2020 with renewable energy, non-renewable, most likely fossil-fueled, energy needs will fall by more than 36,500 GWh/year. In other words, all growth will need to come from renewable resources to achieve the 33% RPS, and some existing and new fossil units will generate less energy than they currently do, given the expected growth rate in retail sales. The BP Watson project would not contribute to meeting the renewables goal.

Greenhouse Gas Table 5
Estimated Changes in Non-Renewable Energy Potentially Needed to Meet California Loads, 2008-2020

California Electricity Supply	**Annual GWh**	
Statewide Retail Sales, 2008, estimated [a]	264,794	
Statewide Retail Sales, 2020, forecast [a]	289,697	
Growth in Retail Sales, 2008-20	24,903	
Growth in Net Energy for Load [b]	29,840	
California Renewable Electricity	**GWh @ 20% RPS**	**GWh @ 33% RPS**
Renewable Energy Requirements, 2020 [c]	57,939	95,600
Current Renewable Energy, 2008	29,174	
Change in Renewable Energy-2008 to 2020 [c]	28,765	66,426
Resulting Change in Non-Renewable Energy	176	(36,586)

Source: Energy Commission staff 2010.

Notes:

a. 2009 IEPR Demand Forecast, Form 1.1c. Excludes pumping loads for entities that do not have an RPS.

b. 2009 IEPR Demand Forecast, Form 1.5a..

c. RPS requirements are a percentage of retail sales.

These assumptions are conservative in that the forecasted growth in retail sales assumes that the impacts of planned increases in expenditures on (uncommitted) energy efficiency are already embodied in the current retail sales forecast.[12] Energy Commission staff estimates that as much as 18,000 GWh of additional savings due to

[12] Energy efficiency savings are already represented in the current Energy Commission demand forecast adopted December 2009 (CEC 2009c).

uncommitted energy efficiency programs may be forthcoming.[13] This would reduce non-renewable energy needs by a further 12,000 GWh given a 33% RPS.

The Role of the BP Watson project in Retirements/Replacements

The BP Watson project would be capable of annually providing 708 GWh of natural gas/refinery gas-fired energy at permitted levels to replace resources that are or will likely be precluded from serving California loads. State policies, including GHG goals, are discouraging or prohibiting new contracts and new investments in high GHG-emitting facilities such as coal-fired generation, generation that relies on water for once-through cooling, and aging power plants (CEC 2007). Some of the existing plants that are likely to require significant capital investments to continue operation in light of these policies may be unlikely to undertake the investments and will retire or be replaced.

Replacement of High GHG-Emitting Generation

High GHG-emitting resources, such as coal, are effectively prohibited from entering into new contracts for California electricity deliveries as a result of the Emissions Performance Standard adopted in 2007 pursuant to SB 1368. Between now and 2020, more than 18,000 GWh of energy procured by California utilities under these contracts will have to reduce GHG emissions or be replaced; these contracts are presented in **Greenhouse Gas Table 6**.

Greenhouse Gas Table 6
Expiring Long-term Contracts with Coal-fired Generation 2009 – 2020

Utility	Facility [a]	Contract Expiration	Annual GWh Delivered to CA
PG&E, SCE	Misc In-state Qual. Facilities [a]	2009-2019	4,086
LADWP	Intermountain	2009-2013	3,163 [b]
City of Riverside	Bonanza, Hunter	2010	385
Department of Water Resources	Reid Gardner	2013 [c]	1,211
SDG&E	Boardman	2013	555
SCE	Four Corners	2016	4,920
Turlock Irrigation District	Boardman	2018	370
LADWP	Navajo	2019	3,832
		TOTAL	18,522

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.
Notes:
a. All facilities are located out-of-state except for the Miscellaneous In-state Qualifying Facilities.
b. Estimated annual reduction in energy provided to LADWP by Utah utilities from their entitlement by 2013.
c. Contract not subject to Emission Performance Standard, but the Department of Water Resources has stated its intention not to renew or extend.

[13] See *Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast* (CEC-200-2010-001-D, January, 2010), page 2. Table 1 indicates that additional conservation for the three investor-owned utilities may be as high as 14,374 GWh. Increasing this value by 25% to account for the state's publicly-owned utilities yields a total reduction of 17,967 GWh.

This represents almost half of the energy associated with California utility contracts with coal-fired resources that will expire by 2030. If the State enacts a carbon adder[14], all the coal contracts (including those in **Greenhouse Gas Table 6**, which expire by 2020, and other contracts that expire beyond 2020 and are not shown in the table) may be retired at an accelerated rate as coal-fired energy becomes uncompetitive due to the carbon adder or the capital needed to capture and sequester the carbon emissions. Also shown are the approximate 500 MW of in-state coal and petroleum coke-fired capacity that may not be able to contract with California utilities for baseload energy due to the SB1368 Emission Performance Standard. As these contracts expire, new and existing generation resources will replace the lost energy and capacity. Some will come from renewable generation; some will come from new and existing natural gas fired generation. All will emit significantly less GHG than the coal and petroleum coke-fired generation, which average about 1.0 MTCO2/MWh without carbon capture and sequestration, or almost three times more than a natural gas-fired turbine project like the BP Watson project, resulting in a significant net reduction in GHG emissions from the California electricity sector.

Retirement of Generation Using Once-Through Cooling

New resources like the BP Watson project would also be required to provide generation capacity in the likely event that facilities utilizing once-through cooling (OTC) are retired. The State Water Resources Control Board (SWRCB) has proposed significant changes to OTC units, which would likely require retrofit, retirement, or significant curtailment of dozens of generating units. In 2008, these units collectively produced about 58,000 GWh. While those OTC facilities owned and operated by utilities and recently-built combined cycles may well install dry or wet cooling towers, it is unlikely that the aging, merchant plants will do so. Most of these units operate at low capacity factors, suggesting a limited ability to compete in the current electricity market. Although the timing would be uncertain, new resources would out-compete aging plants and would displace the energy provided by OTC facilities and likely accelerate their retirements.

Any additional costs associated with complying with the SWRCB regulation would be amortized over a limited revenue stream today and into the foreseeable future. Their energy and much of their dispatchable, load-following capability will have to be replaced. These units constitute over 15,000 MW of merchant capacity and 17,800 GWh of merchant energy. Of this, much but not all of the capacity and energy are in local reliability areas, requiring a large share of replacement capacity – absent transmission upgrades – to locations in the same local reliability area. **Greenhouse Gas Table 7** provides a summary of the statewide utility and merchant energy supplies affected by the OTC regulations.

New generation resources that can either provide local support or energy will emit significantly less GHGs than existing OTC natural gas generation. Existing aging and OTC natural gas generation averages 0.6 to 0.7 MTCO2/MWh, which is less efficient

[14] A carbon adder or carbon tax is a specific value added to the cost of a project per ton of associated carbon or carbon dioxide emissions. Because it is based on, but not limited to, actual operations and emission and can be trued up at year end, it is considered a simple mechanism to assign environmental costs to a project.

and higher GHG emitting, than a new, natural gas-fired turbine project like the BP Watson project. When a project can provide energy and capacity, given its location, it can provide a significant net reduction in GHG emissions from the California electricity sector. A project located in a coastal load pocket, like the Los Angeles Local Reliability Area, would more likely provide local reliability support as well as facilitate the retirement of aging and/or OTC power plants. The BP Watson project will contribute to meeting the goal of replacing facilities that use once through cooling.

Greenhouse Gas Table 7
Aging and Once-Through Cooling Units: 2008 Capacity and Energy Output [a]

Plant, Unit Name	Owner	Local Reliability Area	Aging Plant?	Capacity (MW)	2008 Energy Output (GWh)	GHG Performance (MTCO2/MWh)
Diablo Canyon 1, 2	Utility	None	No	2,232	17,091	Nuclear
San Onofre 2, 3	Utility	L.A. Basin	No	2,246	15,392	Nuclear
Broadway 3 [b]	Utility	L.A. Basin	Yes	75	90	0.648
El Centro 3, 4 [b]	Utility	None	Yes	132	238	0.814
Grayson 3-5 [b]	Utility	LADWP	Yes	108	150	0.799
Grayson CC [b]	Utility	LADWP	Yes	130	27	0.896
Harbor CC	Utility	LADWP	No	227	203	0.509
Haynes 1, 2, 5, 6	Utility	LADWP	Yes	1,046	1,529	0.578
Haynes CC	Utility	LADWP	No	560	3,423	0.376
Humboldt Bay 1, 2 [a]	Utility	Humboldt	Yes	107	507	0.683
Olive 1, 2 [b]	Utility	LADWP	Yes	110	11	1.008
Scattergood 1-3	Utility	LADWP	Yes	803	1,327	0.618
Utility-Owned				7,776	39,988	0.693
Alamitos 1 – 6	Merchant	L.A. Basin	Yes	1,970	2,533	0.661
Contra Costa 6, 7	Merchant	S.F. Bay Area	Yes	680	160	0.615
Coolwater 1-4 [b]	Merchant	None	Yes	727	576	0.633
El Segundo 3, 4	Merchant	L.A. Basin	Yes	670	508	0.576
Encina 1-5	Merchant	San Diego	Yes	951	997	0.674
Etiwanda 3, 4 [b]	Merchant	L.A. Basin	Yes	666	848	0.631
Huntington Beach 1, 2	Merchant	L.A. Basin	Yes	430	916	0.591
Huntington Beach 3, 4	Merchant	L.A. Basin	No	450	620	0.563
Mandalay 1, 2	Merchant	Ventura	Yes	436	597	0.528
Morro Bay 3, 4	Merchant	None	Yes	600	83	0.524
Moss Landing 6, 7	Merchant	None	Yes	1,404	1,375	0.661
Moss Landing 1, 2	Merchant	None	No	1,080	5,791	0.378
Ormond Beach 1, 2	Merchant	Ventura	Yes	1,612	783	0.573
Pittsburg 5-7	Merchant	S.F.Bay	Yes	1,332	180	0.673
Potrero 3	Merchant	S.F.Bay	Yes	207	530	0.587
Redondo Beach 5-8	Merchant	L.A. Basin	Yes	1,343	317	0.810
South Bay 1-4	Merchant	San Diego	Yes	696	1,015	0.611
Merchant-Owned				15,254	17,828	0.605
Total In-State OTC				23,030	57,817	

Source: Energy Commission staff based on Quarterly Fuel and Energy Report (QFER) filings.

Notes:

a. OTC Humboldt Bay Units 1 and 2 are included in this list. They must retire in 2010 when the new Humboldt Bay Generating Station (not ocean-cooled), currently under construction, enters commercial operation.

b. Units are aging but are not OTC.

c. The Los Angeles Department of Water and Power (LADWP) reported a 2007 aggregate energy number of 4,003 GWh for all the Haynes units. Staff allocated the energy among the units based upon current and historical LADWP filings for the 2009 IEPR.

CUMULATIVE IMPACTS

Cumulative impacts are defined as “two or more individual effects which, when considered together, are considerable or . . . compound or increase other environmental impacts” (CEQA Guidelines § 15355). “A cumulative impact consists of an impact that is created as a result of a combination of the project evaluated in the EIR together with other projects causing related impacts” (CEQA Guidelines § 15130[a][1]). Such impacts may be relatively minor and incremental, yet still be significant because of the existing environmental background, particularly when one considers other closely related past, present, and reasonably foreseeable future projects.

This entire assessment is a cumulative impact assessment. The project alone would not be sufficient to change global climate, but would emit greenhouse gases and therefore has been analyzed as a potential cumulative impact in the context of existing GHG regulatory requirements and GHG energy policies.

COMPLIANCE WITH LORS

Ultimately, ARB’s AB 32 regulations may address both the degree of electricity generation sector emissions reductions (through cap-and-trade), and the method by which those reductions will be achieved (e.g., through command-and-control). However, the exact approach is currently under development. That regulatory approach may address emissions not only from the newer, more efficient, and lower emitting facilities licensed by the Commission, but also the older, higher-emitting facilities not subject to Energy Commission jurisdiction. This programmatic approach is likely to be more effective in reducing GHG emissions overall from the entire electricity sector than one that merely relies on displacing out-of-state coal plants (“leakage”) or older, “dirtier” facilities.

The Energy Commission and the Public Utilities Commission provided recommendations (CPUC 2008) to ARB on how to achieve such reductions through both programmatic and regulatory approaches and identified the regulation points should ARB decide that a multi-sector cap-and-trade system is warranted. As ARB codifies improved GHG inventories and methods, it may become apparent that emission reductions from the generation sector are less cost-effective than other sectors, and that other sectors of sources can achieve reductions with relative ease and cost-effectiveness.

The project would be subject to ARB’s mandatory reporting requirements and potentially other future requirements mandating compliance with AB 32 that are being developed by ARB. How the project would comply with these ARB requirements is speculative at this time, but compliance would be mandatory. The ARB’s mandatory GHG emissions reporting requirements do not indicate whether the project, as defined, would comply with the potential GHG emissions reduction regulations being formulated under AB 32. The project may have to provide additional reports and GHG reductions, depending on the future regulations expected from ARB. Similarly, this project would be subject to federal mandatory reporting of GHG emissions.

Reporting of GHG emissions would enable the project to demonstrate consistency with the policies described above and the regulations that ARB adopts and to provide the information to demonstrate compliance with any future AB 32 requirements that could be enacted in the next few years. Since this power project would be permitted for more than a 60% annual capacity factor, the project is subject to the requirements of SB 1368 and the current Emission Performance Standard. The BP Watson project's GHG emission performance would be well below the SB 1368 EPS. Source testing will be conducted to demonstrate compliance with the GHG performance standards.

The Energy Commission established a precedent decision in the Final Commission Decision for the Avenal Energy Project. This precedent decision requires all new natural gas fired power plants certified by the Energy Commission to: (a) not increase the overall system heat rate for natural gas plants, (b) not interfere with generation from existing renewable facilities nor interfere with the integration of new renewable generation, and (c) take into account these factors to ensure a reduction of systemwide GHG emissions and support the goals and policies of AB 32 (CEC 2009e). The proposed project, with its low heat rate, would meet conditions (a) and (c). As a base load facility, the BP Watson project would not meet condition (b) by potentially interfering with renewable integration; however, given the project's location in a heavy load pocket, the need to provide the refinery with a reliable steam source, and significantly reducing the possibility of refinery upsets due to loss of steam or power, it is unlikely that the project would result in any measurable interference with renewable generation.

NOTEWORTHY PUBLIC BENEFITS

Electricity is produced by operation of inter-connected generation resources and by knowing the fuel used by the generation sector, the resulting GHG emissions can be known. Operation of one power plant, like the BP Watson project, affects all other power plants in the interconnected system. The operation of BP Watson facility will have an impact upon system operation and GHG emissions in several ways:

- The BP Watson project would facilitate to some degree the replacement of high GHG emitting (e.g., out-of-state coal) electricity generation that must be phased out to meet the State's new Emissions Performance Standard.
- The BP Watson project could facilitate to some extent the replacement of generation provided by aging and once-through cooling power plants.
- The BP Watson project would help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

The BP Watson project would not provide flexible, dispatchable power necessary to integrate some of the growing generation from intermittent renewable sources, such as wind and solar generation. It would be used in a base load mode of operation to provide for onsite process steam needs. Because the facility is not dispatchable, it would also not provide for peaking capacity needs identified by Southern California Edison (SCE), the Energy Commission, the California Public Utilities Commission (CPUC), and the

California ISO for the Los Angeles Basin Local Capacity Requirements Area. Also, the BP Watson project would utilize the General Electric Power Systems (GE) 7EA CTG that does not allow for fast startup and ramping capability. However, the high reliability of the BP Watson facility would significantly reduce the possibility of refinery upsets due to loss of steam or power.

Despite the lack of dispatchability, as a new increment of power production the project would provide competitively priced electricity in the form of baseload energy, and ancillary services for sale to electric service providers to help meet expected electrical demand growth in Southern California.

The project would likely lead to a net reduction in GHG emissions across the electricity system providing energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state's power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. Moreover, it would be consistent with AB 32 goals.

The BP Watson project would result in a reduction in GHG emissions from the electricity system. In other system roles, as described in **Greenhouse Gas Table 8**, the BP Watson project would minimize its GHG impacts by addressing nearly all of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system.

Greenhouse Gas Table 8
BP Watson project, Summary of Role in Providing Energy and Capacity Resources

Services Provided by Generating Resources	Discussion, BP Watson
Integration of Renewable Energy	• *Would not* provide fast startup capability (within 2 hours). • *Would not* provide rapid ramping capability. • Would have ability to provide regulation and reserves, and energy when renewable resources are unavailable.
Local Generation Displacement	• Would be able to satisfy/partially satisfy local capacity area (LCA) resource requirements. • Would provide voltage support. • *Would not* provide black start capability.
Ancillary Services, Grid System, and Emergency Support	• *Would not* provide fast startup capability (within 2 hours). • *Would not* have low minimum load levels. • *Would not* provide rapid ramping capability. • Would have ability to provide regulation and reserves. • *Would not* provide black start capability.
General Energy Support	• Would provide general energy support. • Could facilitate some retirements and replacements • Would provide cost-competitive energy. • Would be able to help a load-serving entity (LSE) meet resource adequacy (RA) requirements.

Source: Energy Commission staff; based on: Expected Roles for Gas-Fired Generation (CEC2009b, p. 7).

CONCLUSIONS

The BP Watson project, as an addition to the California electricity system, would be an efficient, new, but not dispatchable natural gas-fired turbine power plant that would cause GHG emissions while generating electricity for California consumers. AB 32 emphasizes that GHG emission reductions must be “big picture” reductions that do not lead to “leakage” of such reductions to other states or countries. The project’s GHG emissions per MWh would be lower than those of other power plants and peaking projects that the project would replace and, thus, would contribute to continued improvement of the California and overall Western Electricity Coordinating Council system greenhouse gas (GHG) emissions and GHG emission rate average.

The project would lead to a net reduction in GHG emissions across the electricity system that provides energy and capacity to California. Thus, staff believes that the project would result in a cumulative overall reduction in GHG emissions from the state’s power plants, would not worsen current conditions, and would thus not result in impacts that are cumulatively significant. While BP Watson would also provide potential GHG benefits, it would not address all of the expected future roles for gas-fired generation, in a high-renewables, low-GHG system. However, the high reliability of the BP Watson facility would significantly reduce the possibility of refinery upsets due to loss of steam or power.

Staff notes that mandatory reporting of GHG emissions per federal government and Air Resources Board greenhouse gas regulations would occur, and this would enable the ARB to gather the information needed to regulate the BP Watson project in trading markets if required by the regulations implementing the California Global Warming Solutions Act of 2006 (AB 32). The project may be subject to additional reporting requirements and GHG reduction or trading requirements as these regulations are more fully developed and implemented.

Staff does not believe that the minor GHG emission increases from construction activities would be significant for several reasons. First, the period of construction would be short-term and the emissions intermittent during that period, not ongoing during the life of the project. Additionally, control measures or best practices, that staff recommends such as limiting idling times and requiring, as appropriate, equipment that meet the latest emissions standards, would further minimize greenhouse gas emissions since staff believes that the use of newer equipment will increase efficiency and reduce GHG emissions and be compatible with low-carbon fuel (e.g., bio-diesel and ethanol) mandates that will likely be part of the ARB regulations to reduce GHG from construction vehicles and equipment. For all these reasons, staff concludes that the minor short-term emission of greenhouse gases during construction would be sufficiently reduced and would, therefore, not be significant.

The project would meet the Greenhouse Gases Emission Performance Standard (Title 20, California Code of Regulations, section 2900 et seq.) that applies to utility purchases of base load power from power plants, should the BP Watson facility sell its power to a California electric utility. Any utility that enters into a contract with the BP Watson project would be required to seek a finding that the project meets the EPS based on the operation of the project at that time, under a proposed PPA, and any other conditions that dictate the operation of the BP Watson project. The BP Watson project as currently proposed meets the EPS of 0.500 metric tonnes CO_2 per megawatt-hour, with a rating of 0.436 metric tonnes CO_2 -equivalent per megawatt-hour.

The BP Watson project would be consistent with two of the three main conditions in the precedent decision regarding GHG emissions established by the Avenal Energy Project's Final Energy Commission Decision (not increase the overall system heat rate for natural gas plants and ensure a reduction of systemwide GHG emissions), while the high reliability of the BP Watson facility would significantly reduce the possibility of refinery upsets due to loss of steam or power.

PROPOSED CONDITIONS OF CERTIFICATION

No Conditions of Certification related to greenhouse gas emissions are proposed. The project owner would comply with mandatory ARB GHG emissions reporting regulations (California Code of Regulations, tit. 17, Subchapter 10, Article 2, sections 95100 et. seq.) and/or future GHG regulations formulated by the U. S. EPA or the ARB, such as GHG emissions cap and trade markets.

REFERENCES

ARB 2006. California Air Resource Board. AB 32 Fact Sheets, California Global Warming Solutions Act of 2006 and Timeline (www.arb.ca.gov/cc/cc.htm). September 2006.

ARB 2008. California Air Resource Board. Climate Change, Proposed Scoping Plan a Framework for Change, Pursuant to AB 32. Released October 2008, approved December 2008. http://www.arb.ca.gov/cc/scopingplan/document/scopingplandocument.htm.

CalEPA 2006. California Environmental Protection Agency. Climate Action Team Report to Governor Schwarzenegger and the Legislature. March 2006.

CEC 1998. California Energy Commission. 1997 Global Climate Change, Greenhouse Gas Emissions Reduction Strategies for California, Volume 2, Staff Report. 1998.

CEC 2003. California Energy Commission. 2003 Integrated Energy Policy Report. December 2003.

CEC 2007. California Energy Commission. 2007 Integrated Energy Policy Report – Scenario Analysis of California's Electricity System. http://www.energy.ca.gov/2007_energypolicy/documents/index.html.

CEC 2009a. California Energy Commission. Committee Report (08-GHG OII-01). Committee Guidance On Fulfilling California Environmental Quality Act Responsibilities For Greenhouse Gas Impacts In Power Plant Siting Applications. March 2009. http://www.energy.ca.gov/ghg_powerplants/documents/index.html.

CEC 2009b. California Energy Commission. Framework for Evaluating Greenhouse Gas Implications of Natural Gas-Fired Power Plants in California, CEC-700-2009-009, MRW and Associates. May 27, 2009.

CEC 2009c. California Energy Commission, 2009 Integrated Energy Policy Report. December 16, 2009. http://www.energy.ca.gov/2009publications/CEC-100-2009-003/CEC-100-2009-003-CMF.pdf.

CEC 2009d – California Energy Commission, 2009. Final Commission Decision for the Avenal Energy Plant (CEC-800-2009-006-CMF, December 2009).

CEC 2009e – California Energy Commission, California Energy Demand 2010-2020 Adopted Forecast. December 2009. http://www.energy.ca.gov/2009publications/CEC-200-2009-012/CEC-200-2009-012-CMF.PDF

CEC 2010 – California Energy Commission, Incremental Impacts of Energy Efficiency Policy Initiatives Relative to the 2009 Integrated Energy Policy Report Adopted Demand Forecast (CEC-200-2010-001-D, January, 2010), http://www.energy.ca.gov/2010publications/CEC-200-2010-001/index.html

CAISO 2007. California Independent System Operator. Integration of Renewable Resources, November 2007.

CPUC 2008. California Public Utilities Commission. Final Opinion on Greenhouse Gas Regulatory Strategies. CPUC and CEC, Joint Agency proposed final opinion, publication # CEC-100-2008-007-D. Posted: September 12, 2008.

BIOLOGICAL RESOURCES

Andrea Martine

SUMMARY OF CONCLUSIONS

The Watson Cogeneration Company (Watson) has proposed the construction of the Watson Cogeneration Steam and Electric Reliability (BP Watson) project on the site of the existing Watson Cogeneration Facility site located in the City of Carson, California. The proposed BP Watson project would consist of adding a fifth combustion turbine generator/heat recovery steam generator and two steam turbine generators. The proposed BP Watson project would complement the existing Watson Cogeneration Facility (Facility) and would provide additional process steam in response to the refinery's process steam demand. The proposed BP Watson project site would occur on a 2.5-acre "brownfield" site which is within the 21.7-acre existing Facility site on a 428-acre parcel. The proposed BP Watson project site occurs in a highly developed and industrial area of Los Angeles County. No improvements to existing water supply, natural gas, or wastewater pipelines would be necessary.

Due to the proposed BP Watson project site's location in a highly disturbed, urbanized, and industrial area, there are no natural or native habitats that provide suitable habitat for protected plant or wildlife species. California Energy Commission staff (staff) has evaluated the potential for impacts to occur to protected biological resources that have the potential to occur during construction and operation of the proposed BP Watson project. There has been past sightings of western burrowing owls in the project vicinity (Watson 2009a). Staff concluded that the potential for direct and indirect construction impacts to western burrowing owls can be reduced to less than significant levels as outlined in staff's proposed Conditions of Certification **BIO-4** (Western Burrowing Owl Impact Avoidance and Minimization Measures). Staff has concluded that due to the lack of biological resources and habitat value at the proposed BP Watson project site and immediate vicinity, the proposed BP Watson project would not have any significant direct, indirect, or cumulative impacts to biological resources with the implementation of staff's proposed conditions of certification.

INTRODUCTION

This section provides staff analysis of potential biological resource impacts from the construction and operation of the BP Watson project in the City of Carson. This analysis would determine if there would be any impacts to state and federally listed species, species of special concern, wetlands, surface waters, and other critical and sensitive areas of biological concern. This analysis presents information regarding the affected biotic environment, the potential environmental impacts to biological resources with the construction and operation of the proposed BP Watson project. Where determined necessary, specific mitigation planning and compensation measures to reduce potential impacts to non-significant levels have been identified. This analysis is based on, in part, on information provided in the Watson Cogeneration Company's Application for Certification (Watson 2009a) for the proposed BP Watson project and staff's observation from ~~an~~ informal, reconnaissance-level site visits of the proposed BP Watson project site and off-site construction staging area performed on October 24, 2009 and May 20, 2010.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The Applicant would need to abide by the following laws, ordinances, regulations, and standards (LORS) during project construction and operation.

Biological Resources Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	**Description**
Federal	
Federal Endangered Species Act (Title 16, United States Code, sections 1531 et seq.; Title 50, Code of Federal Regulations, part 17.1 et seq.)	Designates and provides for the protection of threatened and endangered plant and animal species and their critical habitat. The administering agency is the U. S. Fish and Wildlife Service (USFWS).
Migratory Bird Treaty Act (Title 16, United States Code, sections 703–711)	Prohibits the take or possession of any migratory nongame bird (or any part of such migratory nongame bird), including nests with viable eggs. As defined, this includes nearly every nongame bird in the state. The administering agency is USFWS.
State	
California Endangered Species Act (Fish and Game Code, sections 2050 et seq.)	Protects California's rare, threatened, and endangered species. The administering agency is the California Department of Fish and Game (CDFG).
California Code of Regulations (Title 14, sections 670.2 and 670.5)	Lists the plants and animals that are classified as rare, threatened, or endangered in California. The administering agency is CDFG.
California Public Resources Code (Title 14, sections 670.2 and 670.5)	Lists the plants and animals of California that are declared rare, threatened, or endangered. Administering agency is CDFG.
Fully Protected Species (Fish and Game Code, sections 3511, 4700, 5050, and 5515)	Designates certain bird, mammal, reptile, amphibian, and fish species as fully protected, and prohibits take of such species. The administering agency is CDFG.
Nest or Eggs (Fish and Game Code, section 3503)	Prohibits take, possession, or needless destruction of the nest or eggs of any bird. The administering agency is CDFG.
Migratory Birds (Fish and Game Code, section 3513)	Prohibits take or possession of any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird. The administering agency is CDFG.

Applicable Law	Description
Local	
City of Carson General Plan, Conservation Element and Open Space Element	The City of Carson Planning Department achieves to conserve and enhance its key natural resources including, but not limited to, trees and vegetation, open space, water, and other natural resources. The City of Carson's 2004 General Plan Conservation and Open Space Element outlines goals and policies to provide for the long-term preservation, enhancement, and enjoyment of plant, wildlife, and aquatic resources in the City of Carson by protecting and restoring these resources. The City works to ensure that proposed development projects demonstrate a high degree of compatibility with any threatened or endangered species and sensitive biological resources among other natural resources and environment that occur in the City's jurisdiction and general vicinity.

SETTING

REGIONAL SETTING

The proposed BP Watson project site is located in the City of Carson, approximately five miles north of San Pedro Bay, in the southwestern portion of the Los Angeles Basin. The Los Angeles Basin covers an area that extends from the Santa Monica Mountains to the north, San Gabriel Mountains on the east, the Santa Ana Mountains on the south, and the Pacific Ocean on the west. The proposed BP Watson project site is located in the West Coast Sub-basin of the South Coast Hydrologic Region. The principle drainage feature in the Project vicinity, the Dominguez Channel with primarily rip-rapped banks, is located approximately 0.40 miles to the east which drains approximately 80 square miles west of the Los Angeles River basin. The Dominguez Channel originates southeast of the Los Angeles International Airport and flows southward to the point where it meets the East Channel of the Los Angeles Harbor. Historically, the Los Angeles Basin native habitat included native woodlands, coastal scrubs, chaparral, and grasslands which steadily over time have been replaced by urban development and invasive, non-native vegetation~~ primarily due to urban development~~.

LOCAL

The City of Carson is primarily a mixture of developed and urbanized land uses (RBF Consulting 2002). Residential uses and industrial uses account for more than 80% of developed land in the City limits. Residential housing densities consist of low, moderate, and high dwelling unit densities. Industrial (light and heavy) areas consist of areas that support manufacturing, processing, warehousing, and distribution functions of the community and such facilities are situated for easy access to truck access via highways or railroads.

PROJECT SITE AND VICINITY DESCRIPTION

The proposed BP Watson project site consists of the existing refinery facility which is essentially devoid of vegetation. The proposed BP Watson project site occurs within the boundary of the existing Watson Cogeneration Facility (Facility) at 22850 South Wilmington Avenue, Carson, California and is surrounded by the 405 Freeway and Dominguez Channel to the north, South Alameda Street on the east, East Sepulveda Boulevard on the south, and Wilmington Avenue to the west. The sparse vegetation that is present on-site consists of ruderal invasive species and ornamental plantings. The construction laydown and parking area is located approximately one mile southeast of the proposed BP Watson project site on a paved 25-acre parcel that is currently used as a truck parking and staging area.

Existing Conditions

Power Plant Site, Construction Laydown, and Parking Area.
A biological resources field survey was conducted June 4, 2008 and a reconnaissance-level site visit May 20, 2010. The area surveyed included the cogeneration facility, construction laydown, and parking area. A one mile radius buffer surrounding the proposed BP Watson project site was surveyed for botanical and wildlife resources. The proposed BP Watson project site and surrounding refinery are hardscaped with road base, rock, asphalt, or concrete with no natural vegetation. Plant species observed included ruderal vegetation with very few native species. The construction laydown and parking area is completely devoid of vegetation with contained scattered ruderal plant species along the asphalt berm such as mulefat (*Baccharis salicifolia*), tumbleweeds (*Amaranthus albus*), and ornamental grasses. These plant species and fan palms (*Washingtonia filifera*) were also observed along the dirt access road, which follows the Dominguez Channel east of the Construction Laydown and Parking Area. The only wildlife observed was a rock dove (*Columba livia*) within the proposed project site. There was no evidence of avian breeding activity and no sign of other wildlife such as reptiles or mammals.

Plants and Wildlife

Special-Status Species include those listed as threatened or endangered under the federal or state endangered species acts, species proposed for listing, California species of special concern, other species that have been identified by the US Fish and Wildlife Service (USFWS), California Department of Fish and Game (CDFG), or other agency as unique or rare.

Biological Resources Table 2 identifies the special-status species based on field surveys and searches of CDFG's California Natural Diversity Database (CNDDB) (CDFG 2010) and California Native Plant Society's (CNPS) Inventory of Rare and Endangered Plants (CNPS 2010) for the nine-quad area (641 sq miles) centered on the proposed BP Watson project site. These species may potentially occur within or be impacted by the proposed BP Watson project.

Biological Resources Table 2
Special Status Species Potentially Occurring within Watson Cogeneration Steam and Electric Reliability Project Area

Species	Status* Federal/State/ CNPS	Habitat Description	Potential to Occur in the Project Area
Plants			
Aphanisma (*Aphanisma blitoides*)	__/__/1B.2	Coastal bluff scrub, coastal dunes, and coastal scrub	None
Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*)	FE/__/1B.1	Coastal saltmarsh and brackish waters, salt marsh and wetland	None
Coastal dunes milk-vetch (*Astragalus tener* var. *titi*)	FE/__/1B.1	Coastal bluff scrub and coastal dunes	None
Coulter's saltbush (*Atriplex coulteri*)	__/__/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, valley and foothill grassland in alkaline or clay soils	None
South coast saltscale (*Atriplex pacifica*)	__/__/1B.2	Coastal bluff scrub, coastal dunes, coastal scrub, and playas	None
Parish's brittlescale (*Atriplex parishii*)	__/__/1B.1	Chenopod scrub, playas and vernal pool with alkaline soils	None
Davidson's saltscale (*Atriplex serenana* var. *davidsonii*)	__/__/1B.2	Coastal bluff scrub and coastal scrub	None
Plummer's mariposa-lily (*Calochortus plummerae*)	__/__/1B.2	Chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grassland	None
Intermediate mariposa-lily (*Calochortus weedii* var. *intermedius*)	__/__/1B.2	Chaparral, coastal scrub, valley and foothill grassland	None
Southern tarplant (*Centromadia parryi* ssp. *australis*)	__/__/1B.1	Salt marsh, valley and foothill grassland and vernal pools, alkaline soils	None
Salt marsh bird's-beak (*Cordylanthus maritimus* spp. *maritimus*)	FE/SE/1B.2	Coastal dunes, and salt marshes	None
Catalina crossosoma (*Crossosoma californicum*)	__/__/1B.2	Chaparral and coastal scrub	None
Island green dudleya (*Dudleya virens* spp. *insularis*)	__/__/1B.2	Coastal bluff scrub and coastal scrub	None
Coulter's goldfields (*Lasthenia glabrata* spp. *coulteri*)	__/__/1B.1	Alkali playa, coastal salt marsh, valley and foothill grassland, vernal pool and wetlands	None
Santa Catalina Island desert-thorn (*Lycium brevipes* var. *hassei*)	__/__/1B.1	Coastal bluff scrub and coastal scrub	None
Mud nama (*Nama*	__/__/2.2	Marsh and wetlands	None

stenocarpum)			
Gambel’s water cress (*Nasturtium gambelii*)	FE/ST/1B.1	Brackish marsh, freshwater marsh, and wetlands	None
Spreading navarretia (*Navarretia fossalis*)	FT/__/1B.1	Alkali playa, chenopod scrub, freshwater marsh, vernal pool and wetlands	None
Prostrate vernal pool navarretia (*Navarretia prostrata*)	__/__/1B.1	Coastal scrub, meadows and seeps, valley and foothill grassland with alkaline soils and vernal pools with mesic soils	None
Coast woolly-heads (*Nemacaulis denudata* var. *denudata*)	__/__/1B.2	Coastal dunes	None
California Orcutt grass (*Orcuttia californica*)	FE/SE/1B.1	Vernal pool and wetlands	None
Lyon’s pentachaeta (*Pentachaeta lyonii*)	FE/SE/1B.1	Chaparral (openings), Coastal scrub, valley and foothill grassland in rocky, clay soils	None
Brand’s star phacelia (*Phacelia stellaris*)	FC/__/1B.1	Coastal dunes and scrub	None
Sanford’s arrowhead (*Sagittaria sandfordii*)	__/__/1B.2	Freshwater marsh and ponds	None
Salt spring checkerbloom (*Sidalcea neomexicana*)	__/__/2.2	Alkali playa, brackish marsh, chaparral, coastal scrub, lower montane coniferous forest, alkali springs and marshes Mojavean desert scrub and wetlands	None
Estuary seablite (*Suaeda esteroa*)	__/__/1B.2	Coastal salt marsh	None
San Bernardino aster (*Symphyotrichum defoliatum*)	__/__/1B.2	Cismontane woodland, coastal scrub, lower montane coniferous forest, marsh and swamp, meadow and seep, valley and foothill grassland and wetlands	None
Wildlife	**Status*** **Federal/State/ Other**	**Habitat Description**	
Invertebrates			
Palos Verdes blue butterfly (*Glaucopsyche lygdamus palosverdesensis*)	FE/__	Coastal scrub	None
Fish			
Mohave tui chub (Gila bicolor mohavensis)	FE/SE	Artificial standing and flowing waters	None
Amphibians			
Western spadefoot (*Spea hammondii*)	__/CSC	Vernal pools and wetlands in cismontane woodland, coastal scrub, valley and foothill grasslands	None
Reptiles			
Western pond turtle (*Actinemy marmorata*)	__/CSC	Aquatic, standing or flowing waters, marshes and wetlands	None
Coast horned lizard (*Phrynosoma blainvilli*)	__/CSC	Chaparral, cismontane woodland, coastal bluff scrub, coastal scrub, desert wash, pinyon and juniper woodlands, riparian scrub, riparian woodland, valley and foothill grassland	None
Birds			

Tricolored Blackbird (*Agelaius tricolor*)	__/CSC	Emergent wetland vegetation, especially cattails and tules; also in trees and shrubs	None
Western Burrowing Owl (*Athene cunicularia*)	__/CSC	Rodent burrows in sparse grassland, desert, and agricultural habitats	High: has occurred in the proposed Project site vicinity, last occurrence seen nearby in 2006
Ferruginous hawk (*Buteo regalis*)	__/WL	Open grasslands, sagebrush flats, desert scrub, low foothills surrounding valleys, and fringes of pinyon-juniper habitats	None
Western Snowy Plover (*Charadrius alexandrinus nivosus*)	FT/CSC	Great Basin standing waters, sand shore and wetlands	None
Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)	FC/SE	Riparian forest	None
Southwestern willow flycatcher (*Empidonax trailii extimus*)	FE/SE	Riparian woodland	None
Belding's savannah sparrow (*Passerculus sandwichensis beldingi*)	__/SE	Marshes and wetlands	None
California brown pelican (*Pelecanus occidentalis californicus*)	FE/ FP	coastal salt water, beaches, bays, marshes and on the open ocean	None
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/CSC	Coastal sage scrub/ chaparral	None
Light-footed clapper rail (*Rallus longirostris levipes*)	FE/SE	Coastal salt marsh and wetlands	None
Black skimmer (*Rynchops niger*)	__/CSC	Alkali playa and sandy shores	None
California least tern (*Sternula antillarum browni*)	FE/SE	Sandy soils with little vegetation along the ocean, lagoons, and bays	None
Mammals			
Western mastiff bat (*Eumops perotis californicus*)	__/CSC	Roosts are often found under large exfoliating slabs of granite, sandstone slabs or in columnar basalt, on cliff faces or in large boulders and some in buildings	Low potential to occur on the proposed Project site
Western yellow bat (*Lasiurus xanthinus)*	__/CSC	Dry, thorny vegetation on the Mexican Plateau and in desert regions of the southwest and are particularly associated with palms	None
South coast marsh vole (*Microtus californicus stephensi*)	__/CSC	Tidal marshes	None
San Diego desert woodrat (*Neotoma lepida intermedia)*	__/CSC	Coastal scrub	None
Pocketed free-tailed bat (*Nyctinomops femorosaccus*)	__/CSC	Prefers rock crevices in cliffs as roosting sites, but has been found in caves and in buildings	Low potential to occur on the proposed Project site

Big free-tailed bat (*Nyctinomops macrotis*)	__/CSC	Rock crevices, buildings, caves, and tree hollows	Low potential to occur on the proposed Project site
Pacific pocket mouse (*Perognathus longimembris pacificus*)	FE/CSC	Coastal scrub	None
Southern California saltmarsh shrew (*Sorex ornatus salicornicus*)	__/CSC	Salt marsh	None
American badger (*Taxidea taxus*)	__/CSC	variety of open, arid habitats, but are most commonly associated with grasslands, savannas, mountain meadows, and open areas of desert scrub	None

***-Status Legend** (Federal/State/California Native Plant Society (CNPS) lists, CNPS list is for plants only)/IUCN classification:

Federal FC= Candidate species for listing
FE = Federally listed endangered: species in danger of extinction throughout a significant portion of its range
FT = Federally listed, threatened: species likely to become endangered within the foreseeable future

State CSC = California Species of Special Concern - Species of concern to CDFG because of declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction.
FP = State fully protected
SE = State listed as endangered
ST = State listed as threatened
WL = State watch list

California Native Plant Society
List 1B = Rare, threatened, or endangered in California and elsewhere
List 2 = Rare, threatened, or endangered in California but more common elsewhere
0.1 = Seriously threatened in California (high degree/immediacy of threat)
0.2 = Fairly threatened in California (moderate degree/immediacy of threat)

None of the rare plant species listed in **Biological Resources Table 2** would occur at the proposed BP Watson project site because~~,~~ they were not detected during the 2009 survey, and no habitat exists at the proposed BP Watson project site (Watson 2009a). Of the wildlife species listed in **Biological Resources Table 2** only the western burrowing owl has~~ve~~ potential to occur at the proposed BP Watson project site.

Special Status Wildlife

Western Burrowing Owl (Athene cunicularia)

The western burrowing owl is a small, terrestrial owl of open country. Western burrowing owls favor flat, open grassland or gentle slopes and sparse shrubland ecosystems. These owls prefer annual and perennial grasslands, typically with sparse, or nonexistent, tree or shrub canopies (Clark and Plumpton 2005). In California, western burrowing owls are found in close association with California ground squirrels (Coulombe 1971). Owls use the burrows of ground squirrels and other rodents for shelter and nesting (Martin 1973). Ground squirrels provide nesting and refuge burrows, and maintain areas of short vegetation height, which provide foraging habitat and allow for visual detection of avian predators by burrowing owls (Haug et al. 1993). In the absence of ground squirrel populations, habitats soon become unsuitable for occupancy by owls. Burrowing owls are semi-colonial nesters, and group size is one of the most significant factors contributing to site constancy by breeding burrowing owls (Haug et al. 1993). The nesting season, as recognized by the California Burrowing Owl Consortium (CBOC 1993), is from 1 February through 31 August.

There have been three occurrences of western burrowing owls on the Facility property surrounding the proposed BP Watson project site in the past (Watson 2009a). One occurrence was 0.25-mile southwest of the proposed BP Watson project site at the 503 Reservoir where owls occupied burrows within dirt mounds in the bottom of the reservoir. In 2005 an owl was observed at the stormwater drain in the refinery parking lot north of the proposed BP Watson project site. A third wounded owl was recovered by facility workers in 2006. It was given to the BP Environmental Field Coordinator and taken to a Long Beach rehabilitation center (Watson 2009a). Since 2006, no western burrowing owls have been observed in the proposed BP Watson project vicinity. No suitable habitat or occupied burrows were observed during the field survey. Staff proposes that preconstruction surveys be completed to determine if any western burrowing owls are found at the proposed BP Watson project site.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Staff reviews the best scientific and factual data available for a project to make a determination of whether a project would have a significant effect on biological resources. The biological significance is based primarily on the habitat characteristics of the particular project site under review. Disturbance on a "brownfield" or developed site may not be significant due to lack of biological resources and valuable habitat for special-status species; however, construction on an undeveloped site may result in significant impacts due to the greater ~~higher likelihood~~possibility of biological resources within the area.

Significant impacts to biological resources would occur if special status species are likely to be impacted by construction or operation of the proposed project. Special status species include:

- state- or federally-listed species;
- state Fully Protected species;
- candidates for state or federal listing; and/or
- Species of Special Concern.

Other potential impacts staff considers to be significant include:

- interruption of species migration;
- reduction of native fish, wildlife and plant habitat;
- causing a fish or wildlife population to drop below self-sustaining levels; and

- disturbance of wetlands, marshes, riparian areas, or other wildlife habitat.

Harassment of a protected species regardless of whether or not loss of habitat or reduction in population occurs, and substantial degradation of the quality of the environment or environmental effects that are individually limited, but cumulatively considerable, would also be considered significant. **Biological Resources Table 2** lists the special status biological resources known to occur within 641 sq miles encompassing the project at its center.

DIRECT AND INDIRECT IMPACTS AND MITIGATION

This Preliminary Staff Assessment will discuss and assess impacts to biological resources from BP Watson project site preparation, construction activities, plant operation, maintenance, and closure. Direct impacts result at the same time and place as the project. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the project.

Projects in developed sites typically have less of an impact on sensitive biological resources because they lack suitable habitat on site. However, such projects are evaluated for the impacts they could have on surrounding areas that remain in natural conditions and support sensitive biological resources, primarily in terms of indirect impacts or cumulative impacts.

To avoid and minimize impacts related to western burrowing owls staff recommends Conditions of Certification **BIO-1** through **BIO-3**. The Designated Biologist (see Condition of Certification **BIO-1**) would conduct preconstruction surveys to ensure the safety of western burrowing owls prior to construction if these species are present at the proposed BP Watson project site. The duties and authority of the Designated Biologist are described in staff's proposed Conditions of Certification **BIO-2** (Designated Biologist Duties) and **BIO-3** (Designated Biologist Authority). Conditions of Certification **BIO-1** through **BIO-3** are to ensure protection of sensitive biological resources that may potentially occur at the proposed BP Watson project site prior to construction.

<u>Construction Impacts and Mitigation</u>

Power Plant Site, Construction Laydown, and Parking Area

The proposed Project site is a 2.5-acre developed site located within the existing Facility. Construction laydown and parking area is a paved 25-acre site located approximately one mile southeast of the proposed BP Watson project site and is currently used as a truck parking and staging area. The proposed BP Watson project site and the surrounding refinery are part of the industrial facility and therefore devoid of native vegetation. The proposed BP Watson project site disturbance would be limited to the areas designated for the additional power train and two additional cooling tower cells. The proposed BP Watson project construction laydown and parking area would be used for storage and equipment parking with no ground disturbance.

No off-site improvements (i.e. water supply and discharge, natural gas, and transmission facilities) are associated with the proposed BP Watson project. The proposed project would connect to the existing supply pipelines currently located at the facility. An analysis of the existing transmission system's residual capacity determined that no upgrades to existing transmission lines would be required.

Even though no habitat for wildlife species occurs at the proposed BP Watson project site due to the highly disturbed and developed facility, western burrowing owls may be present. The occasional western burrowing owl has been known to occur in the vicinity of the proposed BP Watson project site. Preconstruction surveys are recommended by staff to avoid impacts to this species.

Western burrowing owls have occurred in the Facility property surrounding the proposed BP Watson project site. They have been observed at the 503 Reservoir, occupying a stormwater drain in the refinery parking and in 2006, a wounded western burrowing owl was taken to a Long Beach rehabilitation center. No owls have been seen in the BP Watson project vicinity since 2006 (Watson 2009a). Although the site itself provides no foraging or nesting habitat value for western burrowing owl, this species still has the potential to occur on the proposed BP Watson project site. Due to the past occurrences of owls in the proposed BP Watson project site vicinity the proposed BP Watson project would potentially have significant impacts during construction activities. Preconstruction surveys for western burrowing owls would be required (see staff's proposed Condition of Certification **BIO-4** Western Burrowing Owl Impact Avoidance and Minimization Measures) to reduce the potential for impacts to this species to a less than significant level.

Light

Construction activities would result in a short-term temporary increase in lighting. Lights can disorient migratory birds flying at night or attract wildlife such as insects and insect-eaters in some cases. Since the project is located within an industrial area in which there is already night lighting from existing surrounding industrial uses and there is no habitat for wildlife, the additional light from the proposed BP Watson project will not adversely affect any local wildlife.

Noise

Construction activities would result in a short-term temporary increase in the ambient noise level. Such activities have the potential to disrupt the nesting, roosting, or foraging activities of local wildlife. However, the existing refineries, intermodal transit yards, several freight rail lines, and other industrial facilities in the immediate vicinity of the proposed BP Watson project site create an elevated ambient noise level to which local wildlife species have acclimated. As such, construction noise will not adversely impact any local wildlife.

Operation Impacts

Potential operation-related impacts include impacts to birds due to collision with the addition of an exhaust stack and disturbance to wildlife due to increased lighting and noise.

Collision

Birds are known to collide with exhaust stacks, and other structures, causing mortality to the birds. The addition of a 100-feet tall exhaust stack would be unlikely to pose a collision risk because of the following: it is shorter than those typically associated with bird collision events (i.e. communication lines with guy wires and tall building with reflective sides), it would not have any lighting, bird densities are already low in the project area due to lack of available habitat to attract birds (i.e. wetlands), and the proposed BP Watson project site is not within a known migratory bird flyway. Therefore, staff concludes that the additional exhaust stack would not pose a significant collision threat beyond the existing cogeneration facility to resident or migratory bird populations.

Light

Existing facilities adjacent to the proposed BP Watson project site provide an elevated ambient level of lighting to which local wildlife, including nocturnal species, have acclimated. Although operation of the proposed BP Watson project would create additional light that will not adversely affect any local wildlife.

Noise

Wildlife species near the proposed BP Watson project site are accustomed to elevated ambient noise levels as a result of the vehicular traffic caused by trucks and rail line operations, existing refineries, intermodal transit yards, several freight rail lines, and other industrial facilities. Although operation of the proposed BP Watson project could create additional noise, it will not adversely impact any local wildlife.

CUMULATIVE IMPACTS

A project could result in a significant cumulative impact where its effects are cumulatively considerable. “Cumulatively considerable” means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, other current projects, and probable future projects (California Code of Regulations, Title 14, Section 15130).

The proposed BP Watson project site would only affect previously developed land in an industrial area and thus does not contain any habitat for sensitive species and there is no habitat surrounding the project site for sensitive species. There would be no impact to habitat suitable to support sensitive species and therefore, staff concludes that the proposed BP Watson project would have no cumulative impacts to biological resources.

COMPLIANCE WITH LORS

This section is based on the laws, ordinances, regulations, and standards (LORS) provided in **Biological Resources Table 1** above. Construction and operation of the proposed BP Watson project would take place entirely within areas previously disturbed for construction and operation, no wildlife habitat exists in these areas, and impacts to wildlife can be avoided by implementation of staff’s proposed conditions of certification, so the proposed BP Watson project would be in compliance with all state, federal, and local LORS related to biological resources during construction and operation.

NOTEWORTHY PUBLIC BENEFITS

Biological resources staff concludes the public benefit of the proposed BP Watson project is that only existing industrial land would be developed and there would not be any significant impacts to sensitive habitats or species if the project is constructed in accordance with staff's proposed conditions of certification.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None Received.

CONCLUSIONS

The proposed BP Watson project is an expansion of the Watson Cogeneration Facility that is located in Carson (Los Angeles County) in southern California which is a developed site. The proposed BP Watson project construction and operation impacts would avoid all biological resources by choosing a location that currently contains no biological resources and is not located near any natural habitat areas. Staff concludes that impacts to western burrowing owls during construction would not occur provided that staff's proposed Conditions of Certification **BIO-4** (Western Burrowing Owl Impact Avoidance and Minimization Measures) is implemented.

Staff concludes that the proposed BP Watson project would not have any significant biological resources impacts and would be built and operated in compliance with all federal, state, and local laws, ordinances, regulations, and standards.

PROPOSED CONDITIONS OF CERTIFICATION

Staff proposes the following Biological Resources conditions of certification:

DESIGNATED BIOLOGIST SELECTION

BIO-1 The project owner shall submit the resume, at least three references and contact information of the proposed Designated Biologist (DB) to the Compliance Project Manager (CPM) for approval.

The Designated Biologist must at least meet the following minimum qualifications:

1. Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field; and
2. Three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society; and
3. At least one year of field experience with biological resources found in or near the project area.

In lieu of the above requirements, the resume shall demonstrate to the satisfaction of the CPM, that the proposed DB or alternate has the appropriate training and background to effectively implement the conditions of certification.

<u>Verification:</u> The project owner shall submit the specified information at least 45 days prior to the start of any site (or related facilities) mobilization. No site or related facility activities shall commence until an approved Designated Biologist is available to be on site.

If a Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least ten working days prior to the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

DESIGNATED BIOLOGIST DUTIES

BIO-2 The project owner shall ensure that the Designated Biologist performs the following during any site (or related facilities) mobilization, ground disturbance, grading, construction, operation, and closure activities. The Designated Biologist may be assisted by the approved Biological Monitor(s), but remains the contact for the project owner and CPM.

1. Advise the project owner's Construction and Operation Managers on the implementation of the biological resources Conditions of Certification;
2. Be available to supervise, conduct, and coordinate mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification;
5. Respond directly to inquiries of the CPM regarding biological resource issues; and
6. Maintain written records of the tasks specified above. Summaries of these records shall be submitted in the Monthly Compliance Report during project construction.

Verification: The Designated Biologist shall submit in the Monthly Compliance Report to the CPM copies of all written reports and summaries that document biological resources activities. If actions may affect biological resources during operation a Designated Biologist shall be available for monitoring and reporting.

DESIGNATED BIOLOGIST AND BIOLOGICAL MONITOR AUTHORITY

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist and Biological Monitor(s) to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist or Biological Monitor(s), the project owner's Construction/Operation Manager shall halt all site mobilization, ground disturbance, grading, construction, and operation activities in areas specified by the Designated

Biologist.

The Designated Biologist or Biological Monitor(s) shall:

1. Require a halt to all activities in any area when determined that there would be an unauthorized adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or would be instituted, as a result of the work stoppage.

Verification: The project owner shall ensure that the Designated Biologist or Biological Monitor notifies the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities [Refer to Comment 4.2.1]. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure would be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner would be notified by the CPM that coordination with other agencies would require additional time before a determination can be made.

WESTERN BURROWING OWL IMPACT AVOIDANCE AND MINIMIZATION MEASURES

BIO-4 The project owner shall implement the following measures to manage their construction site, construction laydown and parking area, in a manner to avoid or minimize impacts to western burrowing owls.

Preconstruction surveys shall be conducted for western burrowing owls for any areas subject to disturbance from construction no less than 14 days prior to the start of initial ground disturbance activities. Surveys shall be conducted by walking the entire project site and in areas within 500 feet of anticipated ground disturbance, construction laydown areas, and parking area. In the event that owls or owl sign are identified during the survey(s), the project owner shall identify the following:

Identify date and time of owl survey visit(s), and map location(s) of owls and owl sign.

If owls are found and need to be relocated, only passive relocation of the owls would occur prior to the start of construction and only during the non-breeding season (September 1 through January 31).

During the breeding season (February 1 through August 31) occupied burrows shall not be disturbed and shall be provided with a 250-foot protective buffer.

<u>Verification:</u> The project owner shall submit a report to CDFG and the CPM at least 10 days prior to ground disturbing activities or construction equipment staging that describes when pre-construction owl survey(s) were completed, duration of the owl survey(s), a map depicting the results of the survey(s), and if owls are present, the measures to be implemented to avoid and minimize impacts to owls in and near the construction and laydown areas. If owls are present, the project owner shall coordinate with CDFG and the CPM to determine adequacy of proposed impact avoidance and minimization measures.

REFERENCES

CBOC (California Burrowing Owl Consortium). 1993. Burrowing Owl Survey Protocol and Mitigation Guidelines. April 1993.

CDFG 2010. California Natural Diversity Data Base (CNDDB). Search of nine 7.5-minute USGS quadrangles centered on the Long Beach 7.5-minute USGS quadrangle. CNDDB RareFind Version 3.1.

Clark, H.O. Jr. & Plumpton, D.L. (2005): A simple one-way door design for passive relocation of Western Burrowing Owls. California Fish and Game 91: 286-289.

Coulombe, H.N. 1971. Behavior and population ecology of the Burrowing Owl, *Speotyto cunicularia*, in the Imperial Valley of California. Condor 73:162-176.

CNPS 2010. California Native Plant Society. 2010. Inventory of Rare and Endangered Plants (online edition, v7-10a). California Native Plant Society. Sacramento, CA. Accessed January 2010 from http://www.cnps.org/inventory.

Haug, E.A., B.A. Millsap, and M.S. Martell. 1993. Burrowing Owl (*Speotyto cunicularia*). In: The Birds of North America, No. 61 (A. Poole and F. Gill [eds.]). Philadelphia: The Academy of Natural Sciences; Washington D.C.: The American Ornithologist's Union.

Martin, D.J. 1973. Selected aspects of Burrowing Owl ecology and behavior. Condor 75:446-456.

RBF Consulting 2002, *City of Carson Public Review Draft, General Plan Environmental Impact Report (Volume II),* October 2002.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I & II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

CULTURAL RESOURCES

Michelle C. Messinger

SUMMARY OF CONCLUSIONS

Staff has concluded that the proposed Watson Cogeneration Steam and Electric Reliability Project (BP Watson) would not have any direct or indirect significant impacts on known historical resources. Over 97% of the 2.5-acre project site has been disturbed through on-going industrial in-fill and industrial operational use, and the physical footprint of the planned fifth turbine to the existing Watson Cogeneration Facility (Facility) would be on existing engineered fill. Therefore, if the project were built as proposed in the Application for Certification, staff anticipates no adverse impact to historical resources.

As part of the procedures and objectives required by CEQA pursuant to Pub. Resources Code sec. 21082, Cal. Code Regs., tit. 14, secs. 15064.5 (f) staff recommends the adoption of Conditions of Certifications **CUL-1** through **CUL-7** for the accidental discovery of historical or unique archaeological resources during construction, and Condition of Certification **CUL-8** to comply with the City of Carson's historic preservation standards. By adopting these conditions of certification any unanticipated discovery of a historical or unique archaeological resource could be mitigated below a level of significance and the BP Watson project would be in conformance with all applicable laws, ordinances, regulations, and standards.

INTRODUCTION

This cultural resources assessment identifies the potential impacts of the BP Watson project on cultural resources. Cultural resources are defined under state law as buildings, sites, structures, objects, and historic districts. Three kinds of cultural resources, classified by their origins, are considered in this assessment: prehistoric, ethnographic, and historic.

Prehistoric archaeological resources are associated with the human occupation and use of California prior to prolonged European contact. These resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 12,000 years ago and extended through the eighteenth century until 1769, when the first Europeans settled in California.

Ethnographic resources represent the heritage of a particular ethnic or cultural group, such as Native Americans or African, European, Latino, or Asian immigrants. They may include traditional resource collecting areas, ceremonial sites, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

Historic-period resources, both archaeological and architectural, are associated with Euro-American exploration and settlement of an area and the beginning of a written historical record. They may include archaeological deposits, sites, structures, traveled ways, artifacts, or other evidence of human activity. Groupings of historic-period resources are also recognized as historic districts and as historic vernacular landscapes. Under federal and state historic preservation law, cultural resources must be at least 50 years old to have the potential to be of sufficient historical importance to merit consideration of eligibility for listing in the California Register of Historical Resources (CRHR). A resource less than 50 years of age must be of exceptional historical importance to be considered for listing.

For the BP Watson project, staff provides an overview of the environmental setting and history of the project area, an inventory of the cultural resources identified in the project vicinity, and an analysis of the potential impacts to cultural resources from the proposed project using criteria from the California Environmental Quality Act (CEQA).

If cultural resources are identified, staff determines which are historically significant (defined as eligible for the CRHR) and whether the BP Watson project would have a significant impact on those that are CRHR eligible. Staff's primary concern is to ensure that all potentially CRHR-eligible cultural resources are identified, that all potential significant impacts to those resources are identified and assessed, and that conditions are proposed that ensure that all significant impacts that cannot be avoided are mitigated to a less-than-significant level.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Projects licensed by the Energy Commission are reviewed to ensure compliance with all applicable laws. For this project, in which there is no federal involvement,[1] the applicable laws are primarily state laws. Although the Energy Commission has pre-emptive authority over local laws, it typically ensures compliance with local laws, ordinances, regulations, standards, plans, and policies (**Cultural Resources Table 1)**.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
State	
Public Resources Code 5097.98(b) and (e)	Requires a landowner on whose property Native American human remains are found to limit further development activity in the vicinity until he/she confers with the Native American Heritage Commission-identified Most Likely Descendents (MLDs) to consider treatment options. In the absence of MLDs or of a treatment acceptable to all parties, the landowner is required to reinter the remains elsewhere on the property in a location not subject to further disturbance.

[1] Cultural resources in California are also protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431, et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act.

Applicable Law	Description
State	
California Health and Safety Code, Section 7050.5	This code makes it a misdemeanor to disturb or remove human remains found outside a cemetery. This code also requires a project owner to halt construction if human remains are discovered and to contact the county coroner.

Cultural Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Local	
Los Angeles County General Plan, 2008	Policy C/OS 12.1: Support an inter-jurisdictional collaborative system that protects and enhances the County's cultural heritage resources. Policy C/OS 12.2: Support the preservation and rehabilitation of historic buildings. Policy C/OS 12.3: Ensure proper notification procedures to Native American tribes in accordance with Senate Bill 18 (2004). Policy C/OS 12.4: Promote public awareness of the County's cultural heritage resources.
City of Carson General Plan, Parks, Recreation, and Human Services Element (City of Carson 2004)	Goal P-9: Protection of historic resources within the City. Policy P-9.1 Promote the preservation of historic resources in the City through the Fine Arts and Historical Commission. Policy P-9.2 Coordinate with the Departments of History and Anthropology at California State University, Dominguez Hills (CSUDH), to mutually enrich both the educational and general communities. Policy P-9.3 Create an oral history program that would archive the City's history from long-time Carson residents. Implementation Measure P-IM-9.1: Encourage the Fine Arts and Historical Commission to work with local historic societies and CSUDH to preserve important historic resources. Work with the City's Public Information Office to promote local and regional historic resources. Implementation Measure P-IM-9.2: Encourage all development or redevelopment occurring in areas identified as a potential historic archaeological site to be surveyed for historic archaeological resources prior to initiation of site preparation for development. Implementation Measure P-IM-9.3: Ensure that documentation of all historic archaeological surveys conducted in the City of Carson be provided to the Planning and Environmental Services Division.

SETTING

Information provided regarding the setting of the proposed project places it in its geographic and geologic context and specifies the technical description of the project. Additionally, the prehistoric, ethnographic, and historical background provides the context for the evaluation of the CRHR eligibility of any identified cultural resources within staff's area of analysis for this project.

REGIONAL SETTING

The proposed BP Watson project area is located in the City of Carson which itself is located in the South Bay/Harbor area of the County of Los Angeles, approximately 13 miles south of downtown Los Angeles. Carson is surrounded by the City of Los Angeles on the northwest, south, and southeast. The City of Compton is adjacent to the northeast, and the City of Long Beach is adjacent to the east. Unincorporated areas of Los Angeles County are located on the north, southwest, and east. The City of Carson is approximately 19.2 square miles in area, making it the eighth largest city in land area within Los Angeles County. Most elevations in the city range from 20 to 40 feet above mean sea level (amsl). With the exception of Dominguez Hill in the northeast area of the city, where elevations reach 179 feet amsl, the city mostly is flat. The city's lowest points are at Del Amo Park with an elevation of five feet below mean sea level (bmsl), and underwater in the Dominguez Channel, with an elevation of almost 15 feet bmsl.

PROJECT, SITE, AND VICINITY DESCRIPTION

The project, as proposed, is an expansion of a steam and electrical generating (cogeneration) facility, which completes the facility's original design. The facility has been in operation for over 20 years. The original plant design included plans for a new unit at a later date and also allocated a physical land parcel for this expansion. The project, an 85-megawatt (MW) combustion turbine generator with a single-pressure heat recovery steam generator (HRSG), also referred to as the fifth train, would provide additional steam for the BP Carson refinery (Watson 2009a, p. 1-1). The steam produced by the fifth train will be delivered to the existing steam header systems shared by the four existing cogeneration trains.

The baseline environmental condition of the project site is one of an industrial development within an urban setting. On the premises of the existing Watson Cogeneration facility, the location of the proposed project, there has been much ground disturbance through extensive development and through dredging and fill activities, in addition to added hardscape and pavement. Overall, the existing topography no longer resembles its original natural environment (Watson 2009a, p. 5.7-4). The project site is surrounded by existing refineries and other industrial infrastructure; the entire project site is zoned by the City of Carson as Heavy Manufacturing. The existing landscape in the vicinity of the planned project is characterized by buildings and structures associated with power generation, and petroleum production, processing, and storage.

The BP Watson project site is located approximately 0.7 mile south of Interstate Route 405, roughly bounded by Wilmington Avenue to the west, East Sepulveda Boulevard to the south, South Alameda Street to the east, and the Dominguez Channel to the north, in an area characterized by oil refineries, warehouses, and railroad infrastructure. The project site is a 2.5-acre brownfield, part of the 21.7-acre Watson Cogeneration facility, which is itself on the 428-acre parcel of the existing Carson Refinery, owned by British Petroleum. The elevation of the project site is approximately 32 feet amsl (Watson 2009a, p. 7-2). Located on the existing refinery property, the proposed project site has been subject to years of heavy industrial development and use. The project footprint is the former location of a crude oil reservoir, which can be identified on aerial photographs as early as 1928. Between 1987 and 1988, most of that reservoir was replaced with asphalt paving (Watson 2009f, DPR 523A, p. 1).

The BP Watson project has two primary components, the project site, where the direct physical improvements would occur, and a construction laydown and parking area. The construction laydown and parking area, a paved 25-acre parcel at 2149 East Sepulveda Boulevard, is approximately one mile southeast of the project site and is currently used as a truck parking and staging area by the Carson Refinery. There would be no ground disturbance on the construction, laydown, and parking area.

The construction excavation planned for the 2.5-acre project site would not be deeper than 10 feet below existing grade. There are no off-site improvements planned for the project, such as water supply, natural gas, or wastewater pipelines. The proposed project would instead connect to the supply pipelines on the extant facility (Watson 2009a, p. 5.7-3). There is presently a maintenance shop/warehouse on a portion of the proposed project site that would be removed prior to project construction. Additional demolition would consist of the removal of known underground man-made structures on the site, such as warehouse foundations, piping systems, and maintenance access roads. Asphalt or asphaltic concrete covers the paved area of the project site, which is at the same level with the existing facilities and would be removed, and approximately 7,000 cubic yards of existing fill material would be removed and stockpiled (Watson 2009a, p. 3-51).

Environmental Setting

Geomorphology and Geology

The project site sits on an alluvial coastal plain, extending north from present-day Los Angeles and the Long Beach harbors (Watson 2009a, p. 5.7-3). The plain is flat and marshy, dominated by two prominences, Dominguez Hill in the north, with an elevation of 179 feet amsl, and the Palos Verde Hills to the southwest, which rise over 1,400 feet amsl. Other than these two landmarks and several small marshy lakes, the Harbor Lakes, the Dominguez Channel, and the Los Angeles River, the plain is featureless, reaching a maximum elevation of 35 to 40 feet amsl.

The plain has developed over a period of 20 million years. The plain originally was submerged under the sea with only the Palos Verde Hills above sea level. The Palos Verde Hills and the Santa Monica Hills were incorporated into a seacoast highland during a time when volcanoes were very active, depositing extensive beds of lava on the floor of the Los Angeles Basin (LA Basin). Today, the floor of the LA Basin contains stratified layers of lava and sediments over 10,000 feet thick. In addition, marine sediments have accumulated on the floors of the Torrance Plain, including the LA

Basin. The formation of the coastal bar occurred during the Pliocene period (dating from 13 million to 2 million years ago), establishing a wide delta at the mouth of the southward-flowing Los Angeles River. The mouth of the Los Angeles River has alternated between a tidal salt water marsh and a fresh water marsh for the last few thousand years and has extended from the present San Pedro Bay shoreline northwards to Sepulveda Boulevard (Watson 2009a, p. 5.7-3).

The project is located in the Peninsular Ranges Geomorphic Province of California, which consist of a series of ranges separated by northwest-trending valleys that are sub-parallel to faults branching from the San Andreas Fault. More specifically, the project is located on the southwest edge of the LA Basin, an alluvial plain created by tectonic subsidence and the subsequent filling by sediments eroded from surrounding mountains. The LA Basin is a coastal plain of low relief that slopes gradually seaward (Watson 2009a, p. 5.3-2). The surface deposits of the project vicinity are identified as late-to-middle Pleistocene alluvial floodplain deposits.

The topographic elevations in the project area range from approximately 20 feet to 35 feet above MSL. The high groundwater level contours indicate groundwater at a depth of approximately 20 feet below the existing ground surface (Watson 2009a, p. 5.3-3).

Pedology

Expansive soils exist on the project site, with the native soils consisting of Zamora and Ramona series soils; however, most soils on the plant site consist of engineered fill material, with native soils below the fill. According to a geotechnical investigation conducted at the Carson Refinery in 1986, the existing fill soils on the plant site are 8.5 to 20 feet in thickness, with the fill consisting of silt and clay, varying from only moderately stiff to stiff. There was no occurrence of subsurface water within the 65-foot depth explored in the study (Watson 2009a, vol. II, app. L, p. 5-6).

Prehistoric Background

California may provide some of the more ancient evidence of the human presence on the North American continent, perhaps dating as early as 30,000 years ago. According to many archaeological researchers, Southern California's prehistory has been divided into a basic four-stage chronology. A chronology in common use today for prehistoric analyses was developed by William Wallace (1955; 1978).

Wallace established a culture history sequence for Southern California in 1955, positing several broad cultural horizons based on changing tool and ornament styles. According to Wallace the four cultural horizons for coastal Southern California are:

Horizon I Early Man	before 7,000 years ago
Horizon II Millingstone	7,000 to 3,500 years ago
Horizon III Intermediate	3,500 to 1,500 years ago
Horizon IV Late Prehistoric	1,500 to historic contact, about 200 years ago

When Wallace developed the Horizon I Early Man chronology he assumed a late Pleistocene occupation, but no artifact finds had substantiated this assumption in 1955. However, since then, Clovis-style fluted projectile points at least 11,000 years old (dated through radiocarbon testing) have been found in places such as the San Joaquin Valley, the Mojave Desert, and the Tehachapi Mountains, thus providing strong supporting evidence for Wallace's theory of a late Pleistocene occupation (Moratto 1984, pp. 79–88). The Early Man Horizon has been documented in Orange County by a female skeleton known as Laguna Woman, which apparently dates to the Early Man period. Remains such as leaf-shaped knives and scrapers imply that the early tradition seems to have emphasized hunting.

The Millingstone period (Horizon II) is characterized by small groups relying on seasonal settlements, possibly in both coastal and inland residential locations. The assemblages of Millingstone sites are, as the name indicates, characterized by seed grinding tools (manos, metates, and hammerstones); usually in large numbers. In coastal regions, these seed grinding tools are usually found with shell middens, but few projectile points, bone, or shell artifacts have been found in this period (Moratto, 1984, p. 159). The staple foods of this period seemed to have been buckwheat, sage, and other grasses, with less reliance on hunting. The flaked stone tools from this period are commonly coarsely grained, durable lithic materials.

During Horizon III, the Intermediate Culture, the presence of many projectile points and the varied faunal remains show the reliance on both land and sea mammals, clearly distinguishing Horizon III from the Millingstone period. And while shellfish contributed to the diet, fishing, by and large, did not. In addition, during this period a shift occurred from the use of manos and metates to the use of mortars and pestles because of the increased reliance on acorns in the diet. Cremation was one of the diverse forms of burial customs in this period (Moratto 1984, p. 159).

The Late Prehistoric Culture, Horizon IV, is characterized by dense populations and cultural elaboration with a broader material culture, such as more skillfully crafted artifacts, made out of bone and shells, and the use of asphaltum. There was an increase in the use of the bow and arrow in addition to intensive fishing (Moratto, 1985, p.159). In general, Late Prehistoric archaeology today is better understood because of the surviving late nineteenth- and early twentieth-century Native Americans who provided information to early anthropologists beginning to record information about California Native American tribes.

Ethnographic Background

The Gabrielino were the Native Americans associated with the area that today includes the project site and most of Los Angeles and Orange County. "Generally, the Gabrielino territory included the watersheds of the Los Angeles, San Gabriel, and Santa Ana rivers, several smaller intermittent streams in the Santa Monica and Santa Ana mountains, all of the Los Angeles basin, the coast from Aliso Creek in the south to Topanga Creek in the north and the islands of San Clemente, San Nicholas, and Santa Catalina" (Bean and Smith, 1978, p. 538).

The Gabrielino are one of the least well documented of the native peoples of California because they were one of the first groups to suffer the effects of foreign diseases and the influx of foreigners arriving in the region. But ethnographic studies conducted by Alfred Kroeber (1925) and J. P Harrington (1942) and others in the early twentieth century have provided some insight into the culture of the Gabrielino (Bean and Smith, 1978, p. 538). The name “Gabrielino” originates from one of the Los Angeles-area missions, San Gabriel, with which they came to be associated. The other established mission in the region was San Fernando, and most of the Indians living in the coastal regions of Southern California were moved to these two missions (Bean and Smith, 1978, p. 538).

From linguistic studies it has been determined that the Gabrielino language was derived from one of the Cupan languages in the Takic family, and that they and their ancestors migrated from the Great Basin area. Based on linguistic analysis, it is presumed that at one time the entire southern California coastal region was populated by Hokan speakers who were gradually displaced by Takic-speaking immigrants from the Great Basin area. Since the timing and extent of the migrations and their effects on indigenous peoples is not well understood, any data related to it represent a valuable contribution to the understanding of local prehistory (Bean and Smith, 1978). The Gabrielino arrived at the coast around 500 BC.

The Gabrielino occupied one of the richest habitats in all of California, which included four macro-environments: the Interior Mountains/Adjacent Foothills, Prairie, Exposed Coast, and Sheltered Coast (Bean and Smith 1978). The existing abundance of resources provided the Gabrielino with many opportunities to use native plants and animals and, due to the resources contained within the diverse region, develop one of the most complex cultures of any native California groups. The abundance of resources allowed the Gabrielino to settle permanently in small villages throughout the area.

The Gabrielino erected permanent villages in resource-rich areas near rivers and streams, and along the coast, and they founded secondary, or satellite, villages in the vicinity of the permanent ones. The preponderance of named villages around what is now Long Beach Harbor attests to the density of settlement in the area (Watson 2009f, p. 4-3). Ethnographic evidence documents that the village of Sua-nga (Suangna), recorded as archaeological site CA-LAn-98, was located directly southwest of the Carson Refinery.

The traditional dwellings of the Gabrielino were both the subterranean pithouse and the thatched lean-to (wickiup). The pithouse was constructed by excavating about two feet below the surface and constructing the walls and roof with wooden beams and earth around the excavation pit. The wickiup was made out of thatched walls and a thatched roof over large converging poles. A hearth inside the lean-to provided warmth. The cooking hearths were outdoors. *Temescals,* or sweathouses were used as meeting places for the men.

The material culture of the Gabrielino is characterized both by an adaptation to the various environments within their territory and by an elaborately developed artistic style. Their artistic style was often manifested in elaborate shell bead and asphaltum ornamentation on many utilitarian items, such as bone awl handles, bowl or mortar rims, etc. Spear, atlatl and dart, and bow and arrow were used for hunting, while manos and metates, as well as mortars and pestles, were used for processing plant and animal material into food. The Gabrielino were also known for their high quality of basketry work. The Gabrielino weapons consisted of wooden war clubs, sinew-backed bows, tipped (stone or bone) and untipped cane arrows and throwing clubs and slings used for hunting birds and smaller animals.(Bean and Smith, 1978, p. 542)

Historic Background

Spanish Period (1769 to 1821)

The Spanish period in California spans from 1769 to 1821. While California was a Spanish province, it was very sparsely populated by Spanish soldiers, settlers and Catholic missionaries. During this time, California supported a much larger number of Native Americans than in other regions of comparable size in North America north of Mexico (Rawls and Bean, 1968, p. 3). Spanish exploration begun as early as 1540 with Juan Cabrillo's voyage to Monterey Bay in 1542–1543. It was Cabrillo who called what today is known as San Pedro Bay "Bahia de los Fumos" because of the smoke from Native American campfires along the harbor and on the slopes of the Palos Verde Hills (Watson 2009f, p. 4-4). The next Spanish expedition to land near the project area was not until 1602, under the leadership of Sebastian Vizcaino. The Don Gaspar de Portola expedition, which included Father Junípero Serra, the founder of the California missions, crossed the Los Angeles coastal plain in the summer of 1769. At that time, Portola was Military Governor of Alta California, and Juan Jose Dominguez was a soldier in this expedition.

The rancho movement began in 1784 in Los Angeles County and is understood as the settlement of tracts of land by individuals outside pueblo and presidio boundaries. Dominguez, as one of the "veterans, probably around 1784 received permission from Governor Fages to put [his] their cattle on land of their own choosing. It was probably in the fall of 1784 that he drove his herd of horses and 200 head of cattle from San Diego to a site near the mouth of the Los Angeles River. On the slope of a hill he built several huts and corrals and established what came to be known as Rancho San Pedro" (W. W. Robinson, 1979, pp. 46–47).

The founding of the San Gabriel Mission and El Pueblo de Nuestra Señora la Reina de Los Angeles also occurred during the Spanish Period. The San Gabriel Mission was founded in 1771 by Father Serra near present-day Montebello. As religious conversion was one of the pivotal objectives of the missions, the over 25,000 Native American baptisms that took place at San Gabriel speak to the mission's prolific record (Watson 2009f, p. 4-4). It was common practice to remove the Native American converts from their villages and place them in neophyte quarters on the mission grounds. This displacement of the neophytes from their villages and lands occurred across the Los Angeles Basin, including at the Gabrielino village of Suangna. Suangna, which is located less than a mile west of the project site, was at least still partially occupied until the early 1800s. By 1781, due to the successes of the Mission San Gabriel, a new Spanish pueblo was founded 9 miles west of the mission, in the vicinity of San Pedro Harbor. The pueblo was named El Pueblo de Nuestra Señora la Reina de Los Angeles and would evolve into the present day city of Los Angeles.

During the first third of the nineteenth century, ranching became the new way of life. "Native Americans living in the village of Suangna were forced into work as vaqueros, showing that the village of Suangna was still partially inhabited even after the devastation of European colonialization and the mission system" (Watson 2009f, p. 4-5) A major part of the rapid decline of Native American populations must have been linked to the dramatic increase in cattle ranching, causing a substantial change in the local environment through the foraging herds that reduced the green coastal plain to a barren landscape.

Mexican Period (1821 to 1848)

The so-called Mexican Period of California is generally considered to last from 1821 to 1848. In 1810 the Mexican Revolution began but the fact that Mexico had become independent from Spain did not become news in California until 1822. A historic consequence of the independence from Spain was the initiation of the secularization of all the missions of Alta and Baja California. With the church as the predominant land holder in California, secularization released vast amounts of land into new ownership. These lands became the large lands grants awarded to Mexican, European, and American settlers and also provided the basis for new civilian "pueblos."

By 1834 the Mission San Gabriel had been secularized and within 10 years after secularization, the mission had failed, the neophytes had left, and the buildings had fallen into disrepair (Watson 2009f, p. 4-6). By 1852, San Gabriel became one of the first townships in Los Angeles County, with the San Gabriel Mission as a parish.
In 1822, all land grants issued by the Spanish were reconfirmed by the Mexican government, including the San Pedro Rancho land grant. San Pedro Bay developed into a port for passengers and merchandise goods, and the first road was a dirt road connecting the port with the Pueblo of Los Angeles, known as San Pedro Road. A "second road was built from the mission to the port in the 1820s, which later became the route of Wilmington Avenue, passing through the San Pedro Rancho." When the war between the United States and Mexico ended the Mexican Period, the port and the road between the port and Mission San Gabriel were used by General Stockton's troops during the battle of Dominguez Hill (Watson 2009f, p. 4-6).

American Period (1848 to the present)

California became a state in 1850, but it was the Gold Rush of 1849 which brought a huge influx of Americans to California and contributed to the expansion of the Los Angeles area. The Land Act of 1851, a consequence of statehood, required landowners who had received titles to land from either the Spanish or Mexican governments to present and prove the legality of their titles before a U.S. Land Commission. Although Manuel Dominguez's (Juan Jose's heir) title was confirmed in 1858, the Rancho San Pedro was subsequently broken up, and acreage was sold to developers. "One of the sales involved 2,400 acres of property bordering San Pedro Bay which was acquired by Phineas Banning to found the community of Wilmington" (Watson 2009f, p. 4-7).

The next changes within the area resulted from the arrival of the first transcontinental railroad in 1869 in Los Angeles, extending through Rancho San Pedro to reach the San Pedro Harbor. The Southern Pacific added lines between 1869 and 1876, one with a track parallel to Alameda Street. Increased overall developmental growth in the area was due to the arrival of the railroad. By 1870, 2,000 acres of the Rancho San Pedro were sold and subdivided into the Dominguez Colony tract, south of Dominguez Hill and west of the Los Angeles River (Watson 2009f, p. 4-8).

While the time around the 1880s was a boom time of development for the Los Angeles area, with economic advancements, land improvements, and new development, the present-day City of Carson still consisted of lands originally part of the Rancho San Pedro and was characterized by a dry and dusty landscape with minimal vegetation. By 1911, the need for a regular water supply for the expanding agriculture and developing communities resulted in the formation of the Dominguez Water Company, as a subsidiary of the Dominguez Estates Company. “This greatly promoted the development of the southwest portion of present-day Carson, resulting in an increased sale of Rancho San Pedro lands for development and farming” (Watson 2009f, p. 4-9).

A time of heavy flooding causing extensive damage to farms and rural properties occurred between 1914 and 1916, severely inundating the Watson Lakes, which were formerly adjacent to the project area. “During this period, earthen levees were created, as well as raised roadways and railroad tracks, which affected the drainage of the natural environment” (Watson 2009f, p. 4-9).

In 1917 the Dominguez Channel was created by filling the marshes and ponds north of Sepulveda Boulevard and then redirecting the drainages. The work replaced the inundated Watson Lakes with an improved channel (Watson 2009f, p. 4-9). In 1958 work began on the channelization of the Los Angeles River and Compton Creek, which resulted in major alterations of the Dominguez Channel.

The discovery of oil at Signal Hill in 1921 preceded the oil discovery in 1922 on Dominguez Hill (north of the project site). In 1927, Shell Oil had developed the Dominguez Hill site into a refinery, and other sections of the original Rancho San Pedro were sold for oil production. Towards the late 1920s, many oil companies owned former ranch land, and oil prospecting and drilling proliferated.

The pre-WWII development of the present-day Carson area was slow, with the area dominated by agriculture on one end and petroleum processing and production on the other. But after the war, rapid industrial change began to displace the agricultural activities. Around the late 1950s, the Carson area had begun to take on its contemporary form.

The largest physical change in the area (and near the project site) occurred in 1967, when the Dominguez Estate Company offered 1,400 acres of property for $58,500,000. This was considered the biggest real estate offering in the history of Southern California. The land was purchased by the Union Pacific Railroad, Northwestern Mutual, Watson Land Company, the State of California (for the formation of the State College at Dominguez Hill), and others (Jerrils 1972, pp. 83–84). In 1968, the City of Carson was incorporated. It embarked on a number of city activities as much to improve its image as its environment. Significant road widening occurred. For example, in 1968 the road next to the project site, Wilmington Avenue, was widened to four lanes and curbed, and 223rd Street between Wilmington and Alameda was also widened to four lanes (Watson 2009f, p. 4-11).

The BP Watson project site is located in the City of Carson, but historically this area, where petroleum processing had proliferated and tank farms had been built, was part of Los Angeles County. Between 1922 and 1925, Pan American Petroleum established a tank farm just south of the project site. “This tank farm held about 30 tanks capable of storing 2,000 to 150,000 barrels…of gasoline, and the tanks sat on berms constructed of fill.” North of these Pan American tanks were two crude oil reservoirs that were partially removed in the 1980s. “The tank farm in the APE[2] was essentially one of the numerous tank farms in the Carson area” (Watson 2009f, p. 4-11).

Before Carson’s incorporation, much of the area’s land was controlled by many large industrial companies such as Richfield Oil, which became Atlantic Richfield Oil, then ARCO, and then British Petroleum (BP). As BP, this company established an oil refinery in the project’s location. The existing project site was developed between 1951 and 1953, but between 1956 and today, according to the review of photographs and maps, has experienced a huge amount of change and in-fill. The Watson Cogeneration facility, which was built in 1987 and 1988 and consists of four identical combustion turbine generators (CTGs), is located south of the refinery.

Another tank farm, built between 1922 and 1924, called the Carson Terminal, is located directly south of the construction laydown and parking area, east of the Southern Pacific Railroad and Alameda Street, and has been used for over 70 years. Additional tanks were added to the Carson Terminal until the 1980s. In addition, between 1936 and 1957, a refinery was located in the Carson Terminal area (Watson 2009f, p. 4-12).

CULTURAL RESOURCES INVENTORY

A project-specific cultural resources inventory is a necessary step in staff’s effort to determine whether the proposed project may cause significant impacts to historically significant cultural resources and would therefore, under CEQA, have an adverse effect on the environment.

The development of a cultural resources inventory entails working through a sequence of investigatory phases. Generally the research process proceeds from the known to the unknown. These phases typically involve doing background research to identify known cultural resources, conducting fieldwork to collect requisite primary data on not-yet-identified cultural resources in the vicinity of the proposed project, assessing the results of any geotechnical studies or environmental assessments completed for the proposed project site, and compiling recommendations or determinations of historical significance (see “Determining the Historical Significance of Cultural Resources,” below) for any cultural resources that are identified.

This subsection describes the research methods used by the applicant and Energy Commission staff for each phase and provides the results of the research, including

[2] APE stands for Area of Potential Effects, a term used in federal cultural resources analysis. For this study, the equivalent term, under CEQA, is project area of analysis (see below).

literature and records searches (California Historical Resources Information System (CHRIS) and local records), Native American consultation, and field investigations. Staff provides a description of each identified cultural resource, its historical significance, and the basis for its significance evaluation. Assessments of the project's impacts on historically significant cultural resources, potential impacts on previously unidentified, buried archaeological resources, and proposed mitigation measures for all significant impacts are presented in a separate subsection below.

Project Area of Analysis

The inventorying of cultural resources within what staff defines as the appropriate area for the analysis of a project's potential impacts is the first step in the assessment of whether the proposed project may cause a significant impact to a CRHR-eligible cultural resource and therefore have an adverse effect on the environment. The area that staff considers when identifying and assessing impacts to historical resources, called the "area of analysis" for the project, is usually defined as the area within and surrounding the project site and associated linear facility corridors. The area varies in extent depending on whether the cultural resource is an archaeological, ethnographic, or built environment resource.

The project area of analysis is a composite geographic area that accommodates the analysis of each:

- For archaeological resources, the area of analysis is minimally defined as the project site footprint, plus a buffer of 200 feet, and the project linear facilities routes, plus 50 feet to either side of the routes. For its archaeological area of analysis, staff has used the above surface parameters.
- For ethnographic resources, the area of analysis is expanded to take into account traditional use areas and traditional cultural properties which may be far-ranging, including views that contribute to the historical significance of the properties. The Native American Heritage Commission (NAHC) assists project cultural resources consultants and staff in identifying these resources, and consultation with Native Americans and other ethnic or community groups may contribute to defining the area of analysis. For the BP Watson project, staff identified no ethnographic resources.
- For built-environment resources, the area of analysis is minimally defined as one parcel deep from the project site footprint in urban areas, but in rural areas is expanded to include a half-mile buffer from the project site, and from any above-ground linear facilities, to encompass resources whose setting could be adversely affected by industrial development. The area of analysis for the built environment is that minimum.
- For a historic district or a cultural landscape, staff defines the area of analysis based on the particulars of each siting case. No historic districts or cultural landscapes were identified for the BP Watson project.

As used by staff, the term "project areas" means the footprints of the several project components, including the plant site and the laydown and parking area.

Background Inventory Research

Various repositories in California hold compilations of information on the locations and descriptions of cultural resources older than 45 years that have been identified and recorded in past cultural resources surveys. The Energy Commission's Data Adequacy Regulations require applicants to acquire information specific to the vicinity of their project from certain repositories and to provide it to staff as part of the AFC. Additionally, to acquire further information on potential cultural resources in the vicinity of a proposed project, the applicant is required to consult with knowledgeable individuals in local agencies and organizations and with Native Americans who have expressed an interest in being informed about development projects in areas to which they have traditional ties.

CHRIS Records Search

The California Historical Resources Information System (CHRIS) is a federation of 11 independent cultural resources data repositories governed by the California State Office of Historic Preservation. These centers are located around the state, and each holds information about the cultural resources of several surrounding counties. Qualified cultural resources specialists obtain data on known resources from these centers and in turn submit new data from their ongoing research to the centers.

URS, the cultural resources consultant for the BP Watson project, requested an expedited records search from the South Central Coastal Information Center (SCCIC) in Fullerton. The purpose of the search was to identify all previously recorded cultural resources and previous cultural resources investigations completed within a one-mile radius of the project areas. The records search included a review of the California Points of Historical Interests (PHI), the California Historical Landmarks (CHL), the California Register of Historical Resources (CRHR), the National Register of Historic Places (NRHP), the California State Historic Resources Inventory (HRI), and the City of Los Angeles Historic-Cultural Monuments listings.

CHRIS Results

The applicant's CHRIS search identified 45 reports of previous cultural resources investigations known to be or potentially located within 1 mile of the BP Watson project areas (Watson 2009f, p. 5-1). **Cultural Resources Table 2** lists the five reports of investigations covering parts of the project areas.

Cultural Resources Table 2
Previous Cultural Resources Investigations Covering Parts of the BP Watson Project Areas

ID	Author & Date	Title	Type of Investigation
LA2644	Robert J. Wlodarski, 1992	The Results of a Phase I Archaeological Study for the Proposed Alameda Transportation Corridor Project, Los Angeles County, California	Phase I pedestrian archaeological survey and records search

ID	Author & Date	Title	Type of Investigation
LA2751	Beth Padon, 1992	Archaeological Survey Results: Proposed Arco Los Angeles Refinery Clean Fuels Project, Carson, California	pedestrian archaeological survey
LA4512	A.V. Eggers, 1977	Cultural Resources Inventory of the City of Carson, California	archaeological survey & inventory
LA5971	Curt Duke, 2002	Cultural Resources Assessment of AT&T Wireless Services Facility No. 05220A-01, Los Angeles County, California	archaeological survey
LA7952	David M. Livingstone, Dennis McDougall, Susan K. Goldberg, and Wendy M. Nettles, 2006	Trails to Rails: Transformation of a Landscape: History and Historical Archaeology of the Alameda Corridor, Vol.1	Treatment report with DPR 523a forms

Investigation LA2644 (1992) covered the southern and western boundary of the laydown and parking area. The investigation was an archaeological survey of a proposed 20-mile-long transportation corridor.

Investigation LA2751 (1992) covered the entire project plant site. The investigation was a reconnaissance archaeological survey of a previously recorded archaeological site within the BP Carson Refinery. The site, the ethnohistoric Native American village of Suangna, is also a prehistoric archaeological site that formerly consisted of shell midden and burials.

Investigation LA4512 (1977) covered the project areas. The built-environment investigation included preparation of a historic context, walkover survey of undeveloped portions of the city, and the creation of policies and procedures for the city.

Investigation LA5971 (2001) covered the project plant site. The investigation was an archaeological field survey in support of the BP Fifth Train Project at the BP Carson Refinery.

Investigation LA7952 (2006) covered an area alongside the western boundary of the laydown and parking area. The investigation reported on the treatment of historical archaeological resources encountered during construction of the Alameda Corridor.

These reports identified no cultural resources in the BP Watson project areas.

The applicant's CHRIS records search identified 11 cultural resources located within a 1-mile radius of the project areas. Those 11 resources consist of seven archaeological sites and four built-environment resources, none of which is located within the project areas (see **Cultural Resources Table 3**, below). Nor is any of the sites listed on the Archaeological Determination of Eligibility (DOE) list, and no archaeological isolates have been identified within a one-mile radius of the project areas. Brief descriptions of the 11 cultural resources located within one mile of the project areas are provided in **Cultural Resources Table 3**, below.

The records search further identified one California Point of Historical Interest, Suangna Indian Village (Point No. LAN-013), which is located within 500 feet of the project plant site and is counted as an archaeological site in the summary of 11 cultural resources located within one mile of the project areas. The CRHR lists 42 historic properties within a one-mile radius of the project areas that either have been determined eligible for the NRHP or eligible to be listed in it. Additionally, according to the California Historic Resources Inventory (HRI), 57 properties have been evaluated for historical significance within a one-mile radius of the project areas. The CHRIS records search did not produce site forms, reports, or locations for any of the NRHP or HRI resources (Watson 2009a, pp. 5.7-26–5.7-27), but none of them is located in the BP Watson project areas.

Cultural Resources Table 3
Previously Recorded Cultural Resources Located Within One Mile of the BP Watson Project Site, for which Location Data were Available

Primary No.	Trinomial No.	Resource Age	Resource Type
19-000098	LAn-098	Prehistoric	Prehistoric archaeological site, Suangna, Native American village site and shell midden
19-000795	---	Prehistoric	Prehistoric archaeological site, debitage scatter
19-002682	---	Prehistoric	Prehistoric archaeological site, proto-historic midden with more than 25 burials
19-002788	---	Prehistoric	Prehistoric archaeological site, partial human burial
19-0002942	---	Historic	Historic-period archaeological site, 22 subsurface wooden posts, associated with the Southern Pacific Railroad

Primary No.	Trinomial No.	Resource Age	Resource Type
19-003063 (previously assigned 19-003042	---	Historic	Historic-period archaeological site, a 1920s redwood box culvert with contemporary, abandoned oil pipeline
19-003067	---	Historic	Historic-period archaeological site with two un-reinforced concrete features, located where railroad tracks used to be present; most likely associated with the Southern Pacific Railroad
19-180783	---	Historic	Built-environment resource, circa 1905 passenger & railroad depot for Pacific Electric Railway, with a one-story addition from 1920s
19-186868	---	Historic	Built-environment resource, 1920s storage tank facility for oil production
19-187733	---	Historic	Built-environment resource, 1920s storage tank facility for oil production
36-010330	CA-SBR-10330H	Historic	Built-environment resource, Union Pacific Railroad section with standard-gauge trackage and features such as spurs, yards, stations, and sidings

Archival Research

The applicant’s consultant conducted additional primary and secondary research on the history of the project area at the following repositories. The repositories consulted were:

- Los Angeles County Library, Carson Branch;
- City of Carson Planning and Building Departments;
- California State University, Fullerton, Library;
- Los Angeles County Assessor-Recorder;
- Historical Society of Long Beach;
- *Los Angeles Times* photographic archives;
- San Diego State University Library;
- University of California, San Diego, Geisel Library and Mandeville Special Collections; and
- San Diego Public Library.

In addition, various online resources, such as Calisphere: A World of Digital Resources and the California Historic Topographic Map Collection, were consulted. Historic-period aerial photographs were obtained from Environmental Data Resources, Inc.

Archival Research Results

The research results from the literary research, from historic maps and aerial images, were used to provide insight into the historical background of the proposed project site, to refine the historical themes for the historical resources context, and to provide specific information about properties within the project vicinity, but not additional cultural resources were identified as a result of this research.

Local Agency and Organization Consultation

On June 30, 2008, the applicant’s consultant contacted the Wilmington Historical Society and the City of Carson’s Planning Department for information about any known cultural resources, either listed locally or recognized locally, by the city’s museum or by the local historical society.

Results of Inquiries to Local Agencies and Organizations

There was no response from the Wilmington Historical Society. There are no locally listed cultural or historical resources in a 1-mile radius, according to the City of Carson.

Native American Consultation

The Native American Heritage Commission (NAHC) maintains two databases to assist cultural resources specialists in identifying cultural resources of concern to California Native Americans, referred to by staff as Native American ethnographic resources. The NAHC’s Sacred Lands database has records for places and objects that Native Americans consider sacred or otherwise important, such as cemeteries and gathering places for traditional foods and materials. Their Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas. An information request on the presence of sacred lands in the vicinity of a proposed project should be made and a request for a list of Native American contacts should also be made to identify both additional cultural resources and any concerns the Native Americans may have about a proposed project.

On behalf of the applicant, URS contacted the NAHC with a request to search the Native American Sacred Lands File. The NAHC responded on June 16, 2008, that a search of the Sacred Lands File (SLF) for the project area site “failed to indicate the presence of Native American cultural resources in the immediate project area. The absence of specific site information in the Sacred Lands File does not guarantee the absence of cultural resources in any area of potential effect” (Watson 2009f). The NAHC provided a list of seven Native American contacts. URS subsequently contacted these persons.

Results of Inquiries Made to Native Americans

Not all Native Americans contacted by URS responded to the letter or to the follow-up phone calls, but five responses were received. Mr. Qun-tan Shop, of the Chumash Clan, indicated that he would respond via email by the end of the day on July 14, 2008. There appears to be no further response from him.

Mr. Johntommy Rosas, of the Gabrielino/Tongva, Administrator to the Ancestral Territorial Tribal Nation, responded in an email, dated July 12, 2008. Mr. Rosas stated that “we object to the proposed project under the grounds and basis due to numerous of violations to our indigenous rights. This proposed project will impose severe negative impacts on our territorial resources and that is unacceptable.” He stated further that he would provide more comments at a later date. To date, and to staff’s knowledge, no further comments have been received.

Mr. Anthony Morales, Gabrielino/Tongva, San Gabriel Band of Mission Indians, called Mr. Jeremy Hollins, URS, on July 30, 2008, wanting to know about the project’s time line and about the extent of the ground disturbance. Information was provided to Mr. Morales about recent investigations and the excavations associated with the possible construction. Further discussion revolved around the cultural sensitivity of the area and about some of the recent findings discovered from previous projects over the past 20 years. Mr. Morales requested to be involved in future phases of the project.

Mr. Sam Dunlap, Tribal Secretary, of the Gabrielino/Tongva Council, responded in an email dated February 21, 2009, that, due to the proximity of a recorded archaeological site with burials and the project’s close proximity to the Dominguez Channel, the project’s site has an increased potential to contain buried archaeological deposits and human remains and, therefore, may have the potential to create an adverse impact to the cultural resources of his tribe. Mr. Dunlap recommended an archaeological and Native American monitoring component as a mitigation measure with the Native American monitor to be selected from the Gabrielino Tongva Nation.

Mr. Robert Dorame, Tribal Chair/Cultural Resources, Gabrielino/Tongva Indians of California Tribal Council, spoke with URS staff on July 15, 2008, and expressed concern regarding the project and asked to be involved in all future aspects of the project.

In summary, the Native American consultation generally conveyed concern regarding the project's potential to impact buried prehistoric deposits, including burials. Three of the five respondents were concerned about this possibility, and two of them expressed a desire to be kept informed as the project progresses. One recommended construction monitoring. A fourth respondent was severely critical of the project as a trespass on Native American rights. The fifth respondent provided no details of his group's concerns. None of the respondents identified any cultural resources known by them to be located on the proposed project site.

Field Inventory Investigations

The Energy Commission's Data Adequacy Regulations require applicants to conduct surveys to identify previously unrecorded cultural resources in or near their proposed project areas. These surveys include a pedestrian archaeological survey and a built-environment windshield survey. The applicant includes the acquired new survey information as part of the information provided to staff in the AFC and may undertake additional field research, including geoarchaeological studies and site testing, to respond to staff's Data Requests. Staff may also undertake additional field research to supplement information provided by the applicant.

URS conducted two field surveys in conjunction with the BP Watson project: an archaeological field survey and a built-environment field survey using the following methodologies.

Archaeological Field Survey

URS performed an archaeological field survey on July 8, 2008, of the archaeological APE. This survey covered the project site and the laydown and parking area, plus 200 feet beyond all project boundaries. This entire area was inspected on foot, with an interval of less than 10 meters between transects. The survey focused on the inspection of areas of visible soil (most of the project site and the laydown and parking area are covered with extensive hardscape and are paved). Due to restricted access to the adjacent Coke Barn, and because the "vast majority of the Project Site and Construction Laydown and Parking Area are overlain with asphalt, hardscape, gravels and existing structures" (Watson 2009f, p. 6-1) and so could not be surveyed, just a reconnaissance walkover of the construction laydown and parking area was performed.

Results of Pedestrian Archaeological Survey

The pedestrian archaeological survey did not identify any archaeological sites. "Over 97% of the archaeological APE had been previously disturbed and consisted of hardscape, industrial equipment and buildings, and structures used for petroleum production. Overall, virtually no visibility existed within the archaeological APE for the archaeological survey" (Watson 2009f, p. 6-2).

Built-Environment Field Survey

URS conducted an intensive built-environment survey within the built-environment project area of analysis on July 8, 2008, to identify any properties that appeared to be older than 45 years (built in 1963 or earlier). The built-environment project area of analysis extends one parcel's distance from the project area boundary (Watson 2009f,

p. 6-1). The properties that either were older or appeared to be older than 45 years were recorded on Department of Parks and Recreation (DPR) 523 series forms and were evaluated using the criteria of the CRHR for purposes of CEQA. Properties that did not appear to be older than 45 years or were not known to be older than 45 years were not recorded on DPR 523 forms. Where access to a property was restricted or obstructed, existing information for recording the property was used; for the remainder of the survey, public vantage points were used.

Results of the Intensive-Level Survey for Built-Environment Resources

Three properties, one previously recorded and two newly identified, were recorded as potential cultural resources on DPR 523 forms: the BP Carson Refinery, constructed from 1922 to 1925, a portion of the Dominguez Channel, constructed in 1917, and a segment of the Southern Pacific Railroad (36-0101330 or CA-SBR-10330H), constructed from 1869 to 1876. The BP Carson Refinery is located within the project site parcel; the two other properties, a segment of the Southern Pacific railroad and part of the Dominguez Channel, are located within one parcel's distance of the project site.

The BP Carson Refinery

The BP Carson Refinery is located in Los Angeles County in an area that historically was used for petroleum processing and for tank farm petroleum storage. The refinery is situated on approximately 200 acres in an urban setting that is characterized by production, processing, and storage of petroleum products and power generation. The entire property was recorded and evaluated by URS in connection with the preparation of the BP Watson project AFC.

Originally, the BP Carson Refinery was built between 1922 and 1925 as a gasoline tank farm, with approximately 30 tanks and five reservoirs that were used to store crude oil. The facility's layout generally follows an axial plan, with most structures and buildings arranged latitudinally along the northern perimeter of the plant. The parcel is almost entirely covered with hardscape and pavement. Since in-fill has occurred from the 1930s to the present, the refinery's original plan is no longer recognizable.

The oldest portion of the refinery is located immediately south of the proposed project site, but in the past 30 years this area has seen the most change. Originally, the 100,000-barrel, cylindrical, gasoline storage tanks sat on berms constructed of fill. Of the approximately 30 tanks and other associated/ancillary structures, such as pipelines, foundations, and support and scaffolding systems, the majority are not over 45 years old (Watson 2009f, DPR 523L, p. 1).

North of the tank farm is the non-historic cogeneration portion of the refinery, built in 1987 and 1988 and consisting of four identical CTGs that occupy an area of nearly a quarter-mile in size. West of the CTGs is the warehouse that currently is used as a maintenance shop for the CTGs; it is to be replaced by the fifth turbine. The area north of the proposed project site is where the refinery operation occurs. While this space was first developed between 1951 and 1953, with additional heavy in-fill from 1956 to the present, and some of the early structures are still extant, most of the original structures have been surrounded by new in-fill, and the original circulation pattern has been altered. Also, the visual appearance of the original refinery equipment has been altered, as the height and exterior of the stacks have been changed (Watson 2009f, DPR 523L, p. 2). The original period of construction is 1922–1953, and it appears that due to heavy in-fill and substantial alterations, the BP Carson Refinery no longer resembles its original plan.

Historically, the refinery is located within a portion of the county that was used for petroleum processing and tank storage farms as early as 1922, when oil refinery and petroleum-related activities began in the Dominguez Hill region, one mile north of the proposed BP Watson project. It was Pan American Petroleum which originally established the tank farm that is located within the built-environment APE, a company with substantial holdings in the oil industry that also controlled numerous tank farms outside of the Carson area (Watson 2009f, DPR 523L, p. 4).

Richfield Oil appears to have added the oil refinery to the existing tank farm in 1953, before the incorporation of the City of Carson. Around this time, much of the land was held by large industrial companies such as Shell, Texaco, Mobile Oil, and others, who opposed a cityhood movement because these businesses were afraid that their taxes would increase (Watson 2009f, DPR 523L, p. 4).

The Dominguez Channel

The Dominguez Channel is a man-made stream draining the Dominguez Watershed of 110 square miles, 96% of which is developed. It is approximately 15 miles long and runs via the City of Hawthorne into the Cerritos Channel and into the Inner Harbor of Los Angeles. The portion of the Dominguez Channel examined and recorded is bordered to the south and west by the Southern Pacific Railroad, and to the west it is bordered by the BP Carson Refinery. The recorded part of the Dominguez Channel, which is located about a half-mile east of the proposed BP Watson project site, is an open earthen and concrete-lined flood control channel, approximately 500 feet wide and 2 miles in length. Historically, the area that now is the Los Angeles and Long Beach Harbors consisted of marshes and mudflats, with Dominguez Slough, a large marshy area to the north, resulting from the Los Angeles River entering the marshes and mudflats. In 1917 the channel was dredged and improved by the Los Angeles County Flood Control District. “Originally, the banks were earthen. It has a deep trapezoidal shape and form and features associated with control and erosion structures, such as box and wing wall culverts, gauge stations, pumps, and valves” (Watson 2009f, DPR 523L, p. 1). The portion of the recorded Dominguez Channel is located in an urban industrial setting characterized by an oil refinery and power generation facilities, manufacturing plants, warehouses, and railroad infrastructure. The channel displays vegetation features along its banks and rock ballasts, which also are located on top of the concrete linings. URS describes the property’s condition as fair, with some concrete portions having experienced water ponding, cracking, spalling, chipping, and fretting (Watson 2009f, DPR 523A, p. 2).

Based on a review of historic maps and photographs, it is evident that an alteration of the channel’s original alignment occurred between 1942 and 1946. “Before 1942, the channel crossed the railroad tracks at the intersection of Alameda and Long Beach and Redondo Road (now Sepulveda Boulevard). The channel was then altered to cross Alameda Street a half-mile north of Sepulveda, and travel in a more pronounced west-east direction” (Watson 2009f, DPR 523L, p. 4). In 1956, the next alteration of the channel occurred, changing its shape and form, and by 1965, after an additional widening and the addition of more infrastructure elements, crossings, and gage stations, the Dominguez Channel had changed substantially from its original design and form.

The Southern Pacific Railroad (previously recorded as 36-10330/CA-SBR-10330H)

URS recorded and evaluated a portion of the Southern Pacific Railroad which is located outside of the BP Watson project footprint, within the built-environment project area of analysis. The evaluated segment is located north of Sepulveda Boulevard, east of the BP Carson Refinery, and south of the Dominguez Channel. This portion of the railroad was built between 1869 and 1876. On the 1902 “Downey” U. S. Geological Survey (USGS) map it appears originally as a single track railroad. “Between 1903 and 1930, the area…held multiple tracks used by the Pacific Electric, Southern Pacific, and Santa Fe railroads. Between 1951 and 1964, more tracks were added to the area” (Watson 2009f, DPR 523L, p. 1). These railroads provided transportation from the port areas and Wilmington north to Los Angeles and serviced the adjacent refineries and tank farms.

The resource appears to have five to seven standard gauge tracks running north to south parallel to Alameda Avenue, with typical associated auxiliary equipment such as railroad switches, signals, and storage areas. The tracks sit on small-to-medium rock ballasts. URS stated that most of the materials appear to be recent replacement materials, not from the nineteenth-century construction period.

Summary of Cultural Resources Identified In or Near the Proposed Project Site

Within a one-mile radius of the proposed project site, the CHRIS records search identified 11 cultural resources, consisting of seven archaeological sites and four built-environment resources. Within the same area, no additional cultural resources were identified through other archival research, inquiries to local planning and historical agencies and organizations, consultation with Native Americans, or archaeological field survey. The 11 previously identified cultural resources were not located where the project could have either a direct or indirect impact on any aspect of their integrity, so staff does not need to evaluate their eligibility for the CRHR.

The applicant’s built-environment field survey identified three built-environment resources located where the project could have a direct impact on their integrity of setting and integrity of feeling, so staff must evaluate their CRHR eligibility.

Determining the Historical Significance of Cultural Resources

CEQA requires the Energy Commission, as a lead agency, to evaluate the historical significance of cultural resources by determining whether they meet several sets of specified criteria. Under CEQA, the definition of a historically significant cultural resource is that it is eligible for listing in the CRHR, and such a cultural resource is referred to as a “historical resource, which is a “resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the CRHR”, or “a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting the requirements of section 5024.1 (g) of the Public Resources Code,” or “any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency's determination is supported by substantial evidence in light of the whole record" (Cal. Code Regs., tit. 14, § 15064.5(a)). The term, "historical resource," therefore, indicates a cultural resource that is historically significant and eligible for the CRHR.

Consequently, under the CEQA Guidelines, to be historically significant, a cultural resource must meet the criteria for listing in the CRHR. These criteria are essentially the same as the eligibility criteria for the NRHP. In addition to being at least 50 years old,[3] a resource must meet at least one (and may meet more than one) of the following four criteria (Pub. Resources Code, § 5024.1):

- Criterion 1, is associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion 2, is associated with the lives of persons significant in our past;
- Criterion 3, embodies the distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values; or
- Criterion 4, has yielded, or may be likely to yield, information important to history or prehistory.

Historical resources must also possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance (Cal. Code Regs., tit. 14, § 4852(c)).

Additionally, cultural resources listed in or formally determined eligible for the National Register of Historical Places (NRHP) and California Registered Historical Landmarks numbered No. 770 and up are automatically listed in the CRHR and are therefore also historical resources (Pub. Resources Code, § 5024.1(d)). Even if a cultural resource is not listed or determined to be eligible for listing in the CRHR, CEQA allows a lead agency to make a determination as to whether it is a historical resource (Pub. Resources Code, § 21084.1).

The assessment of potentially significant impacts to historical resources and the mitigation that may be required of a proposed project to ameliorate any such impacts depend on CRHR-eligibility evaluations.

CRHR Evaluations

Under CEQA, only CRHR-eligible cultural resources that the proposed project could potentially impact need be considered in staff's recommendations for mitigation measures for project impacts. Consequently staff seeks CRHR eligibility recommendations for those cultural resources subject to possible project impacts. The existing documentation for previously known cultural resources may include CRHR eligibility recommendations, and the applicant's cultural resources specialists often make CRHR eligibility recommendations for newly identified cultural resources they

[3] The Office of Historic Preservation's Instructions for Recording Historical Resources (1995) endorses recording and evaluating resources over 45 years of age to accommodate a potential five-year lag in the planning process.

discover and record in their project-related surveys. Staff considers these prior CRHR eligibility evaluations and may accept them or conclude that additional information is needed before making its own recommendations.

When the available information on known or newly identified resources that could be impacted by the proposed project is not sufficient for staff to make a recommendation on CRHR eligibility, staff may ask an applicant to conduct additional research to gather the information needed to make such a recommendation, or staff may gather the additional information. For an archaeological resource, the additional research usually entails some degree of field excavation, called a "Phase II" investigation. For an ethnographic resource, the additional research may be an ethnographic study. For built-environment resources, the additional research would probably be archival. The object of this additional research is to obtain sufficient information to enable staff to validate or make a recommendation of CRHR eligibility for each cultural resource that the proposed project could impact.

Evaluated Cultural Resources

No archaeological resources were identified on or near the proposed project site or laydown and parking area. The three built-environment resources that URS identified within the built-environment project area of analysis included the BP Carson Refinery (constructed 1922–1925), a portion of the Dominguez Channel (constructed in 1917), and a segment of the Southern Pacific Railroad (constructed 1869–1876).

The BP Carson Refinery was previously unevaluated. URS concluded that the refinery does not qualify for the CRHR and therefore is not a historical resource for the purposes of CEQA. URS states that Richfield Oil's establishment and operation of its refinery in Carson is not associated with events that made a significant contribution to the history of industrial oil production, nor is the company's opposition to the incorporation of the City of Carson associated with a significant contribution to that city's history (CRHR Criterion 1). No persons significant in our past have been associated with the refinery, so it would not qualify under CRHR Criterion 2. The refinery has seen substantial infill and alteration which has resulted in changes to the visual appearance and to the original plan, which also disqualify it (CRHR Criterion 3). The refinery represents common, utilitarian industrial design and construction that can be found in similar industrial sites of the Carson area, so the refinery cannot yield information important in history (Criterion 4). Energy Commission staff agrees with this analysis.

The Dominguez Channel also was previously unevaluated. URS concluded that the portion of the channel which is located within the built-environment project area of analysis for the BP Watson project, is not eligible for the CRHR because it does not have an association with a significant event, pattern of events, or person (Criteria 1 and 2). Also, being an example of the most common type of water conveyance system in California, an open canal, it does not embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values (Criterion 3). Finally, again, because its design and construction are common, it does not have the potential to yield information important to history (Criterion 4). Staff agrees with their conclusion that the recorded portion of the Dominguez Channel is not eligible for the CRHR. Additionally, URS points out that the resource has been heavily altered from its original 1917 design (Watson 2009f, DPR 523A, p. 4).

The URS-recorded segment of the Southern Pacific Railroad near the project site is an element of a larger resource, the Union Pacific Railroad (originally the Southern Pacific Railroad). The Union Pacific Railroad was recorded and evaluated in 1999 by Jones & Stokes, who found it to be eligible for the NRHP under Criteria A and B (Watson 2009f, DPR 523A, P36-010330). URS evaluated the segment of the Southern Pacific railroad located within the project area of analysis and concluded that this segment did not appear to be a contributing element to the larger Southern Pacific railroad and also that it was not individually eligible for the CRHR because the recorded segment is not a distinctive railroad element and does not convey the significance of the entire Southern Pacific Railroad (Criterion 1); it is not associated with the lives of historical figures (Criterion 2); it does not embody the work of a master or embody distinctive style characteristics, as it is a modest example of a siding area lacking any distinguishing features, materials, and arrangements (Criterion 3); and it does not appear to be able to yield any information important to history as the original materials no longer appear to be present (Watson 2009f DPR 523L, p. 1). Staff agrees with that conclusion.

All CRHR-Eligible Resources Subject To Potential Project Impacts

Staff has concluded that there are no historical resources in the BP Watson project areas. Staff has not found the three newly recorded resources within the built-environment area of analysis to be historical resources for purposes of CEQA, as they are not eligible for the CRHR, and there are no archaeological resources in the BP Watson project's archaeological area of analysis.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

Method and Threshold for Determining Significance of Impacts to Historical Resources

Under CEQA, "a project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment" (Pub. Resources Code, § 21084.1). Thus, staff analyzes whether a proposed project would cause a substantial adverse change in the significance, that is, the CRHR eligibility, of all historical resources identified in the Cultural Resources Inventory as CRHR eligible. The degree of significance of an impact depends on:

- the cultural resource impacted;
- the nature of the resource's historical significance;
- how the resource's historical significance is manifested physically and perceptually;
- appraisals of those aspects of the resource's integrity that figure importantly in the manifestation of the resource's historical significance; and
- how much the impact will change those integrity appraisals.

DIRECT AND INDIRECT IMPACTS

In the abstract, direct impacts to cultural resources are those associated with project development, construction, and co-existence. Construction usually entails surface and subsurface disturbance of the ground, and direct impacts to archaeological resources may result from the immediate disturbance of the deposits, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, excavation, or demolition of overlying structures. Construction can have direct impacts on historic built-environment resources when those structures must be removed to make way for new structures or when the vibrations of construction impair the stability of historic structures nearby. New structures can have direct impacts on historic structures when the new structures are stylistically incompatible with their neighbors and the setting, and when the new structures produce something harmful to the materials or structural integrity of the historic structures, such as emissions or vibrations.

Generally speaking, indirect impacts to archaeological resources are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource components due to improved accessibility. Similarly, historic structures can suffer indirect impacts when project construction causes obsolescence and demolition or creates improved accessibility, making vandalism or greater weather exposure possible.

Ground disturbance accompanying construction at a proposed plant site, along proposed linear facilities, and at a proposed laydown area has the potential to directly impact archaeological resources, unidentified at this time. The potential direct, physical impacts of the proposed construction on unknown archaeological resources are commensurate with the extent of ground disturbance entailed in the particular mode of construction. This varies with each component of the proposed project. Placing the proposed plant into this particular setting could have a direct impact on the integrity of association, setting, and feeling of nearby standing historic structures.

Construction Impacts and Mitigation

Identification and Assessment of Direct Impacts and Recommended Mitigation

The applicant concluded that the project is not anticipated to affect significant cultural resources but is recommending archaeological construction monitoring and Native American monitoring and testing or data recovery in the event that an archaeological site is identified during construction.

The applicant has stated that human remains are not anticipated within the project site "given the absence of a prehistoric deposit" but recommends the following provisions to be followed in case human remains are encountered: immediate halting of construction activities within vicinity of discovery; immediate contacting of County Coroner and project applicant by project supervisor; contacting of the NAHC if the remains are Native American with the NAHC determining the Most Likely Descendant (MLD) to notify this identified MLD with the request to inspect the burial and make recommendation for treatment and removal (Watson 2009f, p. 7-3).

Staff has concluded that the proposed construction and construction-related activities of the BP Watson project, the expansion of the existing facility by the addition of a fifth combustion turbine generator, would not have any direct impact on known cultural resources if the construction would be implemented as proposed. Because buried archaeological deposits are unlikely in the fill underlying the project site and because no ground disturbance is anticipated at the laydown and parking area, staff is not recommending full-time monitoring of construction activities in those locations. Fill material can sometimes contain artifacts, but the applicant described the fill at the project site as “engineered” fill, and fill of that nature has been processed for homogeneity, so no artifacts would be expected in engineered fill.

Staff also has concluded that finding any human remains is not anticipated but recommends in the case of any accidental discovery or recognition of any human remains to follow the provisions of CEQA (Cal. Code Regs., tit. 14, § 15064.5, subd. (e)).

CEQA advises a lead agency to make provisions for archaeological resources unexpectedly encountered during construction, and a project owner may be required to train workers to recognize cultural resources, fund mitigation, and delay construction in the area of the find (Pub. Resources Code, § 21083.2; Cal. Code Regs., tit. 14, §§ 15064.5(f) and 15126.4(b)).

Although staff identified no known CRHR-eligible cultural resources that the construction of the proposed BP Watson project would impact, and staff also considers it unlikely that previously unidentified buried archaeological deposits would be encountered during construction-related excavations, due to the extensive presence of fill on the project site, still staff considers it prudent, as does the applicant, to recommend archaeological monitoring that would be initiated if any buried deposits should be discovered. Consequently, staff recommends that the Commission adopt the following cultural resources Conditions of Certification **CUL-1** through **CUL-7**. These measures are intended to facilitate the identification and assessment of previously unidentified archaeological resources encountered during construction and to mitigate any significant impacts from the project on any newly found resources assessed as significant. These conditions also address concerns expressed by Native Americans

To accomplish this, cultural resources Conditions of Certification **CUL-1** through **CUL-7** provide for the hiring of a Cultural Resources Specialist (CRS) to provide cultural resources awareness training for construction workers and to write a Cultural Resources Monitoring and Mitigation Plan (CRMMP) as preparation for monitoring, if it should be required by the CPM. If workers identify buried archaeological deposits that the CPM determines are CRHR eligible, the conditions also provide for archaeological and possibly Native American monitoring of ground-disturbing activities in areas where additional resources could be found; for the recovery of data from discovered CRHR-eligible archaeological deposits; for the writing of a technical archaeological report on all archaeological activities and findings, to be submitted to the CPM and to interested Native Americans and others; and for the curation of recovered artifacts and other data. When properly implemented and enforced, staff believes that these conditions of certification would reduce to less than significant any impacts to previously unknown CRHR-eligible cultural resources encountered during construction.

Staff also recommends the adoption of Condition of Certification **CUL-8** to comply with the City of Carson’s historic preservation standards. By complying with this condition of certification the BP project would be in conformance with all applicable LORS.

Identification and Assessment of Indirect Impacts and Recommended Mitigation

The proposed project would result in architectural in-fill consisting of an additional industrial unit with a proposed turbine tower not taller than 100 feet. As the surroundings of the proposed BP Watson project are similar to the proposed industrial addition, the project would not cause a significant change in the setting of any built-environment resources in the project's vicinity.

Moreover, the in-fill construction that has been going on since the 1950s has disrupted the original skyline. "Numerous overbearing monumental-sized stacks now dot the sky-line (as opposed to the approximately eight originally). The majority of the new stacks are guyed, free-standing, or feature lattice support structures, and are generally much larger than the original stacks" (Watson 2009f, DPR 523L, p. 2). Therefore, no indirect impact of a visual nature would add to the already compromised existing view.

Staff has thus concluded that the project would not have any significant indirect impacts and recommends that no mitigation measures for indirect impacts would be required. Staff proposes no cultural resources conditions of certification addressing indirect impacts.

Operation Impacts and Mitigation

Because any ground disturbance that might occur due to maintenance or repairs during operation would be in the fill known to underlie the proposed project area, staff has concluded that the operation of the project would have no adverse impacts on cultural resources. Therefore no mitigation measures would be required, and staff proposed no conditions of certification addressing operation impacts.

Cumulative Impacts and Mitigation

A cumulative impact refers to a proposed project's incremental effects considered over time and together with those of other, nearby, past, present, and reasonably foreseeable future projects whose impacts may compound or increase the incremental effect of the proposed project (Pub. Resources Code sec. 21083; Cal. Code Regs., tit. 14, secs. 15064(h), 15065(a)(3), 15130, and 15355).

The applicant's cultural resources consultant has concluded that the project would not have a significant cumulative effect on historical resources (Watson 2009f p. 5.7-35). Staff concurs with this conclusion because staff's analysis has also indicated that, as no unique cultural resources or historical resources of an archaeological nature were identified in the project areas of analysis, the project would have no significant impacts on known CRHR-eligible cultural resources. Therefore, the project would not contribute to an incremental impact on cultural resources and thus would not have a cumulatively considerable impact on cultural resources. Hence, staff has recommended no cultural resources mitigation measures for cumulative impacts.

COMPLIANCE WITH LORS

If the BP Watson project is built as proposed there would be no impact on historical and cultural resources. Therefore, the project would be in compliance with applicable state laws, ordinances, regulations, and standards as listed in **Cultural Resources Table 1**.

The City of Carson does not have a local historic preservation ordinance. But the city's general plan policies encourage project proponents to provide the results of such historic preservation activities as historic resource surveys to the City's Planning and Environmental Services Division. For the BP Watson project, resource surveys have been completed. To ensure that the BP Watson project is consistent with the goals of the City of Carson's General Plan Implementation Measure P-IM-9.3, staff has included a condition of certification requiring the applicant to provide their cultural resources survey reports to the City's Planning and Environmental Services Division. With the fulfillment of this condition, the BP Watson project would be in conformance with the goals of the City of Carson's General Plan.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None Received.

CONCLUSIONS AND RECOMMENDATIONS

Based on the present cultural resources analysis, staff concludes that the proposed project would have no direct or indirect significant impacts to any historical resources. The three newly recorded resources within the built-environment project area of analysis have not been found to be historical resources for purposes of CEQA, as they have not been found to be eligible to the California Register of Historical Resources. There are no archaeological or cultural resources in the project's area of analysis. The construction of the fifth cogeneration unit and its operation would not result in an indirect impact to any historical or cultural resources.

As part of the procedures and objectives required by CEQA pursuant to Pub. Resources Code sec. 21082, Cal. Code Regs., tit. 14, secs. 15064.5 (f) staff recommends the adoption of Conditions of Certifications **CUL-1** through **CUL-7** for the accidental discovery of historical or unique archaeological resources during construction, and Condition of Certification **CUL-8** to comply with the City of Carson's historic preservation standards. By adopting these conditions of certification any unanticipated discovery of a historical or unique archaeological resource could be mitigated below a level of significance, and the BP Watson project would be in conformance with all applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of ground disturbance (includes "preconstruction site mobilization"; "construction ground disturbance"; and "construction grading, boring, and trenching" as defined in the General Conditions for this project), the project owner shall obtain the services of a Cultural Resources Specialist (CRS), and one or more alternate CRS(s), if alternates are needed. The CRS shall manage all monitoring, mitigation, curation and reporting activities required in accordance with the Conditions of Certification (Conditions). The CRS may elect to obtain the services of Cultural Resource Monitors (CRMs) and other technical specialists, if needed, to assist in monitoring, mitigation, and curation activities. The project owner shall ensure that the CRS makes recommendations regarding the eligibility for listing in the California Register of Historical Resources (CRHR) of any cultural resources that are newly discovered or that may be affected in an unanticipated manner. No ground disturbance shall occur prior to CPM approval of the CRS, unless such activities are specifically approved by the CPM. Approval of a CRS may be denied or revoked for non-compliance on this or other projects. After all ground disturbance is completed and the CRS has fulfilled all responsibilities specified in these cultural resources conditions, the project owner may discharge the CRS, if the CPM approves. With the discharge of the CRS, these cultural resources conditions no longer apply to the activities of this power plant.

CULTURAL RESOURCES SPECIALIST

The resumes for the CRS and alternate(s) shall include information demonstrating to the satisfaction of the CPM that their training and backgrounds conform to the U.S. Secretary of Interior's Professional Qualifications Standards, as published in the Code of Federal Regulations, 36 CFR Part 61. In addition, the CRS shall have the following qualifications:

1. qualifications appropriate to the needs of the project, including a background in anthropology, archaeology, history, architectural history, or a related field;

2. at least three years of archaeological or historic, as appropriate(per nature of predominate cultural resources on the project site), resource mitigation and field experience in California; and

3. at least one year of experience in a decision-making capacity on cultural resources projects in California and the appropriate training and experience to knowledgably make recommendations regarding the significance of cultural resources.

The resumes of the CRS and alternate CRS shall include the names and telephone numbers of contacts familiar with the work of the CRS/alternate CRS on referenced projects and demonstrate to the satisfaction of the CPM that the CRS/alternate CRS has the appropriate training and experience to implement effectively the Conditions of Certification.

CULTURAL RESOURCES MONITORS

CRMs shall have the following qualifications:

1. a BS or BA degree in anthropology, archaeology, historical archaeology or a related field and one year experience monitoring in California; or

2. an AS or AA degree in anthropology, archaeology, historical archaeology or a related field, and four years experience monitoring in California; or

3. enrollment in upper division classes pursuing a degree in the fields of anthropology, archaeology, historical archaeology or a related field, and two years of monitoring experience in California.

CULTURAL RESOURCES TECHNICAL SPECIALISTS

The resume(s) of any additional technical specialists, e.g., historical archaeologist, historian, architectural historian, and/or physical anthropologist, shall be submitted to the CPM for approval.

<u>Verification:</u> At least 45 days prior to the start of ground disturbance, the project owner shall submit the resume for the CRS, and alternate(s) if desired, to the CPM for review and approval.

1. At least 10 days prior to a termination or release of the CRS, or within 10 days after the resignation of a CRS, the project owner shall submit the resume of the proposed new CRS to the CPM for review and approval. At the same time, the project owner shall also provide to the proposed new CRS the AFC and all cultural resources documents, field notes, photographs, and other cultural resources materials generated by the project. If there is no alternate CRS in place to conduct the duties of the CRS, a designated, qualified monitor may serve in place of a CRS so that project-related ground disturbance may continue up to a maximum of 3 days without a CRS. If cultural resources are discovered then ground disturbance will remain halted until there is a CRS or alternate CRS to make a recommendation regarding significance.

2. As soon as the CPM requires monitoring, the CRS, if CRMS are to be used, shall provide a letter naming anticipated CRMs for the project and stating that the identified CRMs meet the minimum qualifications for cultural resources monitoring required by this Condition.

3. As soon as the CRS determines that additional CRMs will be needed, the CRS shall provide letters to the CPM identifying the new CRMs and attesting to their qualifications.

4. As soon as the CRS determines that any technical specialists will be needed, the resume(s) of the specialists shall be provided to the CPM for review and approval.

5. At least 10 days prior to the start of ground disturbance, the project owner shall confirm in writing to the CPM that the approved CRS will be available for onsite work and is prepared to implement the cultural resources Conditions.

CUL-2 Prior to the start of ground disturbance, if the CRS has not previously worked on the project, the project owner shall provide the CRS with copies of the AFC, data responses, confidential cultural resources reports for the project, and the Energy Commission Final Staff Assessment. The project owner shall also provide the CRS and the CPM with maps and drawings showing the footprints of the power plant, all linear facility routes, all access roads, and all laydown areas. Maps shall include the appropriate USGS quadrangles and a map at an appropriate scale (e.g., 1:2000 or 1” = 200’) for plotting cultural features or materials. If the CRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the CRS and CPM. The CPM shall review map submittals and, in consultation with the CRS, approve those that are appropriate for use in cultural resources planning activities. No ground disturbance shall occur prior to CPM approval of maps and drawings, unless such activities are specifically approved by the CPM.

If construction of the project would proceed in phases, maps and drawings not previously provided shall be submitted prior to the start of each phase. Written notification identifying the proposed schedule of each project phase shall be provided to the CRS and CPM.

Weekly, until construction-related ground disturbance is completed, the project construction manager shall provide to the CRS and CPM a schedule of project activities for the following week, including the identification of area(s) where construction-related ground disturbance will occur during that week.

The project owner shall notify the CRS and CPM of any changes to the scheduling of the construction phases.

Verification: At least 40 days prior to the start of ground disturbance, the project owner shall provide the AFC, data responses, confidential cultural resource documents, and the Energy Commission Final Staff Assessment to the CRS, if needed, and the subject maps and drawings to the CRS and CPM. The CPM will review submittals in consultation with the CRS and approve maps and drawings suitable for cultural resources planning activities.

1. At least 15 days prior to the start of ground disturbance, if there are changes to any project-related footprint, the project owner shall provide revised maps and drawings for the changes to the CRS and CPM.

2. At least 15 days prior to the start of each phase of a phased project, the project owner shall submit the appropriate maps and drawings, if not previously provided, to the CRS and CPM.

3. Weekly, during ground disturbance, a current schedule of anticipated project activity shall be provided to the CRS and CPM by letter, e-mail, or fax.

4. Within five days of changing the scheduling of phases of a phased project, the project owner shall provide written notice of the changes to the CRS and CPM.

CUL-3 Prior to the start of ground disturbance, the project owner shall submit the Cultural Resources Monitoring and Mitigation Plan (CRMMP), as prepared by or under the direction of the CRS, to the CPM for review and approval. The CRMMP shall follow the content and organization of the draft model CRMMP, provided by the CPM, and the authors' name(s) shall appear on the title page of the CRMMP. The CRMMP shall identify general and specific measures to minimize potential impacts to sensitive cultural resources. Implementation of the CRMMP shall be the responsibility of the CRS and the project owner. Copies of the CRMMP shall reside with the CRS, alternate CRS, each CRM, and the project owner's on-site construction manager. No ground disturbance shall occur prior to CPM approval of the CRMMP, unless such activities are specifically approved by the CPM.

The CRMMP shall include, but not be limited to, the following elements and measures:

1. the following statement included in the Introduction: "Any discussion, summary, or paraphrasing of the Conditions of Certification in this CRMMP is intended as general guidance and as an aid to the user in understanding the Conditions and their implementation. The conditions, as written in the Commission Decision, shall supersede any summarization, description, or interpretation of the conditions in the CRMMP. The Cultural Resources Conditions of Certification from the Commission Decision are contained in Appendix A."

2. a proposed general research design that includes a discussion of archaeological research questions and testable hypotheses specifically applicable to the project area, and a discussion of artifact collection, retention/disposal, and curation policies as related to the research questions formulated in the research design. The research design will specify that the preferred treatment strategy for any buried archaeological deposits is avoidance. A specific mitigation plan shall be prepared for any unavoidable impacts to any CRHR-eligible (as determined by the CPM) resources. A prescriptive treatment plan may be included in the CRMMP for limited data types.

3. specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the ground-disturbance and post-ground–disturbance analysis phases of the project.

4. identification of the person(s) expected to perform each of the tasks, their responsibilities, and the reporting relationships between project construction management and the mitigation and monitoring team.

5. a description of the manner in which Native American observers or monitors, if needed, will be included, the procedures to be used to select them, and their role and responsibilities.

6. Specification of the manner in which human remains and grave associated artifacts, if discovered during construction, will be treated according to the applicable laws and regulations, and in consultation with the wishes of the consulting Native Americans [Refer to Comment 4.3.1].

7. a description of all impact-avoidance measures (such as flagging or fencing) to prohibit or otherwise restrict access to sensitive resource areas

identified during construction ground disturbance. The description shall address how these measures would be implemented once sensitive areas are identified and how long they would be needed to protect the resources from project-related effects.

8. a statement that all encountered cultural resources over 50 years old shall be recorded on a DPR form 523 and mapped and photographed. In addition, all archaeological materials retained as a result of the archaeological investigations (survey, monitoring, testing, data recovery) shall be curated in accordance with the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, into a retrievable storage collection in a public repository or museum.

9. a statement that the project owner will pay all curation fees for artifacts recovered and for related documentation produced during cultural resources investigations conducted for the project. The project owner shall identify three possible curation facilities that could accept cultural resources materials resulting from project activities.

10. a statement that the CRS has access to equipment and supplies necessary for site mapping, photography, and recovery of any cultural resource materials that are encountered during ground disturbance and cannot be treated prescriptively.

11. a description of the contents and format of the final Cultural Resource Report (CRR), which shall be prepared according to ARMR guidelines.

<u>Verification:</u> Upon approval of the CRS proposed by the project owner, the CPM will provide to the CRS an electronic copy of the draft model CRMMP.

1. At least 30 days prior to the start of ground disturbance, the project owner shall submit the CRMMP to the CPM for review and approval.

2. At least 30 days prior to the start of ground disturbance, a letter shall be provided to the CPM indicating that the project owner agrees to pay curation fees for any materials collected as a result of the archaeological investigations (survey, monitoring, testing, data recovery).

CUL-4 The project owner shall submit the Cultural Resources Report (CRR), if required by the CPM, to the CPM for approval. The CRR shall be written by or under the direction of the CRS and shall be provided in the ARMR format. The CRR shall report on all field activities including dates, times and locations, findings, samplings, and analyses. All survey reports, Department of Parks and Recreation (DPR) 523 forms, data recovery reports, and any additional research reports not previously submitted to the California Historical Resource Information System (CHRIS) and the State Historic Preservation Officer (SHPO) shall be included as appendices to the CRR.

If the project owner requests a suspension of ground disturbance and/or construction activities, then a draft CRR that covers all cultural resources activities associated with the project shall be prepared by the CRS and submitted to the CPM for review and approval on the same day as the suspension/extension request. The draft CRR shall be retained at the project site in a secure facility until ground disturbance and/or construction resumes or the project is withdrawn. If the project is withdrawn, then a final CRR shall be submitted to the CPM for review and approval at the same time as the withdrawal request.

Verification: Within 90 days after completion of ground disturbance (including landscaping), the project owner shall submit the CRR to the CPM for review and approval. If any reports have previously been sent to the CHRIS, then receipt letters from the CHRIS or other verification of receipt shall be included in an appendix.

1. Within 90 days after completion of ground disturbance (including landscaping), the project owner shall provide to the CPM a copy of an agreement with, or other written commitment from, a curation facility that meets the standards stated in the California State Historical Resources Commission's *Guidelines for the Curation of Archaeological Collections*, to accept cultural materials, if any, from this project. Any agreements concerning curation will be retained and available for audit for the life of the project.

2. Within 10 days after CPM approval, the project owner shall provide documentation to the CPM confirming that copies of the CRR have been provided to the SHPO, the CHRIS, the curating institution, if archaeological materials were collected, and to the Tribal Chairpersons of any Native American groups requesting copies of project-related reports.

3. Within 30 days after requesting a suspension of ground disturbance and/or construction activities, the project owner shall submit a draft CRR to the CPM for review and approval.

CUL-5 Prior to and for the duration of ground disturbance, the project owner shall provide Worker Environmental Awareness Program (WEAP) training to all new workers within their first week of employment. The training shall be prepared and conducted by the CRS and may be presented in the form of a video. The CRS shall be available (by telephone or in person) to answer questions posed by employees. The training may be discontinued when ground disturbance is completed or suspended, but must be resumed when ground disturbance, such as landscaping, resumes. The training shall include:

1. a discussion of applicable laws and penalties under the law;

2. samples or visuals of artifacts that might be found in the project vicinity;

3. a discussion of what such artifacts may look like when partially buried, or wholly buried and then freshly exposed;

4. a discussion of what prehistoric and historical archaeological deposits look like at the surface and when exposed during construction, and the range of variation in the appearance of such deposits, with particular emphasis given to distinguishing primary deposits from the general dispersal of artifacts seen in fill;

5. instruction that the CRS, alternate CRS, and CRMs, if any, have the authority to halt project-related ground disturbance in the area of a discovery to an extent sufficient to ensure that the resource is protected from further impacts, as determined by the CRS;

6. instruction that employees are to halt work on their own in the vicinity of a potential cultural resources discovery and shall contact their supervisor and the CRS or CRM, and that redirection of work would be determined by the construction supervisor and the CRS;

7. an informational brochure that identifies reporting procedures in the event of a discovery;

8. an acknowledgement form signed by each worker indicating that they have received the training; and

9. a sticker that shall be placed on hard hats indicating that environmental training has been completed.

No ground disturbance shall occur prior to implementation of the WEAP program, unless such activities are specifically approved by the CPM.

Verification: At least 30 days prior to the beginning of pre-construction site mobilization, the CRS shall provide the training program draft text and graphics and the informational brochure to the CPM for review and approval.

1. At least 15 days prior to the beginning of ground disturbance, the CPM will provide to the project owner a WEAP Training Acknowledgement form for each WEAP-trained worker to sign..

2. Monthly, until ground disturbance is completed, the project owner shall provide in the Monthly Compliance Report (MCR) the WEAP Training Acknowledgement forms of workers who have completed the training in the prior month and a running total of all persons who have completed training to date.

CUL-6 At the direction of the CPM, the project owner shall ensure that the CRS, alternate CRS, or CRMs monitor full time all ground disturbance in the area where a CRHR-eligible (as determined by the CPM) cultural resources discovery has been made. The level, duration, and spatial extent of monitoring shall be determined by the CPM. In the event that the CRS believes that a current level of monitoring is not appropriate, a letter or e-mail detailing the justification for changing the level of monitoring shall be provided to the CPM for review and approval prior to any change in the level of monitoring.

Full-time archaeological monitoring for this project shall be the archaeological monitoring of the earth-removing activities in the areas specified in the previous paragraph, for as long as the CPM requires. Where excavation equipment is actively removing dirt and hauling the excavated material farther than fifty feet from the location of active excavation, full-time archaeological monitoring shall require at least two monitors per excavation area. In this circumstance, one monitor shall observe the location of active excavation and a second monitor shall inspect the dumped material. For excavation areas where the excavated material is dumped no farther than fifty feet from the location of active excavation, one monitor shall both observe the location of active excavation and inspect the dumped material.

A Native American monitor shall be obtained to monitor ground disturbance in areas where Native American artifacts may be discovered. Contact lists of interested Native Americans and guidelines for monitoring shall be obtained from the Native American Heritage Commission. Preference in selecting a monitor shall be given to Native Americans with traditional ties to the area that shall be monitored. If efforts to obtain the services of a qualified Native American monitor are unsuccessful, the project owner shall immediately inform the CPM. The CPM will either identify potential monitors or will allow ground disturbance to proceed without a Native American monitor.
The research design in the CRMMP shall govern the collection, treatment, retention/disposal, and curation of any archaeological materials encountered during archaeological monitoring.

If monitoring should be needed, as determined by the CPM, CRMs shall keep a daily log of any monitoring and other cultural resources activities and any instances of non-compliance with the Conditions and/or applicable LORS on forms provided by the CPM. Copies of the daily monitoring logs shall be provided by the CRS to the CPM, if requested by the CPM. From these logs, the CRS shall compile a monthly monitoring summary report to be included in the MCR. If there are no monitoring activities, the summary report shall specify why monitoring has been suspended.

The CRS or alternate CRS shall report daily to the CPM on the status of the project's cultural resources-related activities, unless reducing or ending daily reporting is requested by the CRS and approved by the CPM.

The CRS, at his or her discretion, or at the request of the CPM, may informally discuss cultural resource monitoring and mitigation activities with Energy Commission technical staff.

Cultural resources monitoring activities are the responsibility of the CRS. Any interference with monitoring activities, removal of a monitor from duties assigned by the CRS, or direction to a monitor to relocate monitoring activities by anyone other than the CRS shall be considered non-compliance with these Conditions.

Upon becoming aware of any incidents of non-compliance with the Conditions and/or applicable LORS, the CRS and/or the project owner shall notify the CPM by telephone or e-mail within 24 hours. The CRS shall also recommend corrective action to resolve the problem or achieve compliance with the Conditions. When the issue is resolved, the CRS shall write a report describing the issue, the resolution of the issue, and the effectiveness of the resolution measures. This report shall be provided in the next MCR for the review of the CPM.

Verification: At least 30 days prior to the start of ground disturbance, the CPM will provide to the CRS an electronic copy of a form to be used as a daily monitoring log.

1. Monthly, while monitoring is on-going, the project owner shall include in each MCR a copy of the monthly summary report of cultural resources-related monitoring prepared by the CRS and shall attach any new DPR 523A forms completed for finds treated prescriptively, as specified in the CRMMP.

2. At least 24 hours prior to implementing a proposed change in monitoring level, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for changing the monitoring level.

3. Daily, as long as no cultural resources are found, the CRS shall provide a statement that "no cultural resources over 50 years of age were discovered" to the CPM as an e-mail or in some other form of communication acceptable to the CPM.

4. At least 24 hours prior to reducing or ending daily reporting, the project owner shall submit to the CPM, for review and approval, a letter or e-mail (or some other form of communication acceptable to the CPM) detailing the CRS's justification for reducing or ending daily reporting.

5. No later than 30 days following the discovery of any Native American cultural materials, the project owner shall submit to the CPM copies of the information transmittal letters sent to the Chairpersons of the Native American tribes or groups who requested the information. Additionally, the project owner shall submit to the CPM copies of letters of transmittal for all subsequent responses to Native American requests for notification, consultation, and reports and records.

6. Within 15 days of receiving them, the project owner shall submit to the CPM copies of any comments or information provided by Native Americans in response to the project owner's transmittals of information.

CUL-7 The project owner shall grant authority to halt project-related ground disturbance to the CRS, alternate CRS, and the CRMs in the event of a discovery. Redirection of ground disturbance shall be accomplished under the direction of the construction supervisor in consultation with the CRS.

In the event cultural resources over 50 years of age (or, if younger, determined exceptionally significant by the CPM) are found, or impacts to such resources can be anticipated, ground disturbance shall be halted or redirected in the immediate vicinity of the discovery sufficient to ensure that the resource is protected from further impacts. Monitoring and daily reporting as provided in other conditions shall continue during all ground-disturbing activities elsewhere on the project site. The halting or redirection of ground disturbance shall remain in effect until the CRS has visited the discovery, and all of the following have occurred:

1. The CRS has notified the project owner, and the CPM has been notified within 24 hours of the discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning, including a description of the discovery (or changes in character or attributes), the action taken (i.e. work stoppage or redirection), a recommendation of CRHR eligibility, and recommendations for mitigation of any cultural resources discoveries, whether or not a determination of CRHR eligibility has been made.

2. If the discovery would be of interest to Native Americans, the CRS has notified all Native American groups that expressed a desire to be notified in the event of such a discovery.

3. The CRS has completed field notes, measurements, and photography for a DPR 523 primary form. Unless the find can be treated prescriptively, as specified in the CRMMP, the “Description” entry of the DPR 523 form shall include a recommendation on the CRHR eligibility of the discovery. The project owner shall submit completed forms to the CPM.

4. The CRS, the project owner, and the CPM have conferred, and the CPM has concurred with the recommended eligibility of the discovery and approved the CRS’s proposed data recovery, if any, including the curation of the artifacts, or other appropriate mitigation; and any necessary data recovery and mitigation have been completed.

Ground disturbance may resume only with the approval of the CPM.

Verification: At least 30 days prior to the start of ground disturbance, the project owner shall provide the CPM and CRS with a letter confirming that the CRS, alternate CRS, and CRMs have the authority to halt project-related ground disturbance in the vicinity of a cultural resources discovery, and that the project owner shall ensure that the CRS notifies the CPM within 24 hours of a discovery, or by Monday morning if the cultural resources discovery occurs between 8:00 AM on Friday and 8:00 AM on Sunday morning.

1. Within 48 hours of the discovery of an archaeological or ethnographic resource, the project owner shall ensure that the CRS notifies all Native American groups that expressed a desire to be notified in the event of such a discovery.

2. Unless the discovery can be treated prescriptively, as specified in the CRMMP, completed DPR 523 forms for resources newly discovered during ground

disturbance shall be submitted to the CPM for review and approval no later than 24 hours following the notification of the CPM, or 48 hours following the completion of data recordation/recovery, whichever the CRS decides is more appropriate for the subject cultural resource.

CUL-8 The project owner shall submit copies of the archaeological and built-environment survey reports, and all associated forms produced for the BP Watson Cogeneration Steam and Electric Reliability Project's Energy Commission Application for Certification, to the City of Carson's Planning and Environmental Services Division, in compliance with the City's General Plan Implementation Measure P-IM-9.3.

<u>Verification:</u> At least 30 days prior to the start of ground disturbance, the project owner shall provide documentation to the CPM confirming that copies of the archaeological and built-environment survey reports, and all associated forms produced for the BP Watson Cogeneration Steam and Electric Reliability Project's Energy Commission Application for Certification, have been provided to the City of Carson's Planning and Environmental Services Division. Documentation may consist of a letter of receipt from the Planning and Environmental Services Division.

CULTURAL RESOURCES ACRONYM GLOSSARY

WATSON COGNENERATION STEAM AND ELECTRIC RELIABILITY PROJECT

AFC	Application for Certification
Area of Analysis	The area within and around a project site that staff considers when compiling an inventory of cultural resources and when assessing potential impacts
AD	After the Birth of Christ
ARMR	Archaeological Resource Management Report
BC	Before the Birth of Christ
BP Watson	Watson Cogeneration Steam and Electric Reliability Project
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
Conditions	Conditions of Certification
CRHR	California Register of Historical Resources
CRM	Cultural Resources Monitor
CRMMP	Cultural Resources Monitoring and Mitigation Plan
CRR	Cultural Resources Report
CRS	Cultural Resources Specialist
DPR 523	Department of Parks and Recreation cultural resource inventory form
FSA	Final Staff Assessment
LORS	laws, ordinances, regulations, and standards
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places

OHP	Office of Historic Preservation
PSA	Preliminary Staff Assessment
Project Site	The bounded area identified by the applicant as the area within which they propose to build the project
SHPO	State Historic Preservation Officer
Staff	Energy Commission cultural resources technical staff
Watson	Watson Cogeneration Company

REFERENCES

The "(tn: 00000)" in a reference below indicates the transaction number under which the item is catalogued in the Energy Commission's Docket Unit. The transaction number allows for quicker location and retrieval of individual files.

Bean and Smith 1978—Bean, L. J. and C. R. Smith, "Gabrielino," in *Handbook of North American Indians*, Vol. 8, pp. 538–549. Robert F. Heizer, ed. Washington, D. C.: Smithsonian Institution.

City of Carson 2004—City of Carson, General Plan, Protection of Historical Resources http://ci.carson.ca.us/content/files/pdfs/GenPlan/Chapter09.ParksRecreation.pdf

Jerrils 1972—Jerrils, Jack E., *The History Of A City*: *Carson*, Carson, Calif: Carson.

Moratto 1984—Moratto, Michael, J. *California Archaeology*, San Diego, Calif.: Academic Press.

Rawls and Bean 1968—Rawls, James. J., and W. Bean, *California: An Interpretive History*, New York: McGraw-Hill, Inc.

Robinson 1979—Robinson, W. W., *Land in California: The Story of Mission Lands, Ranchos, Squatters, Mining Claims, Railroad Grants, Land Scrip, Homesteads*, Berkeley, Calif.: University of California Press.

Wallace 1955—Wallace, William J., "A Suggested Chronology for Southern California Coastal Archaeology," *Southwestern Journal for Anthropology*, Vol. 11, No. 3, pp. 214–230.

Wallace 1978—Wallace, William, J., "Post-Pleistocene Archaeology 9000-2000 B.C.," in *Handbook of North American Indians*, Vol. 8, pp. 25–36. Robert F. Heizer, ed., Washington, D. C.: Smithsonian Institution.

Watson 2009a—Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification , Volumes I &II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009f—Watson Cogeneration Company/Thomas A. Lu. Confidential Cultural Resources Technical Report for the Watson Cogeneration Steam and Electric Reliability Project, Carson, Los Angeles County, California, dated 2/27/09. Submitted to CEC/Docket Unit on 3/19/09.

Warren 1968—Warren, Claude. N. "Cultural Tradition and Ecological Adaptation on the Southern California Coast," *Eastern New Mexico University Contributions in Anthropology,* Vol.1, No. 3, pp. 1–15.

SOIL AND WATER RESOURCES

Mark Lindley, P.E. and Philip Luecking, P.E.

SUMMARY OF CONCLUSIONS

The California Energy Commission (Energy Commission) staff has not identified any immitigable potentially significant impacts to Soil and Water Resources for Watson Cogeneration Steam and Electric Reliability Project (BP Watson) and believes that the BP Watson project would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) provided the proposed conditions of certification are implemented.

Energy Commission staff has identified the following issues that should be resolved prior to completion of the Final Staff Assessment (FSA):

- As currently proposed, the BP Watson project does not comply with the Los Angeles County Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) Permit and could result in potentially significant adverse impacts to water quality related to the discharge of untreated stormwater from the site. The BP Watson project did not propose a numerically-sized water quality Best Management Practice (BMP) for stormwater discharge as required by the Los Angeles County Municipal Stormwater NPDES Permit (MS4 Permit). The BP Watson project should identify and implement an approach for water quality treatment BMPs to handle stormwater runoff for all portions of the existing Watson Cogeneration facility that will be modified through the development of the proposed project. To provide an integrated approach to stormwater management, it would be preferable for the water quality BMPs to address all site runoff (including the existing Watson Cogeneration facility) to expand the project's benefits.
- The BP Watson project revised the estimates of water supply in the most recent Data Responses. However, Energy Commission staff could not reconcile the most recent estimates of water supply in Revised Table 5.5-9 and Table 5.5-4 in the Application for Certification (AFC). The BP Watson project should consider revising the Water Balance presented in Table 5.5-4 in the Application for Certification (AFC) to illustrate where the 45% of the steam to the HRSGs is returned to the system. Energy Commission staff is concerned that this returned steam is not accounted for in the 86% efficiency goal.

Energy Commission staff concludes the following:

- Implementation of BMPs during the BP Watson project construction and operation in accordance with effective Storm Water Pollution Prevention Plans, a Drainage Erosion and Sediment Control Plan, and Standard Urban Stormwater Management Plan would avoid significant adverse effects that could otherwise result in significant transport of sediments or contaminants from the site by wind or water erosion.
- Use of reclaimed water for the BP Watson project water supply is consistent with Energy Commission water policy and will be beneficial to the State's fresh water supplies by decreasing the use of fresh water from the State Water Project and Colorado River.

- Use of reclaimed water for theBP Watson project water supply will also benefit groundwater resources in the vicinity of the project site by reducing groundwater pumping, improving drawdown and helping to limit seawater intrusion.
- The project would not be located within the 100-year flood plain, and would not increase flood conditions downstream of the project.
- The discharge of wastewater under the conditions stipulated in the BP Carson Refinery's Industrial Wastewater Discharge Permit would meet Los Angeles County Sanitation District's wastewater standards.

Where the potential for impacts has been identified, staff is proposing mitigation measures to reduce the impact to less than significant. The mitigation measures, as well as specifications for LORS conformance, are included as conditions of certification.

INTRODUCTION

This section analyzes potential impacts to soil and water resources from the construction and/or operation of the Watson Cogeneration Steam and Electric Reliability Project (BP Watson) proposed by Watson Cogeneration Company (Watson). The analysis specifically focuses on the potential for the project to cause impacts in the following areas:

- Whether the project's use of water would deplete existing supplies and impact current users or the environment.
- Whether project construction or operation will lead to degradation of surface or groundwater quality including through the alteration of runoff patterns.
- Whether construction or operation will lead to accelerated wind or water erosion and sedimentation including through the alteration of runoff patterns.
- Whether the project will increase runoff or otherwise exacerbate flood conditions in the vicinity of the project.
- Whether the project will comply with all applicable laws, ordinances, regulations and standards (LORS) (including Waste Discharge Requirements).

Where the potential for impacts are identified, California Energy Commission (Energy Commission) staff has proposed mitigation measures to reduce the significance of the impact, and as appropriate, has recommended conditions of certification.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Federal, state, and local LORS that apply to the BP Watson project related to soil and water resources are summarized below in **Soil and Water Table 1**. Energy Commission staff has reviewed the project as proposed by the Watson to determine if the proposed project will meet the requirements set forth in the federal, state, and local LORS.

Soil & Water Table 1
Laws, Ordinances, Regulations, and Standards

Federal LORS	
Clean Water Act (33 U.S.C. Section 1251 et seq.)	The Clean Water Act (33 USC § 1257 et seq.) requires states to set standards to protect water quality, which includes regulation of stormwater and wastewater discharges during construction and operation of a facility. California established its regulations to comply with the Clean Water Act under the Porter-Cologne Water Quality Control Act of 1967. These are normally addressed through a general National Pollutant Discharge Elimination System (NPDES) permit. For BP Watson, regulation of water quality is administered by the Central Valley Regional Water Quality Control Board (CVRWQCB).
Resource Conservation and Recovery Act	The Resource Conservation Recovery Act (RCRA) of 1976 (42 USC§ 6901 et seq., implemented at 40 Code of Federal Regulations (CFR) Part 260 et seq.) seeks to prevent surface and groundwater contamination, sets guidelines for determining hazardous wastes, and identifies proper methods for handling and disposing of those wastes.
40 Code of Federal Regulations, Part 423	The provisions of this part of the CFR are applicable to discharges resulting from the operation of a generating unit by an establishment primarily engaged in the generation of electricity for distribution and sale which results primarily from a process utilizing fossil-type fuel (coal, oil, or gas) or nuclear fuel in conjunction with a thermal cycle employing the steam water system as the thermodynamic medium.
State LORS	
California Constitution, Article X, Section 2	This section requires that the water resources of the State be put to beneficial use to the fullest extent possible and states that the waste, unreasonable use or unreasonable method of use of water is prohibited.
The California Safe Drinking Water and Toxic Enforcement Act	This Act (California Health & Safety Code Section 25249.5 et seq.) prohibits actions contaminating drinking water with chemicals known to cause cancer or possessing reproductive toxicity. The Regional Water Quality Control Board (RWQCB) administers the requirements of the Act.
The Porter-Cologne Water Quality Control Act of 1967, Water Code Sec 13000 et seq.	Requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. Those regulations require that the RWQCBs issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
California Water Code Section 13260	Requires filing with the appropriate RWQCB a report of waste discharge that could affect the water quality of the state, unless the requirement is waived pursuant to Water Code section 13269.
California Water Code Section 13552.6	Specifically identifies the use of potable domestic water for cooling towers, if suitable reclaimed water is available, as a waste or unreasonable use of water. The availability of reclaimed water is determined based on criteria listed in Section 13550 by the SWRCB. Those criteria include provisions that the quality and quantity of the reclaimed water are suitable for the use, the cost is reasonable, the use is not detrimental to public health, and the use will not impact downstream users or biological resources.
California Code of Regulations, Title 17	Title 17, Division 1, Chapter 5, addresses the requirements for backflow prevention and cross connections of potable and non-potable water lines for projects that utilize reclaimed water.

California Code of Regulations, Title 22	Title 22, Division 4, Chapter 15, requires the California Department of Public Health (DPH) to review and approve the wastewater treatment systems to ensure they meet tertiary treatment standards allowing use of recycled water for industrial processes such as steam production and cooling water. DPH also specifies Secondary Drinking Water Standards in terms of Consumer Acceptance Contaminant Levels, including TDS ranging from a recommended level of 500 mg/l, an upper level of 1,000 mg/l and a short term level of 1,500 mg/l.
California Code of Regulations, Title 23	Title 23, Division 3, Chapter 15, requires the RWQCB to issue Waste Discharge Requirements specifying conditions for protection of water quality as applicable.
Local LORS	
Los Angeles County, Municipal Storm Water NPDES permit	Requires the development of a Standard Urban Stormwater Mitigation Plan (SUSMP).
Los Angeles County Grading Guidelines	Provides regulations and submittal requirements for grading projects.
Los Angeles County Building Code, Title 26	Provides regulations for building permits.
City of Carson General Plan, Water Quality Policies and Programs	These policies are intended to control the potentially significant impacts of development including non-point sources of water pollution, urban runoff, grading, construction, and agricultural activities.
State Policies and Guidance	
SWRCB Res. 2009-0011 (Recycled Water Policy)	This policy supports and promotes the use of recycled water as a means to achieve sustainable local water supplies and reduction of greenhouse gases. This policy encourages the beneficial use of recycled water over disposal of recycled water. This policy states the following recycled water use goals: • “Increase the use of recycled water over 2002 levels by at least one million acre-feet per year (AF/y) by 2020 and by at least two million AF/y by 2030; • Increase the use of stormwater over use in 2007 by at least 500,000 AF/y by 2020 and by at least one million AF/y by 2030; • Increase the amount of water conserved in urban and industrial uses by comparison to 2007 by at least 20% by 2020; and Included in these goals is the substitution of as much recycled water for potable water as possible by 2030.
SWRCB Resolutions 75-58 and 88-63	The principal policy of the SWRCB that addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (adopted by the Board on June 19, 1976, by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. Resolution 75-58 defines brackish waters as “all waters with a salinity range of 1,000 to 30,000 mg/l” and fresh inland waters as those “which are suitable for use as a source of domestic, municipal, or agricultural water supply and which provide habitat for fish and wildlife”. In a May 23, 2002 letter from the Chairman of the SWRCB to Energy Commission Commissioners, the principal of the policy was confirmed “that

	the lowest quality cooling water reasonably available from both a technical and economic standpoint should be utilized as the source water for any evaporative cooling process utilized at these facilities." Resolution 88-63 defines suitability of sources of drinking water. The total dissolved solids must exceed 3,000 mg/L for it not to be considered suitable, or potentially suitable, for municipal or domestic water supply.
Integrated Energy Policy Report (Public Resources Code, Div. 15, Section 25300 et seq)	In the 2003 IEPR, consistent with SWRCB Policy 75-58 and the Warren-Alquist Act, the Energy Commission adopted a policy stating they will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound." Additionally, the Energy Commission will require zero liquid discharge technologies unless such technologies are shown to be "environmentally undesirable" or "economically unsound".
California Water Code Section 461	Encourages the conservation of water resources and the maximum reuse of wastewater, particularly in areas with limited water supply.
National Resources Conservation Service (NRCS), National Engineering Handbook, Sections 2 and 3 (1983)	Sections 2 and 3 of the USDA-NRCS National Engineering Handbook (1983) provide standards for soil conservation and erosion prevention during construction activity.

REGIONAL SETTING

The BP Watson project is located in the City of Carson, in Los Angeles County. The project is located on the southwest edge of the Los Angeles Basin, which is an alluvial plain bounded by mountains to the north and east and the Pacific Ocean to the south and west. The elevation at the BP Watson site is approximately 32 feet above mean sea level (MSL). The project is located within the existing BP Carson Refinery and the surrounding areas are highly developed.

As shown in **Socioeconomics Figure 1**, the total minority population within a six-mile radius of the proposed project is 79.21%, raising the concern about environmental justice from disproportional project impacts based on minority status.

Regional Water Resources

The BP Watson site is situated between the Santa Monica Mountains to the north; Santa Ana Mountains and the San Joaquin Hills to the east; and the Pacific Ocean to the south and west. The Pacific Ocean is approximately 8.5 miles west of the project site, with Long Beach Harbor approximately five miles south of the site.

Municipal water in the project vicinity is provided by California Water Services Company. The water supply for the Carson area includes a combination of imported water from the Colorado River and State Water Project (70 to 80%) and groundwater pumped from local wells (20 to 30%).

Climate

The California South Coastal area surrounding the BP Watson site is characterized as semi-arid with long, dry summers and mild winters. The average annual precipitation, recorded at the Long Beach weather station, is 12.6 inches, with the majority of rainfall occurring between November and April. The average annual temperature is approximately 63 degrees Fahrenheit (Watson, 2009a). The average annual reference evapotranspiration as measured at Long Beach is approximately 46 inches (CIMIS 2009a). The length of the growing season in the South Coast area is 365 days.

Surface Water

The primary drainage system in the area is the Dominguez Channel, which is located approximately 0.4 mile east of the BP Watson site. The Dominguez Channel originates southeast of Los Angeles International Airport. From its origin, it flows south, past the project site until it joins the East Channel of the Los Angeles Harbor, north of Terminal Island. The drainage basin of Dominguez Channel is approximately 80 square miles and includes the entire project site.

The average annual discharge into the Dominguez Channel from the basin is estimated to be about 16,000 acre-feet. In the vicinity of the project, the channel has a bottom width of 80 feet with a flood depth capacity of approximately 27 feet. The channel banks are lined with rip rap. Additionally, the portion of this channel adjacent to the BP Carson Refinery is classified as an estuary. This portion of the channel exhibits strong marine water quality influence during drier months and fresh water quality during periods of storm runoff (Watson, 2009a). The project site is designated by the City of Carson as a zone “C” flood zone for flood management indicating the potential for flooding is low with shallow flooding possible during runoff events exceeding a 100-year return period (Carson, 2004). Directly adjacent to the site, the Dominguez Channel is designated as a zone AR floodway by the City of Carson indicating that the Dominguez Channel has capacity for the 100-year flood flow.

Groundwater

The BP Watson site is located in the South Coast Hydrologic Region and the West Coast Subbasin of the Coastal Plain of the LA Basin (West Coast Basin). The West Coast Basin is bounded by the Ballona Escarpment to the north, the Newport-Inglewood fault zone to the east and the Pacific Ocean to the south and west. The total surface area of the West Coast Basin is approximately 91,300 acres. The Los Angeles River and San Gabriel River cross the surface of this subbasin before emptying into San Pedro Bay (DWR, 2003).

The water-bearing deposits include unconsolidated and semi-consolidated marine and alluvial sediments. The Silverado aquifer, which underlies most of the subbasin is the most productive and yields 80-90% of annual groundwater extractions. The storage capacity of this aquifer is estimated to be 6.5 million acre-feet. The average specific yield for the subbasin is 13%. The West Coast Basin was adjudicated in 1961 (DWR, 2003).

The primary source of groundwater replenishment in the West Coast Basin is underflow across the Newport-Inglewood fault zone from the Central Basin. The regional groundwater flow pattern is southward and westward from the Central Coastal Plain toward the Pacific Ocean. Water levels in the subbasin have risen approximately 30 feet since the basin was adjudicated (DWR, 2003). Groundwater is pumped throughout the basin for municipal and industrial uses by both public and private entities.

The quality of groundwater in the subbasin is variable. The groundwater in the Gaspur zone is sodium bicarbonate in character. The Gardena zone has a calcium-sodium bicarbonate character and is of good quality. The Silverado zone is highly variable, calcium chloride in character near the coast to sodium bicarbonate towards inland areas (DWR, 2003).

Seawater intrusion has degraded the water quality in the Gaspur and Silverado zones. Injection wells are used to limit the landward movement of seawater into the basin. Two seawater barrier projects are currently in operation. The West Coast Basin Project creates a north-south trending mound of freshwater from the LA International Airport to the Palos Verde Hills and the Dominguez Gap Barrier Project creates a mound of freshwater near Wilmington. Additional replenishment is provided by infiltration from the Los Angeles and San Gabriel Rivers (DWR, 2003).

PROJECT, SITE AND VICINITY DESCRIPTION

The proposed BP Watson project would be an expansion of the existing 385 megawatt Watson Cogeneration steam and electrical generating facility (Watson Cogeneration) located within the BP Carson Refinery. The BP Watson project would add one 85 megawatt General Electric combustion gas turbine (CTG) with a heat recovery steam generator (HRSG) to provide additional process steam to the BP Carson Refinery. The proposed CTG and HRSG would be constructed adjacent to the four existing CTG and HRSG systems to operate as a “fifth train” in parallel with the four existing generating trains. The fifth train would complete the original design of the Watson Cogeneration facility. Additional auxiliary equipment would include inlet air filters with foggers, one Boiler Feed Water Pump (BFW), one circulating water pump, two natural gas compressors, and generator step-up transformers and auxiliary transformers. Two new cells would also be added to the existing mechanical draft cooling tower to provide heat rejection for the two existing condensing steam turbine generators (STG). The auxiliary equipment would be located within the existing Watson Cogeneration facility (Watson, 2009a).

The primary objective of the BP Watson project is to improve the reliability and to provide additional steam supply to the BP Carson Refinery. The project would be a base loaded cogeneration facility with operations planned for 24 hours per day, 7 days per week. A portion of the electricity would be used by the BP Carson Refinery, while excess power produced by the project would be exported to the power grid. Since power generation is a secondary objective to steam generation, the BP Watson project would operate to maximize steam production by incorporating heavily fired duct burners in the HRSG to maximize steam production for the BP Carson Refinery.

The BP Watson site is located in the City of Carson in Los Angeles County, approximately 0.7 mile south of the 405 Freeway. The site is roughly bounded by East 223rd Street to the north, Wilmington Avenue to the west, East Sepulveda Boulevard to the south and South Alameda Street to the east. The project site is a discontiguous 2.5 acre brown field site located within the boundary of the existing Watson Cogeneration facility. The project site is currently paved and graveled with minimal slope. The existing

Watson Cogeneration facility is approximately 22 acres within the larger 428 acre BP Carson Refinery.

The construction laydown and parking area would be located approximately one mile southeast of the project site at 2149 East Sepulveda Boulevard. This 25-acre parcel is paved and currently used as a truck parking and staging area. The project area is zoned as Heavy Industrial and is surrounded by refineries and industrial facilities. No agricultural uses exist within the one-mile radius surrounding the BP Watson site and laydown area (Watson, 2009a).

The BP Watson project would rely on existing supply and delivery lines. No offsite improvements such as water and gas supply lines or transmission lines are proposed for the BP Watson project.

Soils

The soils at the proposed BP Watson site are primarily sandy loam and fine sandy loam with loam, silt loam or light clay loam. The soils at the project site are in Hydrologic Soil Group C, well-drained with moderately slow permeability (Watson, 2009a). The soils descriptions are based upon soil mapping units developed by the Natural Resources Conservation Service (NRCS). The BP Watson site consists of the Zamora and Ramona series soils. The construction laydown and parking area includes the Sorrento and Hanford series soils. The soils within both the BP Watson site and laydown area are Urban Land soils that have been modified with several feet of additional fill material to accommodate large industrial, housing, or other types of urban development. The construction laydown area is paved and is not expected to require any soil disturbance. The primary soil types located at the proposed project site and laydown area are described below in **Soil & Water Table 2.** Additional soil characteristic data can be found in Table 5.4-1 of the Application for Certification (AFC) (Watson, 2009a).

The project site and construction laydown area are both relatively flat. Some excavation and grading would be required at the relatively flat 2.5 acre project site while no land disturbance is planned for the paved 25 acre construction laydown and parking area. The relatively flat condition and minimal grading required at the BP Watson site would limit the potential for soil erosion due to water. Approximately 7,000 cubic yards of material will be excavated for foundations. This material would be removed and stockpiled for use as fill material onsite. No imported fill material is anticipated as onsite material is expected to be adequate for construction. Portions of the existing natural gas supply line will need to be relocated to serve the proposed fifth train. The route and areas of relocation of this large diameter pipeline have not been determined at this time but would be fully contained within project site.

Soil & Water Table 2

Primary Soil Types Potentially Affected & Characteristics

Primary Soil Name	Slope Class	Water Erosion Potential	Wind Erosion Potential	Permeability	Land Capability Class
Hanford sandy loam or fine sandy loam	0 to 15%	Moderate	Moderate	Moderately rapid	3e (non-irrigated)
Ramona sandy loam or fine sandy loam	0 to 5%	Moderate	Moderate	Moderately slow	3e (non-irrigated)
Sorrento heavy loam	0 to 15%	Moderate	Moderate	Moderate to moderately slow	3e (non-irrigated)
Zamora Fine sandy loam, loam, silt loam, or light clay loam	0 to 9%	Moderate	Moderate	Moderately slow	3e (non-irrigated)

Watson, 2009a, Section 5.4.1.1

There are no major limitations and few overall limitations for the soils at the project site. A geotechnical investigation was performed at the site in 1986 prior to construction of the Watson Cogeneration facility. An additional site-specific geotechnical investigation will be performed prior to construction activities for the BP Watson project.

Expansive soils are known to exist in the project area and have the potential to impact the suitability of existing soil as a bearing surface for the foundations. It may be necessary to amend these soils to mitigate potential impacts related to the expansive soils. It may also be necessary to import fill material to stabilize these soils prior to construction of the fifth train. Watson has not identified a source or volume of imported fill planned for grading activities at the site at this time. It is anticipated that the planned geotechnical investigation will directly address the presence of expansive soils at the project site and identify any required amendments to the existing soils (Watson, 2010a) [Refer to Comments 4.9.1 and G.1].

Soil and Groundwater Contamination

The BP Watson project site was developed with a retention basin for BP Carson Refinery use prior to its current use as a maintenance area for the existing Watson Cogeneration facility. A Phase I Environmental Site Assessment (ESA) was conducted for the BP Watson site in 2008 and completed in January 2009.

The Phase I ESA found recognized environmental conditions for the BP Watson site, both onsite and offsite. The current and historical uses of the BP Watson site within the larger Watson Cogeneration facility and BP Carson Refinery indicate that contaminants of concern include but are not limited to hazardous substances used in petroleum refining and maintenance operations. A limited soil investigation at the site in 1985 found evidence of hydrocarbons in the fill and underlying native soils. ~~The findings of~~

~~the Phase I ESA recommended a Phase II ESA be performed on the project site.~~

~~The Phase II ESA has not been completed and/or presented by Watson at this time. However,~~ The investigation of soil and groundwater contamination is part of a separate ongoing investigation/remediation by the BP Carson Refinery Project as part of their Cleanup and Abatement Order (CAO). During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint. The samples will be analyzed to investigate the potential petroleum hydrocarbon impacts on the subsurface soils. During the Project geotechnical assessment and construction activities, any excavated soil will be managed pursuant to applicable BP Carson Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site-specific health and safety plan and applicable BP Carson Refinery procedures [Refer to Comment 4.9.2]. Watson recognizes the likelihood of encountering impacted soils during excavation and construction activities. Watson indicates that contaminated soils, if encountered, will be stockpiled onsite and later removed for disposal or treatment and recycling. Watson plans to conduct a pre-assessment to determine if existing soils are subject to additional Federal and State regulations that control excavation of soils impacted by volatile organic compounds (Watson, 2009a). If necessary, engineered fill will be imported to replace excavated materials that are not suitable for reuse.

Stormwater

The BP Watson site is located in the Dominguez Channel watershed. The Dominguez Channel is located approximately 0.4 miles east of the project site and just east of the construction laydown and parking area. The Dominguez Channel is the primary drainage in the vicinity of the project and is classified as an estuary in the reach adjacent to the BP Carson Refinery. The flows in the Dominguez Channel are primarily comprised of stormwater runoff during winter months and industrial runoff effluents made up mostly of cooling water and treated wastewater (Watson, 2009a). Due to the largely industrial and highly urbanized area draining to the Dominguez Channel, the quality of surface water is impaired and the Dominguez Channel estuary is identified as impaired (Watson, 2009a).

The BP Watson site is located within the existing Watson Cogeneration facility and is graveled and paved. Stormwater runoff from the existing Watson Cogeneration facility including the BP Watson site currently drains to a storm drain network that flows easterly toward the Dominguez Channel. The storm drain network is connected to the BP Carson Refinery's existing "clean water system." Runoff collected in this system is discharged directly to the Dominguez Channel under the BP Carson Refinery's NPDES permit. This system includes a valve in the main storm drain line near the discharge point that remains closed during dry weather. Prior to discharge during storm events, the accumulated water is visually inspected for contaminants. If contamination is noted, the water is removed using a vacuum truck and disposed of offsite. Following removal of potentially contaminated water, the valve is opened and stormwater is discharged directly to the Dominguez Channel without additional treatment (Watson, 2009a).

Watson has provided results of water quality sampling and analysis for "clean water system" discharge from the existing Watson Cogeneration facility to the Los Angeles Regional Water Quality Control Board in compliance with the facilities operational

NPDES permit. The sample analysis results from 2007 and 2008 indicate that stormwater discharged from the existing Watson Cogeneration facility had elevated levels of metals (chromium, lead, and zinc), polynuclear aromatic hydrocarbons (PAHs), and fecal coliform and e-coli (BP Carson, 2007 and 2008). These analysis results indicate that the current system relying upon "visual inspection" is not adequate to address hydrocarbon, metals, and other potential contamination that may impact stormwater discharged to the Dominguez Channel.

The BP Watson project would modify the surface drainage of the existing site in the area of the fifth train components. The fifth train would be located within a drivable berm to prevent stormwater run-on from adjacent areas (Watson, 2009a). The area of the fifth train island would be approximately 1.8 acres. Surface runoff from this area would be directed to a number of catch basins distributed around the fifth train island. All collected stormwater runoff would be directed the existing BP Carson Refinery's oily water treatment system. This system includes treatment processes to remove free oil and suspended solids which are reclaimed and reused within the BP Carson Refinery. The treated wastewater is ultimately discharged to the Los Angeles County Sanitation District's joint treatment facility in Carson under the BP Carson Refinery's Industrial Wastewater Discharge Permit No. 16631 (Watson, 2009a).

The southern-most portion of the fifth train island would be separated from the power block by an earth berm and runoff from this area (0.55 acres) would continue to drain to the existing clean water system. In addition, the remainder of the BP Watson site, including the auxiliary equipment (cooling tower cells, transformers, boiler feed water pump) and maintenance shop, would also continue to drain to the clean water system and subsequently discharge to the Dominguez Channel (URS, 2010j). Watson has not identified any water quality treatment BMPs to treat stormwater discharged to the Dominguez Channel during operations.

The BP Watson project would result in a small increase in total stormwater runoff generated at the site by paving areas that are currently covered with gravel. Runoff delivered to the existing Watson Cogeneration facility's clean water system would decrease while the runoff delivered to the BP Carson Refinery's oily water system would increase as surface runoff that is currently directed to clean water system is routed to the oily water system. Watson has indicated that the existing oily water system has sufficient additional storage and treatment capacity to handle the surface runoff generated by the project (URS, 2010j).

The construction laydown and parking area is currently paved and slopes from the north and south ends towards the center at approximately 1% grade. Catch basins collect stormwater runoff and convey it easterly where it is discharged directly to the Dominguez Channel. The proposed project does not include any modifications to the existing drainage at this area. Runoff from the construction laydown and parking area will continue to flow to the Dominguez Channel during and following construction (URS, 2010j).

Groundwater

The existing Watson Cogeneration facility currently uses groundwater to meet a portion of its water supply needs. An average of 1.4 million gallons per day (mgd) or about

1,534 acre-feet per year of groundwater provides about one third of the raw water supplied to the existing Watson Cogeneration facility. This water is combined with municipal water for use at the existing Watson Cogeneration facility (Watson, 2009a). There are nine wells located within the BP Carson Refinery, with three currently in service. Groundwater is supplied to the existing Watson Cogeneration facility from Well 13, located at northern end of the BP Carson Refinery (Watson, 2009a).

The groundwater basin was adjudicated in the 1940's by the Los Angeles County Court. The BP Carson Refinery utilizes groundwater within the original water rights assigned to the site. In addition, the BP Carson Refinery leases groundwater rights from surrounding properties. During the rainy season, pumping from onsite wells is curtailed to allow for increased groundwater recharge in the basin, and the existing Watson Cogeneration facility relies on additional municipal supply derived from surface water supplied by the State Water Project and the Colorado River and local groundwater (Watson, 2009a).

The BP Watson project would use a reclaimed water source to meet its full water demand. Following construction of the BP Watson project, the existing Watson Cogeneration facility would rely on a combination of reclaimed water and municipal water to provide water supply. Groundwater would only be used by the BP Watson project and the existing Watson Cogeneration facility as a backup supply in the event of a disruption in the reclaimed water and/or municipal supply (URS, 2010j).

The groundwater table ranges from 10 to 40 feet below MSL across the BP Carson Refinery site. At the BP Watson site, the water table is approximately -25 to -29 feet MSL, which is approximately 60 feet below the ground surface. The average gradient across the site is approximately 0.003 feet/feet (Watson, 2009a). A geotechnical report performed for the project site in 1986 indicated that water was not found during subsurface investigations to a depth of 65 feet. It is not anticipated that groundwater will be encountered during construction of the BP Watson project and dewatering will not likely be required. An additional geotechnical investigation is planned for the project site to support detailed design activities (Watson, 2009a).

Project Water Supply

The BP Watson project will require water for construction and operational uses. The existing Watson Cogeneration facility currently uses 5,607 AFY. The proposed BP Watson project would use 7,371 AFY (URS, 2010a).

During construction, water will be required for dust control, moisture conditioning (for compaction), and other uses. This water will be provided by the reclaimed water from the BP Carson Refinery. Watson estimates that about 20,000 gallons per month will be required over a 15-month construction period for dust suppression. Potable water will be provided from the existing Watson Cogeneration facility by a bottled water purveyor (Watson, 2009a).

During operations, the BP Watson project would utilize reclaimed water for fire protection, plant service water, cooling tower cell makeup, and CTG inlet air fogger makeup, and feedwater to the HRSG. The BP Watson project proposes to use tertiary treated water (reclaimed water) from the West Basin Municipal Water District (WBMWD) as the primary source of water for operations. The BP Watson project would utilize municipal water from the California Water Service Company as a backup for operational water in the event of a disruption in the supply of reclaimed water. On-site wells may be used to augment this backup supply for water quality purposes.

The BP Carson Refinery is implementing a program, separate from the BP Watson project, to convert industrial water uses to reclaimed supplies. The BP Carson Refinery intends to receive nitrified and reverse osmosis (RO) reclaimed water from WBMWD for a portion of operational water needs at the existing Watson Cogeneration facility, BP Watson project, and the BP Carson Refinery. The BP Watson project would only use reclaimed water provided by WBMWD as part of the BP Carson Refinery's reclaimed water program.

A Will Serve letter indicates that the BP Carson Refinery will be able to provide sufficient reclaimed water for the proposed fifth train. A Memorandum of Understanding between WBMWD and the BP Carson Refinery indicates that approximately 5,806 afy of reclaimed water would be supplied to the BP Carson Refinery (URS, 2010k). The BP Carson Refinery and the WBMWD are evaluating supply options and WBMWD is preparing a Feasibility Study for the expansion of its recycled water facilities. It is anticipated that the conversion to reclaimed supplies for use at the existing Watson Cogeneration facility and the BP Watson project will occur in two phases. The first phase would supply nitrified reclaimed water to cover the requirements of the existing cooling tower cells and the two new cells proposed as part of the BP Watson project. This phase is currently expected to be completed in December 2012. The second phase would supply reverse osmosis water to cover the boiler feed water requirements of the BP Watson project and a portion of the requirements at the existing Watson Cogeneration facility. The second phase is currently expected to be completed between December 2012 and July 2013. The BP Watson project is scheduled to begin commercial operation in December 2012 (URS, 2009b).

Since the primary purpose of the BP Watson project is to provide steam to the BP Carson Refinery, total water supply for the BP Watson project would be significantly greater than for a combined cycle generating facility of a similar capacity that primarily generates electricity. The average annual water demand for the BP Watson project would be approximately 3,015 acre-feet. This total demand includes approximately 2,855 afy of RO water and 160 afy of nitrified water. The BP Watson project would have an average daily consumption of 2.69 million gallons and a maximum daily consumption of 2.93 million gallons of reclaimed water (Watson, 2009a). The BP Watson project would supply approximately 1.88 mgd or 2,111 afy of process steam and 0.33 mgd or 369 afy of high pressure water to the BP Carson Refinery (Watson, 2009a). The net water supply for the BP Watson project, i.e. total water supply less the steam and water supplied to the BP Carson Refinery, is about 535 afy or about 6.3 afy/MW, which is typical for wet cooled combined cycle power plants in California.

The BP Watson project would also utilize about 30 gpm or about 48 afy for evaporative cooling of inlet air for the combustion turbine generators to increase power output. The proposed two additional mechanical draft cooling tower cells would use approximately 272 gpm or 439 afy of reclaimed water. There will be approximately 3.4 cycles of concentration of the combined cooling tower makeup, which includes second pass RO reject water, nitrified reclaimed water and onsite recovered water (Watson, 2009a).

Water usage rates are summarized below in **Soil & Water Table 3.**

Soil & Water Table 3

BP Watson Water Usage Rates

Water Use	Average Daily (mgd)	Maximum Daily (mgd)	Average Annual (acre-feet)
First Pass RO Reclaimed Water	2.55	2.58	2,855
Nitrified Reclaimed Water	0.14	0.34	160
Total Reclaimed Water from WBMWD	2.69	2.93	3,015
Process Steam to BP Carson Refinery	1.88	1.88	2,111
High Pressure Water to BP Carson Refinery	0.33	0.34	369
Evaporation – Wet Cooled Condenser[1]	0.28	0.41	310
Evaporation – CTG Inlet Air Coolers	0.07	0.4	48
Net Water Supply (Supply less Steam & Water to Refinery)	0.48	0.71	535

BPW, 2009a Table 5.5-4,
[1] Evaporation from Wet Cooled Condenser includes both steam and drift (water droplets) discharged from cooling towers

Watson indicates that the existing Watson Cogeneration facility currently receives approximately 45% of water supplied as steam to its HRSG as returned condensate from its STGs and the BP Carson Refinery. This condensate displaces the use of untreated water by the cogeneration facility. The BP Watson project will also utilize this condensate supply to reduce project water consumption (URS, 2010a). However, it is unclear to Energy Commission staff how the reduction in total water supply would be split between BP Watson and the existing Watson Cogeneration facility – ideally Watson could update the water balance (AFC Table 5.5-4) to include the condensate return [Refer to Comment 4.9.3].

The water supply for the BP Watson project will be provided using the BP Carson Refinery's supply lines for RO water and nitrified water. The RO water would be the primary source of process water for the project. The RO water would require additional treatment by second pass RO prior to use for steam generator (HRSG) makeup and CTG inlet fogger supplies. This water may also require conditioning prior to its use. Cooling tower makeup water would be provided by second pass RO treatment reject water augmented by nitrified reclaimed water. Cooling tower water would be chemically conditioned with sulfuric acid to reduce alkalinity and to control scaling, polymeric dispersant to further inhibit scale, and sodium hypochlorite to prevent bio-fouling.

Potable water would be provided from the connection at the existing Watson Cogeneration facility. The potable water is supplied by California Water Services Company. Potable water will be utilized for eye wash stations, safety showers, and domestic uses. Watson did not provide an estimate of the anticipated potable water use by the BP Watson project. However, it is not expected that potable supply would be considerably higher than potable use at the existing Watson Cogeneration facility.

Process and Sanitary Wastewater

Wastewater streams from the existing Watson Cogeneration facility including process wastewater, cooling tower blowdown, boiler blowdown, boiler feedwater reject, and stormwater runoff from contact areas are routed to the BP Carson Refinery's oily-water treatment system. The oily-water treatment system removes free oil and suspended solids, which are recovered and reused at the BP Carson Refinery. Treated wastewater is delivered to a storage tank at the BP Carson Refinery before being discharged to the LA County Sanitation District's joint treatment facility in Carson. Solids remaining from the hydrocarbon recovery process are disposed of offsite as a hazardous waste at a Resource Conservation and Recovery Act (RCRA) approved incineration facility (Watson, 2009a).

The BP Watson project would also discharge wastewater to the BP Carson Refinery oily-water treatment system. The primary source of wastewater would be cooling tower blowdown water which will consist of nitrified reclaimed water and RO reject water concentrated through evaporative losses in the cooling towers. The wastewater would also include residual chemicals used to control scaling and bio-fouling of the cooling towers (Watson, 2009a).

Process wastewater from the boiler feedwater treatment system would also be discharged to the BP Carson Refinery oily-water treatment system. The boiler feedwater system would use a lime/zeolite softening process that generates a lime slurry that would be routed to holding tanks to allow solids to settle out of suspension. The remaining liquids would be returned to the process wastewater stream. A brine solution utilized to regenerate the zeolite softener would be discharged to the process wastewater stream.

As discussed above, stormwater from the power block area would also be discharged to the BP Carson Refinery oily-water treatment system. In addition, wastewater and stormwater from equipment drains that may contain oil would be discharged to the oily-water treatment system.

The industrial wastewater generated by the BP Watson project would be approximately 80 gpm on average and 138 gpm as a maximum. The daily volume of industrial wastewater would be approximately 134,000 gallons on average with a maximum of approximately 199,000 gallons (Watson, 2009a).

The stormwater runoff from the BP Watson project discharged to the BP Carson Refinery's oily-water system would be highly variable depending on rainfall. The estimated 100-year, 24 hour peak discharge from the fifth train is approximately 9.1 cfs or 4,090 gpm. The total volume generated by the 100-year event is estimated to be 42,983 cubic feet or 320,839 gallons. The maximum discharge condition would occur with the maximum daily wastewater production coupled with the 100-year storm. The peak discharge to the oily water treatment system would be approximately 4,229 gpm. The storage capacity of the existing tanks, basins, and reservoirs associated with BP Carson Refinery's oily water treatment system is approximately 115 million gallons or about 15.4 million cubic feet (URS, 2010a).

The wastewater discharge limits are set forth in the industrial waste discharge permit for the BP Carson Refinery. The BP Carson Refinery has provided a letter to Watson acknowledging that the oily water treatment system has sufficient capacity to accept the waste stream from the fifth train while meeting its permitted discharge requirements (Watson, 2009a).

The existing sanitary system for the Watson Cogeneration facility discharges to a sanitary sewer that delivers wastewater to the LA County Sanitation District. This connection is designed for the sanitary flow from the administration and control building and will not change as part of the BP Watson project (Watson, 2009a). The sanitary waste drains for the project will connect to the existing system at the Watson Cogeneration facility.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section provides an evaluation of the expected direct, indirect and cumulative impacts to soil and water resources caused by construction, operation and maintenance of the project. Energy Commission staff's analysis of potential impacts consists of a brief description of the potential effect, an analysis of the relevant facts, and application of the threshold criteria for significance to the facts. If mitigation is warranted, Energy Commission staff provides a summary of Watson's proposed mitigation and a discussion of the adequacy of the proposed mitigation. If necessary, Energy Commission staff presents additional or alternative mitigation measures and refers to specific conditions of certification related to a potential impact and the required mitigation measures. Mitigation is designed to reduce potentially significant project impacts to a level that is less than significant.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

Potential impacts including depletion of local/regional water supplies, increased flooding, decreased water quality, and soil erosion are among those Energy Commission staff examined to determine potentially significant impacts associated with the proposed project. Overall, Energy Commission staff evaluates if the project can be built and operated without violating erosion, sedimentation, flood, surface or groundwater quality, water supply, or wastewater discharge standards including through the alteration of drainage patterns or an increase in runoff. There are extensive regulatory programs in effect that are designed to prevent or minimize these types of impacts through the implementation of Best Management Practices (BMPs). Our experience with these programs has demonstrated that they are effective. Therefore, absent unusual circumstances, we conclude that the threshold of significance for these potential impacts is based upon the ability of an Applicant to identify and implement BMPs and to limit erosion or contamination to a level where these impacts will be less than significant.

Soils

Soils can be adequately protected by development and implementation of a proper Drainage Erosion and Sediment Control Plan (DESCP) to meet the Energy Commission's requirements and a Storm Water Pollution Prevention Plan (SWPPP) to meet the State Water Resources Control Board's requirements as applicable for both construction and operational phases of the project. The LORS and Policies presented in **Soil & Water Table 1** were used to determine the threshold of significance of project impacts for this proceeding.

Water

Energy Commission staff reviewed the BP Watson project's proposed stormwater management plans to determine if current standards related to water quality treatment and peak flow mitigation would be met. The current standards as applied by Los Angeles County, the City of Carson, and the California Stormwater Quality Association (CASQA) meet the State Water Resources Control Board's requirements as applicable for both construction and operational phases of the project. The LORS and policies presented in **Soil & Water Table 1** were used to determine the threshold of significance of project impacts for this proceeding.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The direct and indirect impact and mitigation discussion presented below is divided into a discussion of impacts related to construction and operation. For each potential impact evaluation, Energy Commission staff briefly describes the potential effect and applies the threshold criteria for significance to its analysis. If mitigation is warranted, Energy Commission staff provides a summary of Watson's proposed mitigation and a discussion of the adequacy of the proposed mitigation. In the absence of an Applicant-proposed mitigation or if mitigation proposed by Watson is inadequate, Energy Commission staff mitigation measures are recommended. Energy Commission staff also provides specific conditions of certification related to a potential impact and the required mitigation measures.

Construction Impacts and Mitigation

Construction of the BP Watson project will include asphalt removal, demolition of existing structures, soil excavation, soil stockpiling, grading, and connection to existing utility lines. Water will be used primarily for dust suppression and moisture conditioning during construction. Potential impacts to soils related to increased erosion or the release or migration of hazardous materials are possible during construction activities. Potential stormwater impacts could result if increases in the runoff flow rate and volume discharged from the site were to increase flooding downstream. Water quality could be impacted by the discharge of eroded sediments from the site or hazardous materials released during construction. Project water demand could affect quantity of water resources. Potential construction related impacts to soil, stormwater, water quality and quantity, including Watson's and Energy Commission staff's proposed mitigation measures are discussed below.

Soil Erosion Potential

Construction activities can lead to adverse impacts to soil resources including increased soil erosion, soil compaction, loss of soil productivity, and disturbance of soils crucial for supporting vegetation. Activities that expose and disturb the ground surface leave soil particles vulnerable to detachment by wind and water. Soil erosion could result in increased sediment loading to nearby receiving waters including the Dominguez Channel.

The magnitude, extent and duration of those impacts would depend on several factors, including the proximity of the BP Watson site to surface water, the type of soils affected, and the method, duration, and time of year of construction activities. Prolonged periods of precipitation, or high intensity and short duration runoff events coupled with earth disturbance activities can result in on-site erosion. In addition, high winds during grading and excavation activities can result in wind borne erosion leading to increased particulate emissions that adversely impact air quality. The implementation of appropriate erosion control measures will help conserve soil resources, maintain water quality, prevent accelerated soil loss, and protect air quality.

Construction of the BP Watson project would permanently disturb approximately 2.5 acres within the existing Watson Cogeneration facility. The construction laydown and parking area is currently paved and will not require additional land disturbance during construction. BP Watson does not include the construction of any off-site linear utilities.

The project site is flat and approximately level with the adjacent existing facilities. During construction activities the existing paving and gravel at the project site would be removed to prepare for the installation of the foundations and other underground facilities. This area would have an increased potential for erosion while the soil is exposed.

In the absence of proper BMPs and due to the soil types, the project earthwork could cause significant fugitive dust and erosion. In reference to **Soil & Water Table 2**, the predominant surface soil classifications on the BP Watson site are coarse to medium in texture and range from sandy loam to light silty clay loam. The soil types have low water erosion potential and moderate wind erosion potential (Watson, 2009a).

Water and Wind Erosion

The BP Watson project site will be subject to wind and water erosion during construction. Project construction is planned over a period of about 24-months (URS, 2010a). Watson anticipates that dust suppression measures will be required during 15 months of the construction period.

Earthwork activities at the site would include removal of existing asphalt and gravel surface material, topsoil, vegetation, and debris; excavation and compaction of earth for the site grades; foundation excavation, and trenching for underground systems. The total volume of soil excavation at the site would be approximately 7,000 cubic yards. This material would be stockpiled on site to be used for fill. Material that is unsuitable for fill due to hazardous material impacts will be disposed of off-site. The potential soil disposal location has not been identified at this time.

The project site is expected to include the presence of expansive soils. Watson indicates that these soils will either be amended (by import of additional soils) to be suitable for construction or be removed and replaced with suitable material. The extent of the expansive soils is unknown at this time. An additional site-specific geotechnical investigation will be performed prior to construction activities for the BP Watson project to help identify areas of expansive soils (Watson, 2009a). Watson estimates that up to 7,000 cubic yards of engineered fill may need to be imported to the site (URS, 2010a).

Watson prepared a preliminary draft Drainage Erosion and Sediment Control Plan (DESCP) that provides conceptual plans for erosion and drainage control measures, including BMPs to be implemented during the construction phase of the BP Watson project. Watson has proposed the following erosion control measures: scheduling to minimize disturbed areas exposed during the rainy season; application of water or dust palliatives to provide dust control at disturbed areas, haul roads, and parking areas; stockpile management including covering; and perimeter sediment barriers. Watson has also proposed the following sediment treatment control measures to trap eroded sediments: use of silt fences; straw bale barriers; storm drain inlet protection; stabilized construction and site entrance/exits; and street sweeping and vacuuming (URS, 2010a). During construction, stormwater runoff from the fifth train power block area would be directed to the BP Carson Refinery's oily water treatment system. Runoff from the southern portion of the fifth train and the remainder of the existing Watson Cogeneration facility, including areas redeveloped as part of BP Watson, would continue to drain to the existing storm drain system and subsequently the Dominguez Channel. The construction laydown area would be separated from the parking area using Jersey barriers (or K-rails) and sand bags. Storm drain inlet protection measures would be used at the existing inlets in the laydown area to prevent sediments from being discharged directly to the Dominguez Channel.

Watson believes that the relatively flat site, the existing stormwater collection system, and the use of construction BMPs will reduce the potential for soil loss and erosion to a negligible level. Watson has indicated that large scale measures such as sediment traps, retention basins and drainage diversions would not be necessary at the project site.

Energy Commission staff agrees that proper application of erosion control and sediment control BMPs can reduce the impact to soil resources from wind and water erosion to a level that is less than significant. During active excavation and along construction roads, watering would need to be applied several times per hour to limit significant wind erosion and fugitive dust emissions, especially during periods of high winds. Routing stormwater runoff from the power block area to the BP Carson Refinery's oily-water treatment system would help limit discharge of eroded sediment to adjacent waterways. The final DESCP should identify the quantities of soil that may be imported or exported from the site, and provide specific BMPs to limit impacts related to wind and water erosion during loading and transport activities. Proper implementation and maintenance of the BMPs outlined in an approved DESCP would limit erosion and migration of soils from the BP Watson site and into downstream waterways including the Dominguez Channel.

Energy Commission staff believes the proposed plans are reasonable at this level of project planning to avoid significant adverse impacts due to wind and water erosion. Condition of Certification **SOIL&WATER-1** would require Watson to prepare a final DESCP for both construction and operations, to assure these BMPs are implemented, and to identify post-construction BMPs to stabilize the project site. Similar to the DESCP and in accordance with federal law, the RWQCB specifies that Watson is to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) for construction activity which is required under Condition of Certification **SOIL&WATER-2**.

Soil and Groundwater Contamination

The Phase I ESA found that current and historic uses of the existing Watson Cogeneration facility and surrounding area within the BP Carson Refinery indicate that soil and groundwater at the BP Watson site could potentially be impacted by hazardous substances used in petroleum and maintenance operations. A limited soil investigation at the site in 1985 found evidence of hydrocarbons in the fill and underlying native soils. ~~A Phase II ESA would provide more detailed information regarding the extent and location of any existing soil and/or groundwater contamination. Following completion of the Phase II ESA, Watson would need to prepare a draft Soil Management Plan (SMP) which would address soil and groundwater contamination and level of associated risks to workers and nearby environments. The SMP should include an ecological risk screening to help guide decisions on the levels of soil contamination that require removal or remediation to protect the environment including the Dominguez Channel adjacent to the site. The SMP would provide instructions for soil handling, stockpiling, and dust and erosion control during construction including BMPs to specifically address impacted soils.~~ During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint, and analyzed to investigate the subsurface soils for petroleum hydrocarbon impacts. During the Project geotechnical assessment and during construction activities, any excavated soil will be managed pursuant to applicable Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site specific health and safety plan and applicable refinery procedures [Refer to Comment 4.9.4].

Watson has indicated that any contaminated materials encountered during construction will be temporarily stockpiled onsite and disposed of offsite in accordance with all applicable LORS. Prior to excavation at the site, a pre-assessment would be conducted to determine if any excavation will need to follow regulations (40 CFR 63 Subpart GGGGG and Air Quality Management District Rule 116) for air emission from excavated soil contaminated with volatile organic compounds (Watson, 2009a). Workers would be instructed on proper BMP management as well as common sense practices to minimize the risk of exposure to soil contaminants. This includes instruction to recognize evidence of contaminated soil and avoiding handling of potentially contaminated material without proper training (Watson, 2009a).

The implementation and routine maintenance of erosion control measures as required by the DESCP, SWPPP, and SMP would limit the potential for existing contaminants to migrate offsite through wind and water borne erosion. See the **Waste Management** Section for further discussion of potential soil and groundwater contamination and conditions of certification proposed for mitigation of any potential impacts due to existing soil and groundwater contamination.

During construction, there is also the potential for hazardous chemicals to be released from construction equipment or materials storage areas which could cause potentially significant soil or groundwater contamination impacts. Watson identified a number of BMPs related to construction equipment in the draft DESCP including: use of a temporary fueling area for construction equipment and use of drip pans or absorbent pads in maintenance areas. Watson indicated that hazardous liquids would be stored in a separate enclosed building within one or more containment facilities. The diesel storage tank will be double walled with the capacity to store 100% of the tank volume to prevent a release in the event of a leak (URS, 2010a).

Energy Commission staff believes that these measures will be effective in preventing migration of existing soil and groundwater contamination and to limit the potential for a release of hazardous materials to cause adverse impacts to soil and groundwater during construction of the proposed BP Watson project. Condition of Certification **SOIL&WATER-2** requires Watson to prepare and implement a SWPPP for construction activity as specified by the RWQCB. The Construction SWPPP would provide details on BMPs for soil stockpile management, construction equipment maintenance and fueling, and hazardous materials storage.

Stormwater

Construction of the BP Watson project could lead to flooding or water quality impacts related to stormwater runoff during the construction period. Flooding in the vicinity of the project site could also increase if peak runoff flow rates discharged from the BP Watson project increase. Water quality could also be adversely impacted if the stormwater drainage pattern concentrates runoff in areas that are not properly protected with BMPs causing erosion of soils and discharge of sediment into down-gradient surface waters. Potentially significant water quality impacts could occur during construction, excavation, and grading activities if contaminated soil or other hazardous materials used during construction were to contact stormwater runoff and drain off-site.

The BP Watson site is located in a highly developed industrial and commercial area within the City of Carson. The project site is located within the existing Watson Cogeneration facility and is covered pavement and gravel. Currently, stormwater runoff from the existing Watson Cogeneration facility including the BP Watson site flows to the existing onsite storm drain system which discharges to Dominguez Channel east of the existing Watson Cogeneration facility.

The construction of the BP Watson project will change the drainage patterns at the existing site. The fifth train power block is approximately 1.8 acres and would be isolated from the remainder of the existing site by the construction of a drivable earthen berm (URS, 2010a). The BP Watson project would utilize both the existing storm water drainage system and existing oily water treatment system during construction. During the initial phases of construction, stormwater would be routed away from the fifth train and the proposed storm drain system would be installed. Stormwater runoff from the fifth train power block area would be captured in a number of catch basins and subsequently routed to the BP Carson Refinery's oily water treatment system. Runoff from the remainder of the power block area, as well as the maintenance shop and transformer areas included in the BP Watson project, approximately 0.7 acres, would continue to discharge to the existing storm drain system during and following construction.

Watson has indicated that there is sufficient capacity in the BP Carson Refinery's existing oily water treatment system to accept the stormwater runoff generated from the BP Watson project. It is estimated that 10-year and 100-year peak runoff from the BP Watson site would increase by approximately 2.5% as compared to existing conditions.

The peak discharge to the oily water treatment system is estimated to be 5.92 cfs and 9.11 cfs for the 10-year and 100-year events, respectively. The estimated volume of runoff to the oily water system would be approximately 27,500 cubic feet and 42,900 cubic feet for the 10-year and 100-year events, respectively. Runoff discharged to the Dominguez Channel would be reduced because runoff from the fifth train power block area would be discharged to the oily water system rather than the storm drain system. This would prevent flooding related impacts downstream of the BP Watson site due to an increase in stormwater runoff.

The construction laydown area will not require any land disturbance and the drainage pattern will not be modified from existing during or following construction. Runoff currently flows to catch basins in the parking lot area which are connected to a storm drain system that discharges to the Dominguez Channel. Stormwater runoff from the laydown area would not increase or cause any flood related impacts along the Dominguez Channel.

Watson prepared a preliminary draft DESCP in response to Energy Commission staff's comments, providing conceptual plans for stormwater management measures during the construction and operation phases of the BP Watson project. Sediment trapping BMPs including: silt fences; straw bale barriers; storm drain inlet protection; stabilized construction and site entrance/exits; and street sweeping and vacuuming would limit discharge of eroded sediment into stormwater runoff (URS, 2010a). Stock pile management BMPs would limit erosion of sediments potentially impacted by hazardous materials into stormwater runoff. Implementation of vehicle fueling and maintenance BMPs and hazardous materials storage BMPs will limit the potential for hazardous materials used during construction to be released into stormwater at the site. Routing of stormwater runoff from the fifth train power block area to the BP Carson Refinery's oily water treatment system will also limit the potential for sediments and hazardous materials to be discharged in stormwater leaving the BP Watson project during construction. The final DESCP will need to identify specific locations for proposed BMPs and provide calculations to demonstrate that numerically sized BMPs meet CASQA and Los Angeles County standards.

Energy Commission staff has reviewed Watson's stormwater management plans and believes that Watson has identified a reasonable conceptual level BMP plan that will avoid significant adverse impacts related stormwater drainage and water quality during construction. Condition of Certification **SOIL&WATER-1** would require Watson to prepare a Final DESCP for both construction and operations. The Regional Water Quality Control Board (RWQCB), in implementing federal law, requires that Watson prepare and implement a SWPPP for construction activity; this is reflected in Condition of Certification **SOIL&WATER-2**. Additionally, Condition of Certification **SOIL&WATER-3** requires Watson to prepare and submit for approval a Standard Urban Stormwater Mitigation Plan (SUSMP) as required under Los Angeles County's MS4 NPDES Permit. The SUSMP will identify pollutants of concern and identify the means to minimize the discharge of these pollutants from the project site including the use of numerical design standards for water quality treatment BMPs.

Energy Commission staff believes that through the proper sequencing construction activities and the application of BMPs, impacts to soil and water resources from stormwater drainage during construction will be reduced to a less than significant level.

Construction Water Supply

Watson has indicated that water will be required for dust suppression and miscellaneous activities during construction. It is estimated that the total water use would be 20,000 gallons per month during the 15-month construction period for a total of 300,000 gallons (Watson, 2009a). The existing reclaimed water system at the BP Carson Refinery will be used to provide construction water. Potable water for the construction workforce will be provided from the existing Watson Cogeneration facility from a bottled water purveyor.

Energy Commission staff believes that construction water supply may be underestimated for periods of significant grading activities. 20,000 gallons per month equates to about 115 gallons per hour which may not be sufficient to control dust at the site and provide moisture for soil compaction during major grading operations. Watson should be prepared to deliver additional water as necessary for dust control and other construction needs. Energy commission staff believes that up to 2,000 gallons per hour may be required to control dust emissions during active grading with moderate to high winds. Energy Commission staff believes that there is adequate water supply available at the existing Watson Cogeneration facility to suppress dust during construction, and do not expect significant wind erosion impacts due to limited construction water supplies. Energy Commission staff believes that the use of reclaimed water from the existing on-site facilities for dust suppression and miscellaneous construction activities will have a less than significant impact on the existing water supply resources.

Groundwater – Dewatering

A geotechnical report performed for the project site in 1986 indicated that water was not found during subsurface investigations to a depth of 65 feet. It is not anticipated that groundwater would be encountered during construction of the BP Watson project facilities and dewatering would not be required during construction. An additional geotechnical investigation is planned for the project site to support detailed design activities (Watson, 2009a). Information gathered during the planned geotechnical investigation would be utilized to further address the potential for groundwater to be encountered during construction activities.

The final DESCP and SWPPP would need to address potential dewatering during construction of BP Watson, including any information obtained during the Phase II site investigation regarding groundwater contamination and required treatment. Watson would need to address any potential groundwater dewatering in the final DESCP and SWPPP above documents in order to meet the Conditions of Certification **SOIL&WATER-1 and -2.**

Wastewater

Construction wastewater generated onsite would include equipment washdown water, water from pressure testing the service utilities, and concrete washout wastewater. Watson has not provided an estimate of the volume of wastewater generated onsite resulting from construction activities. Equipment washdown water and utility pressure testing water would be discharged to BP Carson Refinery's oily water treatment system.

Concrete washout water and slurries would be discharged to an onsite facility for drying. The facility would provide sufficient capacity to contain all concrete washout wastes and wastes collected from any saw cutting operations (URS, 2010a).

Sanitary facilities would consist of portable chemical toilets and a holding tank at the construction office building. It is estimated that during construction, the project would generate approximately 450 gallons of sanitary waste per week (Watson, 2009a).

Improper handling or containment of construction wastewater could cause a broader dispersion of contaminants to soil, groundwater or surface water. The final DESCP and SWPPP should address the total estimated wastewater to be generated during construction, both for discharge to the existing oily water system and for the concrete washout containment. During construction, wastewater (including any groundwater generated by dewatering activities) would be managed with BMPs identified and implemented in accordance with the DESCP consistent with Condition of Certification **SOIL&WATER-1** and the construction SWPPP required by the RWQCB, consistent with Condition of Certification **SOIL&WATER-2**. Energy Commission staff concludes that no significant impacts from construction wastewater will occur provided that all construction wastewater is handled in accordance with BMPs described in the project's construction SWPPP and DESCP.

Operation Impacts and Mitigation

Operation of the BP Watson Project could lead to potential impacts to soil, stormwater runoff, water quality, and water supply. Soils may be potentially impacted through erosion or the release of hazardous materials used in the operation of the BP Watson project. Stormwater runoff from the BP Watson project could result in potential impacts if increased runoff discharged from the site leads to increases in downstream flooding. Water quality could be impacted by discharge of eroded sediments or hazardous materials released during operation. Water supply for plant processes, fire protection, and potable uses could lead to potential impacts to quantity or quality of regional water resources. Wastewater discharge could cause impacts to downstream receiving waters if the quantity or quality of wastewater discharged exceeded the limitations of the wastewater treatment system. Potential impacts to soil, stormwater, water quality, flooding, water supply, and wastewater related to the operation of the BP Watson project including Watson's proposed mitigation measures and Energy Commission staff's proposed mitigation measures, are discussed below.

Soil

During operation of the BP Watson project, the site would be covered with impervious surfaces and gravel leaving no soil exposed. Hazardous materials used in operations of the BP Watson project will be stored at the existing Watson Cogeneration facility in storage areas equipped with curbs or containment dikes to contain spills or leaks. As a result, impacts to soils related to erosion or hazardous materials handling during operations will not be significant.

Condition of Certification **SOIL&WATER-1** requires the implementation and maintenance of drainage and erosion control measures during operations according to plans as specified in the DESCP. Condition of Certification **SOIL&WATER-4** requires the preparation and implementation of an Industrial SWPPP as specified by the RWQCB. The Industrial SWPPP would include BMPs to protect stormwater from impacts related to soil erosion and hazardous materials release. With implementation and maintenance of the BMPs detailed in the required plans, Energy Commission staff believes there would be no significant impacts to soil resources during operation of the BP Watson project.

Stormwater

Energy Commission staff examined several potential impacts to stormwater. The proposed stormwater management plans were examined to determine if the BP Watson project could cause significant flooding or water quality impacts for stormwater discharged from the site. Significant flooding impacts could occur along the Dominguez Channel downstream of the site if runoff peak flow rates or volumes discharged from the BP Watson project increased as compared to existing conditions. Water quality impacts could occur if hazardous materials or eroded sediments were released in runoff discharged from the site.

During operations, the BP Watson site will be paved with asphalt, concrete, and gravel. Stormwater runoff from the 1.8 acre fifth train power block would be routed to the BP Carson Refinery's oily water treatment system and ultimately discharged to Los Angeles County Sanitation District's Wastewater Treatment Plant. Stormwater runoff from the remaining component areas (approximately 0.7 acres) of the BP Watson site would be routed to the existing storm drain system and discharged to the Dominguez Channel.

Energy Commission staff reviewed the storm water runoff calculations provided by Watson to evaluate the potential for flooding impacts along the Dominguez Channel downstream of the BP Watson project. The post development runoff coefficient for the project site will increase slightly over existing conditions due to additional paving planned at the project site. Watson provided runoff calculations for the existing Watson Cogeneration facility for pre-, post-development conditions including the fifth train power block. The pre- and post development discharges for the 10-year and 100-year events are summarized in **Soil & Water Table 4,** below. Based on the hydrology calculations presented, stormwater runoff (peak flow rates and volumes) discharged to the Dominguez Channel from the existing Watson Cogeneration facility would decrease as a result of the BP Watson project because the proposed project would remove 1.8 acres from the area contributing runoff to the existing storm drain system. Energy Commission Staff concluded that the BP Watson project would not create significant flooding related impacts along the Dominguez Channel.

A Will Serve letter from BP Carson Refinery indicates that the oily water treatment system has sufficient capacity to accept and treat the additional stormwater runoff from the fifth train area (URS, 2010a). The Refinery's oily water treatment system includes storage tanks and reservoirs with a total storage capacity of about 15.4 million cubic feet. The 100-year stormwater runoff volume (42,890 cubic feet) is about 0.28% of the total storage capacity in Refinery's oily water treatment system (URS, 2010a). Based on the Will Serve letter and storage volume available, Energy Commission staff concluded that the Refinery's oily water treatment system would have adequate capacity to handle runoff from the fifth train power block at the BP Watson project.

Energy Commission staff also reviewed Watson's conceptual BMPs for hazardous materials management to limit potentially significant water quality impacts. Secondary containment structures would be built around the oil-filled equipment to prevent dispersion in case of a spill. Hazardous materials would be stored at the existing Watson Cogeneration facility in storage areas equipped with curbs or containment dikes to contain spills or leaks. Solid wastes and small amounts of hazardous waste that are generated at the BP Watson project would be properly accounted for, tracked, handled, and disposed of off-site using licensed transporters and disposal facilities. Based on the proposed BMPs for hazardous materials management, Energy Commission staff concluded that the BP Watson project would not result in significant water quality impacts related to a release of hazardous materials.

Soil & Water Table 4
Predevelopment and Post-Development Stormwater Runoff

Site Condition	Area (ac)	Q10 Discharge (cfs)	Q100 Discharge (cfs)	Q10 Volume (ft^3)	Q100 Volume (ft^3)
Pre-development					
Discharge to Storm Drain System	21.7	68.6	105.8	319,650	500,070
Discharge to Oily Water System	0.0	0.0	0.0	0	0
Total	21.7	68.6	105.8	319,650	500,070
Post-development					
Discharge to Storm Drain System	19.9	64.5	99.2	299,500	467,140
Discharge to Oily Water System	1.8	5.9	9.1	27,500	42,890
Total	21.7	70.4	108.3	327,000	510,030

(URS, 2010a)

Energy Commission staff also reviewed Watson's proposed water quality treatment plans to determine if the proposed plans would meet the standards set forth in the Los Angeles County's Municipal Stormwater NPDES Permit (MS4 Permit). The BP Watson project includes about 0.7 acres of development that would route stormwater to the existing Watson Cogeneration facility's storm drain system with discharge to the Dominguez Channel. Currently, the existing Watson Cogeneration facility incorporates a visual inspection program prior to discharge into the Dominguez Channel. There is a valve upstream of the storm drain outfall that remains closed during dry weather. During storm conditions, personnel from the existing Watson Cogeneration facility inspect the accumulated water in the storm drain. If the water appears clean and clear, the valve is opened and storm water is discharged to the Dominguez Channel. If the water quality is questionable, a vacuum truck is used to remove the water from the sewer box until it is running clear.

Energy Commission staff obtained analysis results for water quality samples collected from the existing Watson Cogeneration facility's storm drain outfall from the Los Angeles RWQCB. The sample analysis results from January, April and November 2007, and January 2008 indicate that stormwater discharged from the existing Watson Cogeneration facility had levels of metals (chromium, lead, and zinc) above California MCLs, low level detections of several polynuclear aromatic hydrocarbons (PAHs), and elevated levels of fecal coliform and e-coli (BP Carson, 2007 and 2008). All samples contained levels of zinc (1.3 to 3.9 mg/l) above the U.S. EPA Benchmark Value for stormwater (0.117 mg/l). Two of the four samples contained levels of copper (0.09 to

0.093 mg/l) above the stormwater benchmark (0.0636 mg/l). One sample contained pyrene at 0.0068 mg/l, just below the benchmark of 0.01 mg/l. The Dominguez Channel Estuary is listed as an impaired water body due to high levels of a number of contaminants including chromium, lead, zinc, and PAHs (RWQCB, 2009).

The MS4 Permit requires all new development and redevelopment projects to minimize the discharge of pollutants of concern. Development projects are required to include water quality treatment BMPs to treat stormwater the “maximum extent practicable” to limit discharge of pollutants of concern. The MS4 Permit includes a numerical design standard for post-construction treatment BMPs to treat stormwater runoff from the first ¾ inch of rainfall (or for a flow rate generated by a rainfall intensity of 0.2 inches per hour) prior to discharge to a receiving water (RWQCB, 2009).

The stormwater sample analysis results indicate pollutants of concern are currently being discharged from the existing Watson Cogeneration facility including several at or above the EPA stormwater benchmark values. Energy Commission staff is concerned that the proposed stormwater discharge approach at the existing Watson Cogeneration facility and the BP Watson project (visual inspection and discharge) does not meet the “maximum extent practicable” standard. The MS4 Permit identifies a clear numerical treatment standard for a treatment control BMP for stormwater prior to discharge to the Dominguez Channel. Without implementation of a treatment control BMP, the BP Watson project could lead to potentially significant adverse impacts to stormwater quality in the Dominguez Channel. As part of the development of the BP Watson project, Watson should install a treatment BMP to target suspended sediment, metals, hydrocarbons, and PAHs in stormwater runoff discharged from all areas redeveloped as part of the BP Watson project to comply with the MS4 Permit and to mitigate potentially significant adverse stormwater quality impacts.

The City of Carson has requested that Watson voluntarily implement water quality treatment BMPs that address the entire existing Watson Cogeneration facility (CEC, 2010f). The RWQCB is expected to adopt Total Maximum Daily Loads (TMDLs) for the Dominguez Channel within the next couple of years to address numerous pollutants of concern (CEC, 2010f). Once the TMDLs are adopted, the existing Watson Cogeneration facility and BP Carson Refinery will be required to install water quality treatment BMPs to address discharge of pollutants of concern under the Refinery’s Industrial Stormwater NPDES permit (CEC, 2010f). Given the impending requirement for treatment, Energy Commission staff recommends that Watson implement water quality treatment for the entire existing Watson Cogeneration facility as part of the BP Watson project.

Given the highly industrial nature of the project site including existing impacts to soils and groundwater, Energy Commission staff recommends that Watson consider use of subsurface media filtration system sized to treat the runoff from the combined BP Watson project and existing Watson Cogeneration facility site. Provided that an appropriately sized treatment BMP that meets the MS4 Permit requirements is implemented with the BP Watson project, Energy Commission staff believes that potentially significant stormwater quality impacts would be mitigated to a less than significant level.

Conditions of Certification **SOIL&WATER-1, -3,** and **-4** require the project owner to prepare plans for implementing, monitoring and maintaining BMPs appropriate for the operating phase in the form of a DESCP, SUSMP, and SWPPP for Industrial activity. The goal of the DESCP as required by the Energy Commission is to provide detailed storm drainage and erosion control plans and to identify and implement appropriate BMPs to limit stormwater and erosion related impacts. The goal of the Industrial SWPPP as required by the RWQCB is to identify potential sources of contaminants that could be present during project operations, assure adequate BMPs for preventing pollution of soil and water resources are incorporated into the project's final design and implemented. Condition of Certification **SOIL&WATER-3** requires Watson to prepare and submit for approval a SUSMP as required under Los Angeles County's MS4 Permit. The SUSMP would identify pollutants of concern and the means to minimize the discharge of these pollutants from the project site using numerically sized BMPs. Compliance with Conditions of Certifications **SOIL&WATER-2, -3, and -4** will ensure there are no significant impacts or conveyance of pollutants to soil and water resources down-gradient of the project site.

Surface Water Flooding

The BP Watson site is designated as a "C" flood zone for flood management indicating that the project site is outside of the designated 100-year floodplain and the potential for flooding is low (Watson, 2009a). As discussed above, the peak discharge to the Dominguez Channel from the existing Watson Cogeneration facility would decrease as a result of the BP Watson project for both the 10-year and 100-year storm events. The proposed project would not alter drainage patterns or increase flow rates in Dominguez Channel. Energy Commission staff believes that the operation of the BP Watson project would not adversely affect surface waters or increase flooding in the vicinity of the project site.

Project Operations Water Supply

Watson proposes to use reclaimed water as the primary source of water for operations. Energy Commission staff examined the proposed reclaimed water supply to determine if the water use would result in significant impacts to existing water supplies or users. In addition, the use of reclaimed water, particularly for evaporative cooling, could pose a public health hazard if not treated to adequate standards. Finally, use of reclaimed water could lead to potentially significant impacts if the reclaimed water was to cross contaminate existing potable supply lines.

The BP Watson project would use reclaimed water from WBMWD to provide steam and water supply to the BP Carson Refinery, cooling tower makeup, and CTG fogger supply. Watson estimates that about 3,015 afy of reclaimed RO and nitrified water would be required for the BP Watson project. A Will Serve letter indicates that the BP Carson Refinery will be able to provide sufficient reclaimed water for the BP Watson project. A Memorandum of Understanding between WBMWD and the BP Carson Refinery indicates that approximately 5,806 acre-feet per year of reclaimed water may be supplied to the BP Carson Refinery (URS, 2010b).

The reclaimed water supply will be available in two phases. First, nitrified water for the cooling towers for the existing Watson Cogeneration facility and the two additional towers proposed for the BP Watson project would be available beginning in December 2012. RO water for inlet evaporative cooling, HRSG supply, and steam supply for the BP Carson Refinery would be available by July 2013. Back up water supply would be provided by municipal supplies from the California Water Services Company augmented by groundwater pumped from wells at the BP Carson Refinery. The BP Watson project is scheduled to begin commercial operations in December 2012. During the “bridge” period between the beginning of commercial operations and the availability of RO supplies, the BP Watson project would rely on the municipal back up supply (URS, 2010a).

Staff considered potential impacts related to the use of municipal water and groundwater as a secondary backup water supply during the bridge period and during planned and unplanned outages. Overall, the total use of municipal water and groundwater will decrease as a result of the delivery of about 5,806 afy of reclaimed water. The BP Watson project is anticipated to require up to 3,015 afy. The total use of fresh water at the existing Watson Cogeneration facility is expected to decline by up to 2,791 afy. Staff anticipates that the bridge period would last up to eight months requiring up to 1,903 acre-feet of fresh water until the reclaimed RO water supply becomes available. Planned and unplanned disruptions to the reclaimed water supply are expected to be relatively short in duration and are not expected to result in a significant use of fresh water supplies.

The municipal water supply is comprised a mix of 70 to 80% surface water from the State Water Project and Colorado River and 20 to 30% local groundwater. The surface water deliveries are provided under water rights regulated by the State and Federal Government to balance the requirements for urban and agricultural uses while limiting ecological impacts. Use of municipal water at rates below those currently supplied to the existing Watson Cogeneration facility would not cause significant impacts to water supplies. Groundwater pumping in the Carson area, both by municipal suppliers and the BP Carson Refinery, is regulated under the 1940’s adjudication. Total groundwater pumping would decline significantly at the BP Carson Refinery reducing salt water intrusion within the West Coast Basin. Use of groundwater at rates below those currently use at the existing Watson Cogeneration facility both delivered via municipal supply or pumped at the BP Carson Refinery would not cause a significant impact to groundwater resources.

The proposed reclaimed water supply is wastewater treatment plant effluent from WBMWD’s Carson Regional Water Recycling Facility that has received tertiary treatment to Title 22 standards. This treatment plant discharges unused wastewater to the Dominguez Channel and on to the Pacific Ocean. Use of the proposed reclaimed supply would replace the use of municipal water and groundwater at BP Watson, the existing Watson Cogeneration facility, and at the BP Carson Refinery (URS, 2009b). This would decrease reliance on fresh water supplies provided by the Colorado River and State Water Project, reducing existing impacts related to these over-subscribed water supplies. Also, the proposed supply would decrease groundwater pumping at the BP Carson Refinery, limiting the Refinery’s contributions to local drawdown and sea water intrusion impacts to the aquifer. While the use of reclaimed water supply reduces reliance on fresh water sources, reclaimed water has numerous beneficial uses including for agricultural and landscape irrigation, industrial uses, and other non-potable purposes and reclaimed water should also be utilized as efficiently as possible.

The total proposed water supply for the BP Watson project would be significantly greater than for a combined cycle generating facility of a similar capacity that primarily generates electricity because the primary purpose for the project is to provide steam to the BP Carson Refinery. The average annual water demand for the BP Watson project would be approximately 3,015 acre-feet including approximately 2,855 afy of RO water and 160 afy of nitrified water. This annual water demand is about 35 afy/MW, which is significantly higher than atypical wet cooled, combined cycle power plant in California. However, about 2,480 afy of the total water supplied to the BP Watson project would be delivered to the BP Carson Refinery as steam and high pressure water supplies. Thus, about 82.3% of the total water supplied to the BP Watson project or about 86.9% of the RO water supplied to the Fifth Train would be delivered to the BP Carson Refinery in the form of steam and high pressure water. The net water supply for the BP Watson project, i.e. total water supply less the steam and water supplied to the BP Carson Refinery, would be about 535 afy or about 6.3 afy/MW, which is typical for wet cooled combined cycle power plants in California.

However, Watson revised water supply estimates in response to Data Request 48, indicating that total water supply to the BP Watson project and the existing Watson Cogeneration facility would be about 1,252 afy less than estimates in provided in the AFC because about 45% of the water supplied as to the HRSGs and BP Refinery is returned as condensate (URS, 2010a). Watson also indicated that the water balance provided in Table 5.5-9 would not be affected by that clarification (URS, 2010a). Staff cannot reconcile the revised Table 5.5-9 and the water balance provided in Table 5.5-4 (Watson, 2009a). The BP Watson project should revisit and possibly revise the water balance flow diagram provided in Figure 5.5-1 and the water balance provided in Table 5.5-4 to account for the returned condensate. Staff would like to update the water supply estimates and the delivery estimates to account for the returned condensate in the Final Staff Assessment [Refer to Comment 4.9.3].

~~To monitor water use, the BP Watson project is required to install and maintain metering devices as part of the water supply and distribution system to monitor the use of the primary and secondary sources of water supplied to the project for cooling water, domestic potable water, and other plant uses. Condition of Certification **SOIL&WATER-5** requires installation and monitoring of metering devices on all water supply lines at BP Watson. To limit the use of the municipal and groundwater secondary water supplies beyond the quantities evaluated in this Staff Assessment, Condition of Certification **SOIL&WATER-5** also requires the BP Watson project to obtain CPM approval for the use of secondary municipal and groundwater water supply during planned disruptions to the primary reclaimed water supply.~~[Refer to Comment 4.9.5]

In addition, to help demonstrate that the BP Watson project is efficiently utilizing the water supplied to the project, delivery of steam and high pressure water to BP Carson Refinery shall also be monitored with a goal of delivering a minimum of 86% of all RO water supplied to the Fifth Train to the BP Carson Refinery. This goal of 86%delivery, will ensure that the BP Watson project is efficiently utilizing the water supplied to the power plant in line with other wet cooled, combined cycle power plants in California.

Condition of Certification **SOIL&WATER-6** requires installation and monitoring of metering devices on the water supply ~~the reverse osmosis supply~~ lines to the Fifth Train and the steam and high-pressure water lines that deliver water to the BP Carson Refinery [Refer to Comment 4.9.6]. All metering devices should be operational for the life of the project. An annual summary of water use and delivery of steam and water to BP Carson Refinery shall be submitted to the Compliance Project Manager in the annual compliance report.

The use of disinfected tertiary treated recycled water produced from reclaimed wastewater could pose a public health hazard and must meet the California Code of Regulations, Title 22, Division 4 requirements for "unrestricted use." All recycled water pipelines, storage tanks, and ancillary facilities would be constructed in compliance with Titles 17 and 22.

Title 17 addresses the requirements for back flow prevention and cross connections. Dual plumbing would be required for plant water that may be supplied from either tertiary treated reclaimed water or municipal supplies. Use of tertiary treated reclaimed water could lead to significant adverse impacts to municipal water supplies if the reclaimed water cross-contaminates the municipal supply pipelines. To address the potential for impacts to municipal supplies, a dual plumbing plan shall be prepared in accordance with Title 17 requirements. The California Department of Public Health would also perform and inspection of the implementation of the dual plumbing to confirm that the project would not lead to cross contamination of municipal supplies. Condition of Certification **SOIL&WATER-7** requires Watson to receive approval from the California Department of Public Health for a dual plumbing plan for the use of tertiary treated recycled water at the BP Watson site.

Title 22 addresses public health and use restrictions related to using tertiary treated recycled water at the BP Watson site. Title 22 is intended to address the potential for public health impacts related the use of recycled water potentially contaminated by pathogens within the project's cooling towers. The WBMWD currently produces and distributes tertiary treated recycled water processed at the Carson Regional Water Recycling Facility under an existing Water Recycling Requirements permit from the Los Angeles RWQCB (URS, 2009e). The WBMWD will need to update two Engineer's Reports to expand the Carson Regional Water Recycling Facility to provide additional recycled water for the BP Watson project, one for the Carson Regional Water Recycling Facility and one for the BP Carson Refinery (URS, 2009e). Both Engineer's Reports will need to be reviewed and approved by the California Department of Public Health and the Los Angeles RWQCB as part of the design process for the expansion of the Carson Regional Water Recycling Facility. Condition of Certification **SOIL&WATER-7** requires Watson to submit documentation of the approval from California Department of Public Health and the Los Angeles RWQCB for the Engineer's Reports covering the use of recycled water at the BP Watson site including an updated Water Recycling Requirements permit.

Provided that the BP Watson project adheres to the standards for the use of tertiary treated recycled water, Energy Commission staff believes that there will be no significant impacts related to the project's use of reclaimed wastewater. In addition, the use of reclaimed wastewater will decrease the use of existing freshwater sources, providing a net benefit to the State's water supplies.

Project Wastewater

The wastewater generated by the BP Watson project during operations would include both industrial wastewater and stormwater runoff from the fifth train power block area. The primary source of wastewater would be the cooling tower blowdown. These wastewater streams would be directed to the BP Carson Refinery's oily water treatment system and ultimately discharged to Los Angeles County Sanitation District's wastewater treatment plant. Energy Commission staff evaluated the potential impact on the existing treatment system and reviewed the storage and treatment capacity of the existing system to handle the wastewater discharge from BP Watson.

The BP Watson project would increase the wastewater flow rate from the existing Watson Cogeneration facility (not including stormwater) by approximately 90 gpm on average from approximately 0.81 mgd to 0.94 mgd. Maximum wastewater discharge would increase by about 139 gpm from approximately 1.21 mgd to 1.41 mgd (Watson, 2009a).

The estimated 100-year, 24 hour peak stormwater discharge to the BP Carson Refinery's oily water treatment system from the BP Watson project is approximately 9.1 cfs or 4,100 gpm. The total volume generated by the 100-year event is estimated to be 42,900 cubic feet or 320,840 gallons.

The discharge limits for the BP Carson Refinery are set forth in the industrial waste discharge permit for the BP Carson Refinery. The oily water system can discharge 5,081,000 gallons per day on average. The enforceable limits of the permit are set for wet weather discharges for two periods during the day. The enforceable limits are 5,210 gpm between 10 a.m. and 2 a.m. and 10,000 gpm for 2 a.m. to 10 a.m. The 10,000 gpm is the maximum rate that may be discharged and is measured as the highest average for a five minute period.

The BP Carson Refinery has provided a letter to the Watson Cogeneration facility acknowledging that the oily water treatment system has sufficient capacity to accept the waste stream (including stormwater runoff) from the BP Watson project while meeting its permitted discharge requirements (URS, 2010b). The oily water system currently processes approximately 4,000 gpm on average and peaks at 8,000 gpm (URS, 2009b).

Watson provided information regarding the available storage capacity of the existing tanks, basins, and a reservoir associated with the oily water treatment system. The total storage capacity available is approximately 207.5 million gallons. Currently two basins and a reservoir are empty with a combined storage capacity of 92 million gallons. It is anticipated that these storage facilities would be utilized in the event of a large runoff event to temporarily store additional runoff and allow the oily water treatment system to operate within the permitted limits. The estimated additional volume generated by the 100-year storm from the BP Watson project is approximately 520,840 gallons (URS, 2010a).

Energy Commission staff believes that there would be sufficient on-site storage and treatment capacity within the BP Carson Refinery's existing oily water treatment system to handle the industrial wastewater and stormwater generated by the proposed project. Additionally, Energy Commission staff believes that the by meeting the requirements of the existing industrial waste discharge requirements set forth for the BP Carson Refinery, the impact of the proposed project on existing wastewater treatment systems and water quality downstream of the site would be less than significant.

CUMULATIVE IMPACTS AND MITIGATION

Cumulative impacts consist of impacts that may occur as a result of the proposed project in combination with impacts from other past, present and reasonably foreseeable future projects. Cumulative impacts can result from individually minor, but collectively significant actions taking place over time.

Surface Water / Stormwater

The BP Watson site is outside of the 100-year floodplain and stormwater runoff from the existing Watson Cogeneration facility would decrease as a result of the BP Watson project. In addition, the implementation of a water quality treatment BMP numerically sized to treat runoff from the existing Watson Cogeneration facility including the redeveloped portions that are part of the BP Watson project would improve water quality for stormwater discharged from the site. The BP Watson project is expected to decrease flood flows and improve water quality within the Dominguez Channel and no significant cumulative impacts to surface water resources are expected.

Groundwater

By replacing existing groundwater supply at the BP Carson Refinery with reclaimed water supply, groundwater pumping is expected to decline. This is expected to lessen existing drawdown impacts in the vicinity of the BP Watson site and help to limit sea water intrusion into the aquifer below the BP Watson site. No significant cumulative impacts related to groundwater quantity or quality are anticipated as a result of the BP Watson project.

Project Water Supply

The proposed use of reclaimed water for the BP Watson project will reduce the demands on fresh water supplies in the project area including both surface water diversions from the Colorado River and State Water Project and groundwater pumped at the project site and at municipal wells in the Carson area. By replacing existing fresh water demands with reclaimed water, surface water supplies from the Colorado River and State Water Project may be put to other beneficial uses. As a result of utilizing recycled water that is currently discharged to the Dominguez Channel and ultimately the Pacific Ocean, no significant cumulative impacts related to water supply are expected as a result of the BP Watson project.

Project Wastewater

Wastewater including cooling tower blowdown and stormwater from the Fifth Train power block with be routed to BP Carson Refinery's oily water treatment system and ultimately discharged to the Los Angeles County Sanitation District's wastewater treatment plant under an existing Industrial Wastewater Discharge Permit. While wastewater discharge would increase as a result of the BP Watson project, total discharge from the BP Carson Refinery's oily water treatment system will remain within the limitation set forth in the Refinery's Industrial Wastewater Discharge Permit. No significant cumulative impacts related to wastewater discharge are anticipated as a result of the BP Watson project.

PUBLIC AND AGENCY COMMENTS

Unnamed Public Comment – Data Response Workshop, October 14, 2009

During the October 2009 Data Response Workshop, a member of the public expressed concern about past water discharge violations at the existing Watson Cogeneration facility.

Energy Commission staff followed up with Watson in Data Requests 40 and 41 regarding any past violations for all water discharges (stormwater and wastewater) related to systems that the BP Watson project would utilize at the existing Watson Cogeneration facility or the BP Refinery (CEC, 2009ac). Watson responded by providing a detailed list of all violations related to the clean water system and oily-water system. Watson reported that there had been numerous NPDES permit exceedances for stormwater discharges between 2003 and 2008, although some of the noted exceedances were disputed (URS, 2010a). Additional stormwater related violations were administrative related to an inadequate SWPPP, missing sample analysis data, and late report filings (URS, 2010a). Related to industrial wastewater discharge, there was one substantive violation in April 2007 related to a leaking valve on Tank 95 (URS, 2010a).

Energy Commission staff reviewed the reported violations and stormwater discharge sample analysis results from the outfall at the existing Watson Cogeneration facility. Stormwater analysis results indicate that low levels of metals, PAHs, and coliforms have been detected in stormwater discharge from the existing facility. Energy Commission staff has required Watson to include water quality treatment BMPs for all stormwater streams that will be altered through the BP Watson project.

City of Carson – April 19, 2010

The City of Carson indicated that they would require a SUSMP including a water quality treatment BMP for the 0.7 acres of the BP Watson site that will discharge to the existing Watson Cogeneration facility's clean water system and stormwater outfall. The City also encouraged Watson to address water quality treatment for the entire existing Watson Cogeneration facility during the implementation of BP Watson. The City noted that the RWQCB would adopt TMDLs for the Dominguez Channel within the next couple of years, and Watson would need to provide water quality treatment to meet TMDLs (CEC, 2010f).

In response, Energy Commission staff has required Watson to develop a SUSMP and implement a water quality treatment BMP covering all stormwater discharged from BP Watson in Condition of Certification **SOIL&WATER-3**. in addition, Energy Commission staff is similarly encouraging Watson to address all stormwater runoff from the existing

Watson Cogeneration facility with water quality treatment BMPs to provide a comprehensive stormwater treatment plan for the site to address the upcoming TMDLs.

COMPLIANCE WITH LORS

The BP Watson project would comply with all applicable LORS associated with soil and water resources, including:

- The Clean Water Act through the authority granted to the State to enforce coverage under the NPDES by the Los Angeles Regional Water Quality Control Board through the requirements for the preparation and implementation of the SWPPPs, Drainage Erosion and Sedimentation Control Plan, and Standard Urban Stormwater Mitigation Plan;
- The Resource Conservation Recovery Act of 1976 by the proper handling and discharge of wastewater and potentially contaminated soils;
- The California Constitution, Article X, Section 2 by using reclaimed water for plant process water;
- The Porter-Cologne Water Quality Control Act by the use of reclaimed water and through the implementation of the DESCP and SWPPP;
- California Water Code 13550 by using reclaimed water for all plant process and cooling uses;
- The California Safe Drinking Water and Toxic Enforcement Act by establishing secondary containment in chemical storage areas;
- The Water Recycling Act by using reclaimed water for plant process and cooling uses;
- Title 17 of the California Code of Regulations by ensuring that the California Department of Public Health confirms the requirements of backflow prevention and cross connections of potable and non-potable lines;
- Title 22 of the California Code of Regulations by ensuring that the California Department of Public Health and Los Angeles Regional Water Quality Control Board review and approve the wastewater treatment system to ensure that the proposed systems meet tertiary treatment standards for the protection of public health;
- Title 23 of the California Code of Regulations requiring the Regional Board to specify conditions for protection of water quality as applicable: In the case of the BP Watson project, the project would be permitted under the General NPDES Permits for Discharge of Stormwater associated with both construction and industrial activity;
- The Energy Commission's 2003 Integrated Energy Policy Report, and SWRCB Resolutions 75-58, by using reclaimed wastewater for power plant cooling and process water demands.

CONCLUSIONS

Energy Commission staff has not identified any immitigable potentially significant impacts to Soil and Water Resources for the BP Watson project and believes that the BP Watson project would comply with all applicable Laws, Ordinances, Regulations and Standards (LORS) provided the proposed conditions of certification are implemented.

Energy Commission staff has identified the following issues that should be resolved prior to completion of the Final Staff Assessment:

- As currently proposed, the BP Watson project does not comply with the Los Angeles County Municipal Stormwater NPDES Permit and could result in potentially significant adverse impacts to water quality related to untreated stormwater that would be discharged from the site. The BP Watson project did not propose a numerically sized water quality Best Management Practices for stormwater discharge as required by the Los Angeles County Municipal Stormwater NPDES Permit (MS4 Permit). The BP Watson project should identify and implement an approach for water quality treatment BMP(s) to handle stormwater runoff for all portions of the existing Watson Cogeneration facility that will be modified through the development of the BP Watson project. Preferably, the water quality BMPs would address all runoff from the existing Watson Cogeneration facility to expand the project's benefits.
- The BP Watson project revised the estimates of water supply in the most recent Data Responses. However, Energy Commission staff could not reconcile the most recent estimates of water supply in Revised Table 5.5-9 and Table 5.5-4 in the AFC. The BP Watson project should consider revising the Water Balance presented in Table 5.5-4 to illustrate where the 45% of the steam to the HRSGs is returned to the system. Energy Commission staff is concerned that this returned steam is not accounted for in the 86% efficiency goal.

Energy Commission staff concludes the following:

- Implementation of Best Management Practices during the BP Watson project construction and operation in accordance with effective Storm Water Pollution Prevention Plans, a Drainage Erosion and Sediment Control Plan, and Standard Urban Stormwater Management Plan would avoid significant adverse effects that could otherwise result in significant transport of sediments or contaminants from the site by wind or water erosion.
- Use of reclaimed water for the BP Watson project water supply is consistent with Energy Commission water policy and will be beneficial to the State's fresh water supplies by decreasing the use of fresh water from the State Water Project and Colorado River.
- Use of reclaimed water for BP Watson project water supply will also benefit groundwater resources in the vicinity of the project site by reducing groundwater pumping, improving drawdown and helping to limit seawater intrusion.
- The project would not be located within the 100-year flood plain, and would not

increase flood conditions downstream of the project.

- The discharge of wastewater under the conditions stipulated in the BP Carson Refinery's Industrial Wastewater Discharge Permit would meet Los Angeles County Sanitation District's wastewater standards.

Where the potential for impacts has been identified, staff is proposing mitigation measures to reduce the impact to less than significant. Since impacts to soil and water resources would be mitigated to below significance levels, the project would not pose any adverse impacts to the previously noted minority population around the project site and the issue of environmental justice would not apply to the proposed project. The mitigation measures, as well as specifications for LORS conformance, are included as conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOIL&WATER-1: Prior to site mobilization, the project owner shall obtain CPM approval for a site-specific Drainage, Erosion and Sedimentation Control Plan (DESCP) that ensures protection of water quality and soil resources of the project site for both the construction and operational phases of the project. This plan shall address appropriate methods and actions, both temporary and permanent, for the protection of water quality and soil resources, demonstrate no increase in off-site flooding potential, meet local requirements (including MS4 Permit requirements), and identify all monitoring and maintenance activities. The plan shall be consistent with the grading and drainage plan as required by Condition of Certification **CIVIL-1** and may incorporate by reference any SWPPP developed in conjunction with any NPDES permit.

The DESCP shall contain elements one through nine below outlining site management activities and erosion- and sediment-control BMPs to be implemented during site mobilization, excavation, construction, and post construction (operating) activities.

1. **Vicinity Map** – A map(s) at a minimum scale 1"=100' shall be provided indicating the location of all project elements (construction site, laydown area, pipelines) with depictions of all significant geographic features including swales, storm drains, and sensitive areas.

2. **Site Delineation** – All areas subject to soil disturbance for the BP Watson project (project site, laydown and parking area, , and any other project elements) shall be delineated showing boundary lines of all construction areas and the location of all existing and proposed structures, pipelines, roads, and drainage facilities.

3. **Watercourses and Critical Areas** – The DESCP shall show the location of all nearby watercourses including swales, storm drains, and drainage ditches. It shall indicate the proximity of those features to the BP Watson site construction, laydown and parking areas.

4. **Drainage Map** – The DESCP shall provide a topographic site map(s) at a minimum scale of 1”=100’ showing existing, interim, and proposed drainage swales and drainage systems and drainage-area boundaries. On the map, spot elevations are required where relatively flat conditions exist. The spot elevations and contours shall be extended off site for a minimum distance of 100 feet.

5. **Narrative of Project Site Drainage** – The DESCP shall include a narrative of the drainage measures necessary to protect the site and potentially affected soil and water resources within the drainage downstream of the site. The narrative shall include the summary pages from the hydraulic analysis prepared by a professional engineer and erosion control specialist. The narrative shall state the watershed size(s) in acres that was used in the calculation of drainage features. The hydraulic analysis shall be used to support the selection of BMPs and structural controls to divert off-site and on-site drainage around or through the BP Watson site and laydown areas.

6. **Clearing and Grading Plans** – The DESCP shall provide a delineation of all areas to be cleared of vegetation and areas to be preserved. The plan shall provide elevations, slopes, locations, and extent of all proposed grading as shown by contours, cross sections, or other means. The locations of any disposal areas, fills, or other special features shall also be shown. Existing and proposed topography shall be illustrated by tying in proposed contours with existing topography.

7. **Clearing and Grading Narrative** – The DESCP shall include a table with the quantities of material excavated or filled for the site and all project elements (project site, laydown area, transmission and pipeline corridors, roadways, and bridges) whether such excavation or fill is temporary or permanent, and the amount of such material to be imported or exported.

8. **Best Management Practices Plan** – The DESCP shall identify on the topographic site map(s) the location of the site specific BMPs to be employed during each phase of construction (initial grading, project element excavation and construction, and final grading/stabilization). The DESCP shall identify an appropriate water quality treatment BMP to target sediment, metals, hydrocarbons, and PAHs numerically sized to meet the requirements of the LARWQCB.

9. **Best Management Practices Narrative** – The DESCP shall show the location (as identified in 8 above), timing, and maintenance schedule of all erosion- and sediment-control BMPs to be used prior to initial grading, during all project element (site, pipelines) excavations and construction, final grading/stabilization, and operation. Separate BMP implementation schedules shall be provided for each project element for each phase of construction. The maintenance schedule shall include post-construction maintenance of structural-control BMPs, or a statement provided about when such information will be available.

Verification: No later than 90 days prior to start of site mobilization, the project owner shall submit a copy of the DESCP for construction activity and operations to the City of Carson and the Los Angeles Regional Water Quality Control Board (LA RWQCB) for review and comment. No later than 60 days prior to start of site mobilization, the project owner shall submit the DESCP with the City's and LA RWQCB's comments to the CPM for review and approval. The CPM shall consider comments by the City and LA RWQCB before approval of the DESCP. The DESCP shall be consistent with the grading and drainage plan as required by condition of certification **CIVIL-1**, and relevant portions of the DESCP shall clearly show approval by the chief building official. During construction, the project owner shall provide an analysis in the monthly compliance report on the effectiveness of the drainage, erosion and sediment control measures and the results of monitoring and maintenance activities. Once operational, the project owner shall provide in the annual compliance report information on the results of monitoring and maintenance activities.

SOIL&WATER-2: The project owner shall comply with the requirements of the general National Pollutant Discharge Elimination System (NPDES) permit for discharge of stormwater associated with construction activity. The project owner shall develop and implement a construction stormwater pollution prevention plan (construction SWPPP) for the construction of the BP Watson site, laydown area, and all linear facilities.

Verification: The project owner shall submit to the compliance project manager (CPM) a copy of the construction SWPPP prior to site mobilization and retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the Los Angeles Regional Water Quality Control Board regarding the NPDES permit for the discharge of stormwater associated with construction activity within 10 days of its receipt or submittal. Copies of correspondence shall include the notice of intent sent to the State Water Resources Control Board, and the board's confirmation letter indicating receipt and acceptance of the notice of intent.

SOIL&WATER-3: The project owner shall submit to the CPM a copy of the Standard Urban Stormwater Mitigation Plan (SUSMP) as required under Los Angeles County's Municipal Stormwater NPDES Permit (MS4 Permit) prior to commencement of construction of the BP Watson project. The SUSMP shall identify and implement an appropriate water quality treatment Best Management Practice targeted to the pollutants of concern at the site and receiving water and sized according the numerical sizing guidelines included in the MS4 Permit.

Verification: The project owner shall submit to the compliance project manager (CPM) a copy of SUSMP prior to site mobilization. The project owner shall submit copies to the CPM of all correspondence between the project owner, the Los Angeles Regional Water Quality Control Board, and the City of Carson regarding the SUSMP for the discharge of stormwater from the Watson Cogeneration facility within 10 days of its receipt or submittal. Copies of correspondence shall include all comments on the SUSMP. The project owner shall revise the SUSMP to address all comments from the Los Angeles Regional Water Quality Control Board and the City of Carson and submit the final SUSMP for approval by the CPM prior to operation.

SOIL&WATER-4: The project owner shall comply with the requirements of the general NPDES permit for discharges of stormwater associated with industrial activity. The project owner shall develop and implement an industrial stormwater pollution prevention plan for the operation of the BP Watson project.

Verification: The project owner shall submit to the CPM a copy of the industrial SWPPP for operation of the BP Watson project prior to commercial operation, and shall retain a copy on site. The project owner shall submit copies to the CPM of all correspondence between the project owner and the LA RWQCB regarding the general NPDES permit for discharge of stormwater associated with industrial activity within 10 days of its receipt or submittal. Copies of correspondence shall include the Notice of Intent sent by the project owner to the State Water Resources Control Board.

~~**SOIL&WATER-5:** Primary water supply for cooling, process and other non-potable uses shall be disinfected tertiary treated reclaimed water supplied by West Basin Municipal Water District. Secondary water supply shall be municipal water supplied by California Water Services Company augmented by groundwater pumped from onsite wells. Secondary water supply shall only be utilized prior to the availability of reclaimed reverse osmosis water in July 2013. Following July 2013, the secondary water supply shall only be utilized in the event of a disruption in the primary reclaimed water supply. Following July 2013, the Project owner shall notify the CPM of any disruptions in the primary reclaimed water supply exceeding 24 hours. For any planned disruptions in the primary reclaimed water supply that will exceed 7 days, the Project owner shall obtain CPM approval on a water supply disruption plan that outlines the reasons and duration for the planned disruption, and the volume of secondary water that will be utilized during the planned disruption.~~

~~**OK – Previously requested by CEC staff and agreed to by Watson.** Prior to commercial operation of the Watson Cogeneration Steam and Electric Reliability Project (BP Watson), the Project owner shall install and maintain metering devices as part of the Project water supply and distribution system, to monitor and record in gallons per month the total volumes of water supplied to the Project from each water source (nitrified reclaimed water, reverse osmosis reclaimed water, municipal water, and groundwater). The metering devices shall be operational for the life of the project.~~

~~The Project owner shall prepare an Annual Water Use Summary, which will include the monthly range and monthly average of daily non-potable water usage in gallons per day, and total water used by the project on a monthly and annual basis in acre feet. Potable water use on-site shall be recorded on a monthly basis. For subsequent years, the Annual Water Use Summary shall also include the yearly range and yearly average water use by the project. The annual summary shall be submitted to the CPM as part of the annual compliance report.~~

~~**Verification:** At least 30 days prior to commercial operation of BP Watson, the Project owner shall submit documentation to the California Energy Commission (Energy Commission) Compliance Project Manager (CPM) that metering devices for the Project have been installed on each water source (nitrified reclaimed water, reverse osmosis~~

~~reclaimed water, municipal water, and groundwater).~~

~~At least 14 days prior to any planned disruptions in the primary reclaimed water supply, the Project owner shall provide a water supply disruption plan to the CPM for review and comment. The Project owner shall obtain CPM approval on the water supply disruption plan, prior to utilizing the secondary municipal/groundwater water supply for planned disruptions. The CPM shall verify that any planned disruptions are short in duration and do not result in an overall increase in total fresh water use at the Watson Cogeneration facility (including all five trains).~~

~~The Project owner shall submit the Water Use Summary to the CPM in the annual compliance report. The summary report shall distinguish between recorded water use of nitrified reclaimed water, reverse osmosis reclaimed water, municipal water, and groundwater. Included in the summary report of water use, the project owner shall submit copies of meter records from the West Basin Municipal Water District documenting the quantities of tertiary treated recycled water provided (in gallons per day) by the West Basin Carson Regional Facility. The Project owner shall provide a report on the servicing, testing, and calibration of the metering devices. The Project owner shall provide a discussion of any disruptions in the primary reclaimed water supply exceeding 24 hours including the cause of the disruption and all efforts to address the disruption.~~ [Refer to Comment 4.9.5]

SOIL&WATER-6: Prior to commercial operation, the Project owner shall install and maintain metering devices as part of the Project water supply and distribution system, to monitor and record in gallons per month the total volumes of ~~reverse osmosis~~ water supplied to the Fifth Train (Lines C, E, and F - AFC Figure 5.5-1, Water Balance Flow Diagram) and volumes of water supplied by the Fifth Train to Watson Cogeneration Company's steam header and high pressure water system (Lines L and M - AFC Figure 5.5-1, Water Balance Flow Diagram) [Refer to Comment 4.9.6]. The metering devices shall be operational for the life of the project. The Project owner shall attempt in good faith to ensure that no less than 86% of the total volume of water supplied to the Fifth Train shall be delivered to the Watson Cogeneration Company's steam header and/or high-pressure water system on an annual basis. This percentage is a voluntary, non-binding goal and the Project owner shall not be deemed out-of-compliance with this condition for failure to achieve this percentage, provided the Project owner: 1) installs and maintains the metering devices described above; 2) attempts in good faith to achieve the non-binding percentage goal described above; and 3) provides the information set forth in the verification below.

Verification: At least 30 days prior to commercial operation of the Project, the Project owner shall submit documentation to the California Energy Commission (Energy Commission) Compliance Project Manager (CPM) that metering devices for the Project have been installed on lines C, E, F, L, and M (AFC Figure 5.5-1, Water Balance Flow Diagram) and are operational. The Project owner shall prepare an annual water usage summary giving the monthly total and annual total of water delivered to the Fifth Train via lines C, E, F, and from the Fifth Train to the Watson Cogeneration Company's steam header and/or high-pressure water system. The summary shall also state the annual percentage of the volume of water supplied to the Fifth Train that is delivered to the

Watson Cogeneration Company's steam header and/or high-pressure water system. The percentage shall be computed as (L+M)/(C+E+F). The annual summary shall be included in the Annual Compliance Report. The annual summary shall be included in the Annual Compliance Report. To the extent that the reported percentage for any year falls below the 86% goal, the Project owner shall include in the summary a discussion of the reasons for failing to achieve the goal and any steps that it has taken or intends to take to improve the percentage.

SOIL&WATER-7: Prior to beginning any site mobilization activities, the Project owner shall submit a Dual Plumbing Plan for utilizing disinfected tertiary treated recycled water for plant process and cooling uses to the California Department of Public Health for review and comment and to the Chief Building Official (CBO) for review and approval. The Dual Plumbing Plan shall be prepared in accordance with Title 17 of the State Water Code. This Plan may be consolidated with the Engineer's Report for the Production, Distribution and Use of Recycled Water as specified in **SOIL&WATER-8**. The Project owner shall comply with any reporting and inspection requirements set forth by the California Department of Public Health to fulfill statutory requirements.

Verification: At least 30 days prior to the start of any site mobilization activities, the Project owner shall submit the Dual Plumbing Plan to the California Department of Public Health and the CBO. The Project owner shall submit copies to the CPM of all correspondence between the Project owner and the California Department of Public Health related to the Dual Plumbing Plan within 10 days of its receipt or submittal. Copies of correspondence shall include the California Department of Public Health approval of the Dual Plumbing Plan.

~~**SOIL&WATER-8:** Prior to beginning any site mobilization activities, the West Basin Municipal Water District shall submit an Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson to the California Department of Public Health and Los Angeles Regional Water Quality Control Board for review and approval. The Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson shall be prepared in accordance with Titles 17 and 22 of the California Code of Regulations, the Health and Safety Code, and the Water Code. The Project shall comply with any reporting and inspection requirements set forth by the California Department of Public Health and Los Angeles Regional Water Quality Control Board.~~

Verification: ~~At least 30 days prior to the start of any site mobilization activities, the West Basin Municipal Water District shall submit an updated Water Recycling Requirements permit from the Los Angeles Regional Water Quality Control Board and approval of the Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson from the California Department of Public Health to the CPM. The Project owner shall submit copies to the CPM of all correspondence between the Project owner and the California Department of Public Health and/or the Los Angeles Regional Water Quality Control Board related to the Water Recycling Requirements permit or the Engineer's Report for the Production, Distribution and Use of Recycled Water at BP Watson within 10 days of its receipt or submittal.~~[Refer to Comment 4.9.7]

REFERENCES

Adams 2009a – Adams Broadwell & Joseph & Cardozo/Tanya Gulesserian (tn 53118). Petition to Intervene by CURE, dated 9/2/09. Submitted to CEC/Docket Unit on 9/2/09.

Adams 2009b - Adams Broadwell & Joseph & Cardozo/Tanya Gulesserian (tn 53626). CURE Status Report #1, dated 10/8/09. Submitted to Docket Unit on 10/8/09.

Adams 2009c – Adams Broadwell & Joseph & Cardozo/Tanya Gulesserian (tn 54058). California Unions For Reliable Energy (CURE) Comments on Revised & Extended Schedule, dated 11/9/09. Submitted to CEC/Docket Unit on 11/10/09.

BP Carson 2007 – Stormwater Quality Sample Results for Cogen Outfall 1/30/2007, 4/20/2007, and 11/30/2007. Provided by RWQCB on 4/8/10.

BP Carson 2008 – Stormwater Quality Sample Results for Cogen Outfall 1/23/2008. Provided by RWQCB on 4/8/10.

CAISO 2009a – California ISO/J. Brown (tn 52914). Transition Cluster Phase I Interconnection Study, dated 7/28/09. Submitted to Docket Unit on 8/19/09.

Carson 2009a – City of Carson/M.Gipson (tn 53139). Comment Letter from the Public Regarding BP Watson, dated 9/3/09. Submitted to CEC/Docket Unit on 9/8/09.

Carson 2010a – City of Carson/Max Castillo (tn 55948). General Conditions of Approval, dated 3/11/10. Submitted to CEC/Docket Unit on 3/17/10.

Carson 2010b – City of Carson/Max Castillo (tn 56035). Email Regarding Whether Landscape is Required For Project Location, dated 3/24/10. Submitted to CEC/Docket Unit on 3/23/10.

Carson 2010c – California Energy Commission/Candace Hill (tn 56049). City of Carson Specific Conditions of Approval, dated 3/26/10. Submitted to CEC/Docket Unit on 3/26/10.

Carson 2004 – Natural Hazards Mitigation Plan (Working Draft) – Flooding Hazards in the City of Carson. Copyright M. Martinet, 2004.

CDFG 2010a – CDFG Agency (tn 54765). CDFG Agency Comments Regarding Request for Participation, dated 1/11/10. Submitted to CEC/Docket Unit on 1/11/10.

CEC 2009a – California Energy Commission/Eric Knight (tn 50969). Document Handling for the Application for Certification, dated 4/10/09. Submitted to CEC/Docket Unit on 4/10/09.

CEC 2009b – California Energy Commission/Eric Knight (tn 50973). Notice of Receipt of

Application for Certification, dated 4/10/09. Submitted to CEC/Docket Unit on 4/10/09.

CEC 2009c – California Energy Commission/Eric Knight (tn 50978). Request for Agency Participation in the Review of the Watson Cogeneration, dated 4/10/09. Submitted to CEC/Docket Unit on 4/10/09.

CEC 2009d – California Energy Commission/Matt Steenaken (tn 51076). Emergency Medical Service Response Time Telephone Conversation, dated 4/15/09. Submitted to CEC/Docket Unit on 4/15/09.

CEC 2009e – California Energy Commission/Melissa Jones (tn 51109). CEC Responses to Application for Confidential – Cultural Technical Resources, dated 4/16/09. Submitted to CEC/Docket Unit on 4/16/09.

CEC 2009f – California Energy Commission/Melissa Jones (tn 51110). CEC Responses to Application for Confidential – Paleontological Resources Technical Report, dated 4/16/09. Submitted to CEC/Docket Unit on 4/16/09.

CEC 2009g – California Energy Commission/Christine Hammond (tn 51144). Letter RE Watson Cogeneration Steam & Electric Reliability, dated 4/17/09. Submitted to CEC/Docket Unit on 4/17/09.

CEC 2009h – California Energy Commission/Melissa Jones (tn 51147). Data Adequacy Recommendation, dated 4/17/09. Submitted to CEC/Docket Unit on 4/17/09.

CEC 2009i – California Energy Commission/Melissa Jones (tn 52491). CEC Revised Data Adequacy Recommendation, dated 7/21/09. Submitted to CEC/Docket Unit on 7/21/09.

CEC 2009j – California Energy Commission/Karen Douglas (tn 52619). Memorandum – Hearing Office Assignment, dated 7/29/09. Submitted to CEC/Docket Unit on 7/30/09.

CEC 2009k – California Energy Commission/Eric Knight (tn 52640). Library Letter for Notice of Supplemental Information, dated 7/31/09. Submitted to CEC/Docket Unit on 7/31/09.

CEC 2009l – California Energy Commission/Eric Knight (tn 52641). Notice of Receipt of a Supplemental to Application for Certification, dated 7/31/09. Submitted to CEC/Docket Unit on 7/31/09.

CEC 2009m – California Energy Commission/Eric Knight (tn 52645). Letters Requesting for Agency participation in the Review of BP Watson, dated 7/31/09. Submitted to CEC/Docket Unit on 7/31/09.

CEC 2009n – California Energy Commission/Melissa Jones (tn 52683). CEC Response to Application for Confidentiality RE Emission Reduction Credits, dated 7/31/09. Submitted to CEC/Docket Unit on 8/3/09.

CEC 2009o – California Energy Commission/RoseMary Avalos (tn 52686). Notice of Informational Hearing and Site Visit, dated 8/4/09. Submitted to CEC/Docket Unit on 8/4/09.

CEC 2009p – California Energy Commission/Alan Solomon (tn 52917). Issues Identification Report, dated 8/20/09. Submitted to CEC/Docket U nit on 8/20/09.

CEC 2009q – California Energy Commission/Alan Solomon (tn 53086). Data Request set 1 (1-39), dated 8/28/09. Submitted to CEC/Docket Unit on 9/1/09.

CEC 2009r – California Energy Commission/Melissa Jones (tn 53089). Elected Official Letter to Jenny Oropeza, dated 8/28/09. Submitted to CEC/Docket Unit on 9/1/09.

CEC 2009s– California Energy Commission/Melissa Jones (tn 53090). Elected Official Letter to Warren T. Furutani, dated 8/28/09. Submitted to CEC/Docket Unit on 9/1/09.

CEC 2009t– California Energy Commission/Melissa Jones (tn 53091). Elected Official Letter to Don Knabe, dated 8/28/09. Submitted to CEC/Docket Unit on 9/1/09.

CEC 2009u– California Energy Commission/Melissa Jones (tn 53092). Elected Official Letter to Jim Dear, dated 8/28/09. Submitted to CEC/Docket Unit on 9/1/09.

CEC 2009v – California Energy Commission/Karen Douglas (tn 53253). Committee Scheduling Order, dated 9/17/09. Submitted to CEC/Docket Unit on 9/17/09.

CEC 2009w – California Energy Commission/J. Byron (tn 53340). Committee Order Granting Petition to Intervene, dated 9/23/09. Submitted to CEC/Docket Unit on 9/23/09.

CEC 2009x – California Energy Commission/Terry O'Brien (tn 53451). Notice of Energy Commission Staff Data Response & Issues Resolution Workshop, dated 9/28/09. Submitted to CEC/Docket Unit on 9/29/09.

CEC 2009y– California Energy Commission/Alan Solomon (tn 53530). CEC Status Report #1, dated 10/1/09. Submitted to CEC/Docket Unit on 10/5/09.

CEC 2009z– California Energy Commission/Kevin Le (tn 53545). CEC Informational Hearing and Site Visit Presentation, dated 9/3/09. Submitted to CEC/Docket Unit on 10/5/09.

CEC 2009aa – California Energy Commission/Maggie Read (tn 53969). Tentative Revised Schedule, dated 11/2/09. Submitted to CEC/Docket Unit on 11/3/09.

CEC 2009ab – California Energy Commission/Christine Hammond (tn 54032). Staff Comments on Proposed Revised Schedule, dated 11/9/090. Submitted to CEC/Docket Unit on 11/10/09.

CEC 2009ac – California Energy Commission/Alan Solomon (tn 54390). CEC Data Request Set 2, dated 12/10/09. Submitted to CEC/Docket Unit on 12/10/09.

CEC 2009ad – California Energy Commission/Karen Douglas (tn 54421). Revised Committee Scheduling Order, dated 12/14/09. Submitted to CEC/Docket Unit on 12/14/09.

CEC 2009ae – California Energy Commission/Alan Solomon (tn 54469). Report of Conversation Data Request Set #2 Clarification, dated 12/14/09. Submitted to CEC/Docket Unit on 12/15/09.

CEC 2009af – California Energy Commission/Terry O'Brien (tn 54605). Notice of Energy Commission Staff Data Response & Issue Resolution Workshop, dated 12/29/09. Submitted to CEC/Docket Unit on 12/29/09.

CEC 2010a – California Energy Commission/R. Avalos (tn 55054). Letter Regarding Newly Revised POS List, dated 1/27/10. Submitted to CEC/Docket Unit on 1/27/10.

CEC 2010b – California Energy Commission/Alan Solomon (tn 55066). CEC Status Report #2, dated 1/28/10. Submitted to CEC/Docket Unit on 1/28/10.

CEC 2010c – California Energy Commission/Alan Solomon (tn 55712). CEC Status Report #3, dated 3/1/10. Submitted to CEC/Docket Unit on 3/1/10.

CEC 2010d – California Energy Commission/Mark Lindley (tn 55949). ROC Water Metering and Delivery Condition of Certification, dated 3/16/10. Submitted to CEC/Docket Unit on 3/17/10.

CEC 2010e – California Energy Commission/Alan Solomon (tn 56007). ROC Clarification of City of Carson General Conditions, dated 3/22/10. Submitted to CEC/Docket Unit on 3/22/10.

CEC 2010f – California Energy Commission/Mark Lindley (tn 56340). ROC with City of Carson re Stormwater Requirements, dated 4/19/10. Submitted to CEC/Docket Unit on 4/21/10.

CEC2010g – California Energy Commission/Maggie Read (tn 56319). Notice of Opportunity to File Statements of Concern re Eileen Allen, dated 4/20/10. Submitted to CEC/Docket Unit on 4/20/10.

CEC 2010h – California Energy Commission/Alan Solomon (tn 56488). CEC Status Report #4, dated 4/30/10. Submitted to CEC/Docket Unit on 4/30/10.

CEC 2010i – California Energy Commission/Alan Solomon (tn 56886). CEC Status Report #5, dated 5/28/10. Submitted to CEC/Docket Unit on 5/28/10.

CIMIS 2009 – California Irrigation Management Information System. Average Monthly ETo. http://wwwcimis.water.ca.gov/cimis/monthlyEToReport.do. website accessed February 4, 2010.

County 2009a – County Sanitation District/L. Shadler (tn 52965). County of Sanitation District of LA County Letter to CEC, dated 7/13/09. Submitted to CEC/Docket Unit on 8/25/09.

County LA 2009a – County of LA/F.Vidales (tn 54245). County of Los Angeles's Comments Regarding Request for Agency Participation, dated 11/10/09. Submitted to CEC/Docket Unit on 11/25/09.

DWR 2003 – California Department of Water Resources. California's Groundwater Bulletin 118. October 2003.

Ellison 2009a – Ellison, Schneider & Harris/J.Harris (tn 52298). Application for Confidential Designation – Emission Reduction Credits, dated 6/29/09. Submitted to CEC/Docket Unit on 7/1/09.

Ellison 2009b – Ellison, Schneider & Harris/G. Wheatland (tn 53288). Objections to Certain Commission Staff Data Requests Set 1 & Notice of Need for Additional Time to Respond, dated 9/21/09. Submitted to CEC/Docket Unit on 9/21/09.

Ellison 2009c - Ellison, Schneider & Harris/K. Mitchell (tn 53529). Air Quality Data Response #4 Status Report #1. Submitted to CEC/Docket Unit on 10/1/09.

Ellison 2009d - Ellison, Schneider & Harris/C. Ellison (tn 53623). Applicant's Status Report #1, dated 10/8/09. Submitted to CEC/Docket Unit on 10/8/09.

Ellison 2009e – Ellison, Schneider & Harris/C. Ellison (tn 54057). Applicant's Comments on Schedule, dated 11/10/09. Submitted to CEC/Docket Unit on 11/10/09.

Ellison 2010a – Ellison, Schneider & Harris/C. Ellison (tn 54645). Applicant's Objection to Certain Commission Staff Data Request Set 2, dated 1/28/10. Submitted to CEC/Docket Unit on 1/28/10.

Ellison 2010b – Ellison, Schneider & Harris LLP (tn 55084). Application Status Report NO. 2 for the Watson Cogeneration Project, dated 1/28/10. Submitted to CEC/Docket Unit on 1/28/10.

Ellison 2010c– Ellison, Schneider & Harris LLP (tn 55726). Application Status Report NO. 3 for the Watson Cogeneration Project, dated 3/1/10. Submitted to CEC/Docket Unit on 3/2/10.

RWQCB, 2009 – Los Angeles County Municipal Storm Water National Pollutant Discharge Elimination System (NPDES) Permit as Amended by Regional Board Order R4-2009-130. dated 12/10/09.

URS 2009a – URS Corp/Cindy Kyle-Fischer (tn 52344). Socioeconomics Clarification E-mail, dated 7/7/09. Submitted to CEC/Docket Unit on 7/8/09.

URS 2009b – URS Corp/ Cindy Kyle-Fischer (tn 53444). Applicant's Data Responses to CEC Data Request (1-39), dated 9/25/09. Submitted to CEC/Docket Unit on 9/28/09.

URS 2009c– URS Corp/ Cindy Kyle-Fischer (tn 53446). Public Health Modeling Files – Data Responses Appendix B-1, dated 9/25/09. Submitted to CEC/Docket Unit on 9/28/09.

URS 2009d – URS Corp/Cindy Kyle-Fischer (tn 53460). Answers to Socio Questions, dated 9/30/09. Submitted to CEC/Docket Unit on 9/30/09.

URS 2009e – URS Corp/Cindy Kyle-Fischer (tn 53800). Remainder of Applicant's Data Request Responses (1-39), dated 10/23/09. Submitted to CEC/Docket Unit on 10/26/09.

URS 2009f – URS Corp/Cindy Kyle-Fischer (tn 53971). Air Quality Data Response #4 Status Report #2, dated 11/2/09. Submitted to CEC/Docket Unit on 11/2/09.

URS 2009g – URS Corp/Cindy Kyle-Fischer (tn 54193). Letter of Response to South Coast Air Quality Management District Questions, dated 11/18/09. Submitted to CEC/Docket Unit on 11/19/09.

URS 2009h – URS Corp/Cindy Kyle-Fischer (tn 54340). Applicant's Response to CEC Data Request #4 Status Report 3, dated 12/1/09. Submitted to CEC/Docket Unit on 12/1/09.

URS 2009i – URS Corp/Cindy Kyle-Fischer (tn 54636). Applicant's Data Response – Status Report #4, dated 12/30/09. Submitted to CEC/Docket Unit on 12/30/09.

URS 2010a – URS Corp/Cindy Kyle-Fischer (tn 54708). Applicant's Response to CEC Data Request Set 1 And Set 2, dated 1/6/10. Submitted to CEC/Docket Unit on 1/7/10.

URS 2010b – URS Corp/Cindy Kyle-Fischer (tn 55189). Applicant's Response to CEC Data Request #4 Status Report 5, dated 2/1/10. Submitted to CEC/Docket Unit on 2/4/10.

URS 2010c– URS Corp/Cindy Kyle-Fischer (tn 55692). Applicant's Response to Questions from the January 20, 2010 Issues Resolution Workshop, dated 2/25/10. Submitted to CEC/Docket Unit on 2/25/10.

URS 2010d– URS Corp/Cindy Kyle-Fischer (tn 55756). Applicant's Response to CEC Data Request #4 Status Report 6, dated 3/1/10. Submitted to CEC/Docket Unit on 3/4/10.

URS 2010e– URS Corp/Cindy Kyle-Fischer (tn 55801). Aqueous Ammonia Off-Site

Consequence Analysis, dated 3/4/10. Submitted to CEC/Docket Unit on 3/9/10.

URS 2010f– URS Corp/Cindy Kyle-Fischer (tn 55803). Application for Change for Condition to Watson 1-4, dated 3/2/10. Submitted to CEC/Docket Unit on 3/9/10.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009b – Watson Cogeneration Company/Thomas A. Lu (tn 50585). Air Quality DVD and INPUT/OUTPUT Modeling Files, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009c – Watson Cogeneration Company/Thomas A. Lu (tn 50627). Application for Confidential - Paleontological Resources Technical Report, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009d – Watson Cogeneration Company/Thomas A. Lu (tn 50628). Application for Confidential – Cultural Technical Resources, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009e – Watson Cogeneration Company/Thomas A. Lu (tn 52187). Supplement in Response to CEC Data Adequacy Review, dated 6/29/09. Submitted to CEC/Docket Unit on 6/29/09.

WRCC 2010 – Western Regional Climate Center. Climate of California. http://www.wrcc.dri.edu/narratives/CALIFORNIA.htm. website accessed February 10, 2010.

TRAFFIC AND TRANSPORTATION

Scott Debauche

SUMMARY OF CONCLUSIONS

California Energy Commission (Energy Commission) staff has analyzed the traffic-related information provided in the Application for Certification and other sources to determine the potential for the Watson Cogeneration Steam and Electric Reliability Project to have adverse traffic- and transportation-related impacts. Staff has also assessed the availability of mitigation measures that could reduce or eliminate the significance of these impacts. Staff concludes that the proposed project would not result in significant adverse direct or indirect traffic or transportation impacts.

The proposed project is the expansion of the existing steam and electrical generating (cogeneration) Watson Cogeneration Facility (Facility) that is located in the city of Carson. Construction of the proposed project will add traffic to local roadways during the construction period. However, this short-term increase in traffic would not impact existing traffic load and capacity of the street system. Construction activities could result in damage to public roadways and introduce oversize and overweight vehicles on the local street system. Once the project is operational, no traffic would be generated and no impact would occur to the local transportation network. If the Energy Commission elects to grant certification for this project, staff is proposing four conditions of certification. These conditions of certification are recommended to prevent significant adverse traffic and transportation-related impacts from project construction and to ensure that the project would comply with all applicable laws, ordinances, regulations, and standards pertaining to traffic and transportation. Energy Commission staff concludes that with implementation of proposed Conditions of Certification **TRANS-1** through **TRANS-3**, the proposed project would not generate a significant impact under the California Environmental Quality Act guidelines with respect to California Environmental Quality Act Appendix G issues, “Transportation and Traffic.”

INTRODUCTION

In the **Traffic and Transportation** section, staff addresses the extent to which the proposed project may affect the traffic and transportation system within the vicinity of the project site. This analysis focuses on whether construction and operation of the proposed project would cause traffic and transportation impact(s) under California Environmental Quality Act (CEQA) and whether the project complies with the applicable laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 1 provides a general description of adopted federal, state, and local LORS pertaining to traffic and transportation relevant to the proposed project.

Traffic and Transportation Table 1
Laws, Ordinances, Regulations, and Standards

Applicable Law	Description
Federal	
Aeronautics and Space Title 14 Code of Federal Regulations (CFR), part 77 Objects Affecting Navigable Airspace (14 CFR 77)	Establishes standards for determining physical obstructions to navigable airspace; sets noticing and hearing requirements; and provides for aeronautical studies to determine the effect of physical obstructions on the safe and efficient use of airspace.
49 CFR, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (including hazardous materials program procedures) and provides safety measures for motor carriers and motor vehicles that operate on public highways.
State	
California Vehicle Code (CVC), division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
California Street and Highway Code §§117, 660-711	Requires permits from California Department of Transportation (Caltrans) for any roadway encroachment during truck transportation and delivery.
California Street and Highway Code §§660-711	Requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.
Local	
Metropolitan Transportation Authority 2004 Los Angeles County Congestion Management Plan	Designates that a minimum levels of service (LOS) E performance measurement is designated for highway segments and key roadway intersections in the CMP system.
City of Carson General Plan – Transportation and Infrastructure Element	Policy TI-2.1: Require that new projects not cause the Level of Service for intersections to drop more than one level if it is at Level A, B or C, and not drop at all if it is at D or below, except when necessary to achieve substantial City development goals.

SETTING

The project will complete the original design of the Facility that has been in continuous operation for more than 20 years. The project will add a nominal 85 megawatt (MW) via a combustion turbine generator (CTG) with a single-pressure heat recovery steam generator (HRSG) to provide additional process steam to the BP Refinery. The street address of the project site is located within the boundary of the existing facility at 22850 South Wilmington Avenue, Carson, California, located approximately 0.7 mile south of the I-405 Freeway, roughly bounded by Wilmington Avenue to the west, East Sepulveda Boulevard to the south, and South Alameda Street to the east. The proposed Facility will not require any off-site utility service facilities, with all electrical transmission, natural gas, and water connections required for the project occurring on-site (Watson 2009a, pp. 3-1 through 3-3). **Traffic and Transportation Figure 1** shows the local roadway system.

CRITICAL ROADS AND FREEWAYS

The transportation network within the project area consists primarily of city arterials, collectors, local roadways, and state-maintained freeways. The following describes the main regional and local roadways that would be used for construction and operational related traffic accessing the proposed project site.

Existing Regional and Local Transportation Facilities

I-405 Freeway

Interstate 405 (I-405) is a major north-south freeway within the BP Watson vicinity, that runs through Los Angeles and Orange Counties and extends from northern Los Angeles County toward south Orange County where it merges with I-5. The I-405 Freeway provides four general purpose and one high-occupancy vehicle mainline lanes in each direction with wide shoulders and a center median. In the vicinity of the project site, the I-405 Freeway has separate acceleration/ deceleration lanes at the interchange of the I-405 Freeway/South Alameda Street and I-405 Freeway/Wilmington Avenue (Watson 2009a, p. 5.11-2). The posted speed limit is 70 miles per hour (mph) (Watson 2009a, p. 5.11-2). The average daily traffic (ADT) on the I-405 Freeway in the vicinity of the project site is 294,000 vehicles per day with 6% being truck traffic (Watson 2009a, p. 5.11-2).

Alameda Street

Alameda Street is a major north-south arterial that is located east of the project site and is one of the primary access routes to the site. The roadway provides three traffic lanes in each direction and has a posted speed limit of 45 mph in the vicinity of the project site (Watson 2009a, p. 5.11-2). The ADT on Alameda Street just south of the I-405 Freeway is 23,175 vehicles per day (Watson 2009a, p. 5.11-2).

Wilmington Avenue

Wilmington Avenue is a north-south four-lane primary road to the west of the project site starting at Lomita Street to the south and ending at Firestone Boulevard (State Route 42) to the north. In the project area, this roadway has four through lanes (two in each direction) with 6-feet of shoulder on the east side (Watson 2009a, p. 5.11-2). Currently, the segment of Wilmington Avenue near the project site carries a high percentage of heavy truck traffic (Watson 2009a, p. 5.11-2). In the vicinity of the project site, the intersection of Wilmington Avenue and the BP Carson Refinery access road is unsignalized, with stop signs on the access road and a posted speed limit of 40 mph (Watson 2009a, p. 5.11-3).

Sepulveda Boulevard

Sepulveda Boulevard is a four-lane, east-west local roadway located south of the project site, starting at Prospect Avenue on the west and ending at the Terminal Island Freeway (103) on the east, where it changes name to Willow Street. In the vicinity of the project site, the intersection of Sepulveda Boulevard and Wilmington Avenue is controlled by a traffic signal and has a posted speed limit of 40 mph (Watson 2009a, p. 5.11-3).

East 223rd Street

East 223rd Street is a four-lane, east-west local roadway located north of the project site starting at Plaza Del Amo on the west and ending near Santa Fe Avenue to the east, where its name changes to Wardlow Road. In the vicinity of the project site the intersection of 223rd Street and Wilmington Avenue is controlled by a traffic signal and has a posted speed limit of 45 mph (Watson 2009a, p. 5.11-3).

Current Roadway Conditions

The roadways discussion below is based on information contained in the AFC as well as traffic data from Caltrans.

Level of Service

To quantify the existing baseline traffic conditions, the study area roadways and intersections were analyzed in the AFC to determine their operating conditions. Based on the traffic volumes, the turning movement counts, and the existing number of lanes at each intersection, the volume/capacity (V/C) ratios and levels of service (LOS) have been determined for each intersection.

LOS is a qualitative measure describing operational conditions within a traffic stream. It is used to describe and quantify the congestion level on a particular roadway or intersection and generally describes these conditions in terms of such factors as speed or vehicle movement. **Traffic and Transportation Table 2** summarizes roadway LOS for associated V/C ratios.

Traffic and Transportation Table 2
Level of Service Criteria for Roadways and Intersections

Level of Service	Volume/Capacity	Description
A	0.00 – 0.60	Free flow; insignificant delays
B	0.61 – 0.70	Stable operation; minimal delays
C	0.71 – 0.80	Stable operation; acceptable delays
D	0.81 – 0.90	Approaching unstable flow; queues develop rapidly but no excessive delays
E	0.91 – 1.00	Unstable operation; significant delays
F	> 1.00	Forced flow; jammed conditions

Source: Watson 2009a, p. 5.11-5

Current Roadway Segment Conditions — LOS

Traffic and Transportation Table 3 summarizes the existing morning (7:00 a.m. to 9:00 a.m.) and afternoon (4:00 p.m. to 6:00 pm) peak hour LOS for roadway segments located within the proposed project area that could be impacted by proposed project construction and operational related traffic. As shown in **Table 3**, all study area roadway segments under presented existing conditions operate at LOS C or better, with the exception of the I-405 Freeway between Alameda Street and Wilmington Avenue with one direction operating at LOS D during the morning peak hour.

Traffic and Transportation Table 3
Existing (2008) Roadway Segment Level of Service Summary

Roadway	Segment	AM Peak Hour		PM Peak Hour	
		V/C Ratio	LOS	V/C Ratio	LOS
I-405 Freeway (NB/SB)	Between Alameda St. and Wilmington Ave.	30.4/32.2[1]	D/D	31.3/25.4[1]	D/C
East 223rd St. (NB/SB)	Between Alameda St. and Wilmington Ave.	0.41/0.32	A/A	0.80/0.44	C/A
Alameda Ave. (EB/WB)	Between East 223rd St. and East Sepulveda Blvd.	0.34/0.32	A/A	0.58/0.38	A/A
Wilmington Ave. (EB/WB)	Between East 223rd St. and East Sepulveda Blvd.	0.49/0.43	A/A	0.48/0.56	A/A
East Sepulveda Blvd. (NB/SB)	Between Alameda St. and Wilmington Ave.	0.40/0.44	A/A	0.46/0.41	A/A

Source: Watson 2009a, pp. 5.11-6 and 5.11-7
Notes: NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound. [1]Shown in Density (vehicle/mile/lane).

Current Intersection Conditions — LOS

Traffic and Transportation Table 4 summarizes the existing morning and afternoon peak hour LOS for intersections located within the proposed project area that could be impacted by proposed project construction and operational related traffic. As shown in **Traffic and Transportation Table 3**, all study area intersections under presented existing conditions operate at LOS C or better, with the exception of the 223rd Street and Wilmington Avenue intersection, which operates at LOS E during the afternoon peak hour.

Traffic and Transportation Table 4
Existing (2008) Intersection Level of Service Summary

Intersection	Control	AM Peak Hour		PM Peak Hour	
		V/C Ratio	LOS	V/C Ratio	LOS
223rd St/I-405 Freeway SB on/off ramps	Signalized	0.47	A	0.49	A
223rd St./Wilmington Ave.	Signalized	0.75	C	0.97	E
Wilmington Ave./Sepulveda Blvd.	Signalized	0.69	B	0.63	B
Sepulveda Blvd./Alameda St. ramp	Signalized	0.60	A	0.56	A
Alameda St./Sepulveda Blvd. ramp	Signalized	0.51	A	0.54	A
Alameda St./223rd St. connector	Signalized	0.46	A	0.59	A
Alameda St./I-405 Freeway NB ramp	Signalized	0.55	A	0.67	B

Source: Watson 2009a, pp. 5.11-4 and 5.11-7
Notes: NB – Northbound; SB – Southbound

RAILWAYS

The nearest rail lines serving the proposed site crosses East 223rd Street at a distance of approximately 500-feet west of the Wilmington Avenue/East 223rd Street intersection, approximately 1,100-feet north of the project site (Watson 2009a, p. 5.11-3). This rail line is considered part of the Alameda Corridor, which is a key railroad facility for goods movement in Southern California (Watson 2009a, p. 5.11-3).

BUS TRANSPORTATION

The nearest transit bus service to the project site are Los Angeles County Metro Bus Route 205 serving Alameda Street to the east of the project site, and city of Carson Circuit Route F serving Wilmington Avenue and 223rd Street to the west and northwest of the project site (Watson 2009a, p. 5.11-3). These bus lines are located approximately 1,500-feet east and 1,800 feet west of the project site (Watson 2009a, p. 5.11-3).

BICYCLES AND PEDESTRIANS

Sidewalks (usually six feet wide) are generally present on one or both sides on all local roadways serving the proposed project site (Alameda Street, 223rd Street, Wilmington Avenue, and Sepulveda Boulevard) (Watson 2009a, p. 5.11-3). Field observations near the project site revealed light pedestrian activities in the vicinity of the site (Watson 2009a, p. 5.11-3). No designated bicycle routes exist within the immediate vicinity of the project site and adjacent project area (Watson 2009a, p. 5.11-3).

AIRPORTS

The nearest airport to the proposed project site is Zamperini Field Airport, located approximately 3.8 miles southwest of the site. Zamperini Field Airport is a public airport containing two parallel runways serving mostly general aviation activities (AirNav 2010a). For the one-year time frame ending May 31, 2005 (most recently published statistic), Zamperini Field Airport handled an average of 474 aircraft per day, of which 55% was transient general aviation and 44% local general aviation (AirNav 2010a).

Additionally, the proposed project is located approximately 3.9 miles west of Long Beach International Airport. Long Beach International Airport is a public airport containing a total of five runways serving mostly general aviation activities as well as limited commercial flights (AirNav 2010b). For the one-year time frame ending December 1, 2009 (most recently published statistic), Long Beach International Airport handled an average of 831 aircraft per day, of which 47% was local general aviation, 41% transient general aviation, and 10% was commercial flights (AirNav 2010b).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine whether there is a potentially significant impact generated by a project, Energy Commission staff reviews the project using the criteria found in the CEQA Guidelines Appendix G Environmental Checklist and applicable LORS utilized by other governmental agencies. Specifically, staff analyzed whether the proposed project would do the following:

- conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrians and mass transit;
- conflict with and applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways;
- result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks;
- substantially increase hazards due to a design feature or incompatible uses;
- result in inadequate emergency access; and
- conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Construction Impacts and Mitigation

Project construction is estimated to take 26 months to complete, with approximately 41 workers as the average construction workforce over this period (Watson 2009a, p. 5.11-8). However, during month 12 of construction (the peak month), the construction workforce may reach up to 80 workers (Watson 2009a, p. 5.11-8). Therefore, estimated daily construction trips associated with 80 workers during Month 24 were used to determine potential impacts, as this would represent the worst-case construction traffic scenario.

Typically, construction work starts before the 7:00 a.m. to 9:00 a.m. peak hour traffic and ends before the 4:00 p.m. to 6:00 p.m. peak hour traffic on the streets adjacent to the project site. However, for the purposes of the traffic effect analysis, it was conservatively assumed that project construction workers would commute to work within the 7:00 a.m. to 9:00 a.m. and from work within the 4:00 p.m. to 6:00 p.m. peak hours (Watson 2009a, p. 5.11-8). Also, it was assumed that all construction workers would commute alone to work (Watson 2009a, p. 5.11-8).

In addition to the construction workforce trips, construction equipment deliveries and construction-related truck traffic will contribute additional trips during project construction. Truck and heavy equipment traffic were estimated using a passenger car equivalent (PCE) factor of three cars per truck (Watson 2009a, p. 5.11-8).

Traffic and Transportation Table 5 lists the estimate of total construction vehicle trip for the proposed project, including identifying which of those would be generated during both the a.m. and p.m. peak hour periods.

Traffic and Transportation Table 5
Project Construction Trip Generation – Peak Construction Period

	Total Daily Trips	A.M. Peak Hour		P.M. Peak Hour	
		In	Out	In	Out
Construction Worker Vehicles[1]	160	80	0	0	80
Construction Worker Buses[2]	36	9	9	9	9
Delivery Vehicles (Truck/Van)[3]	42	21	0	0	21
Delivery Vehicles (Heavy Truck)[3]	42	21	0	0	21
Total Trips	*280*	*131*	*9*	*9*	*131*

Source: Watson 2009a, p.5.11-10
Notes:
[1]Peak workforce was conservatively analyzed at 80 worker trips driving alone. During the peak hours of the peak month of construction, 100% of workers are projected to commute during the morning and evening peak hours.
[2] Three buses are assumed to transport workers from off-site parking to the project site, and this value is adjusted into Passenger Car Equivalent (1 bus = 3 PCE) vehicles in the traffic effects analysis.
[3] Delivery vehicles were adjusted into Passenger Car Equivalent (1 heavy vehicle = 3 PCE) vehicles in the traffic effects analysis. Peak construction delivery trips were conservatively analyzed. During the peak month of construction, 100% of delivery trucks are projected to commute during the morning and evening peak hours.

Roadway Segment Levels of Service

Based on the construction vehicle trip calculations presented in **Traffic and Transportation Table 5**, an analysis was conducted in the AFC to determine the impacts of these construction vehicle trips on current LOS for project area roadway segments. **Traffic and Transportation Table 6** identifies the 2011 No-Project

Conditions[1] baseline traffic volume projections and compares them with 2011 Peak Project Construction Conditions to show LOS anticipated with and without the proposed project construction vehicle traffic for critical roadway segments in the vicinity of the project.

As shown in **Traffic and Transportation Table 6**, LOS of study area roadway segments will not be significantly impacted with the addition of the project peak construction traffic as compared to the future Year 2011 without project conditions. As shown, construction traffic associated with the project would only temporarily degrade the segment of eastbound Alameda Avenue between East 223rd Street and East Sepulveda Boulevard during the P.M. peak hour from LOS A to LOS B when compared to Year 2011 without project levels. As described in **Traffic and Transportation Table 1**, the city of Carson does not have any LORS specifying acceptable LOS thresholds for roadway segments (General Plan Policy TI-2.1 is specific to intersections). Therefore, as described in **Traffic and Transportation Table 2**, LOS B (stable traffic flow with minimal delay) is considered by staff to be an acceptable LOS resulting in no adverse impacts from construction traffic to roadway segment LOS.

Intersection Levels of Service

Based on the construction vehicle trip calculations presented in **Traffic and Transportation Table 5**, an analysis was conducted in the AFC to determine the impacts of these construction vehicle trips on current levels of service for project area intersections. **Traffic and Transportation Table 7** compares the 2011 No-Project Conditions traffic volume projections and the 2011 Peak Project Construction Conditions to show LOS anticipated with and without the proposed project construction vehicle traffic for critical intersections in the vicinity of the project.

As shown, construction traffic associated with the project would not degrade any analyzed intersection LOS when compared to Year 2011 without project levels. Therefore, the proposed project would not exceed any LOS threshold specified in City of Carson General Plan Transportation and Infrastructure Element Policy TI-2.1 (as described in **Traffic and Transportation Table 1**). The proposed project would be consistent with this LORS and result in no adverse impacts to intersection LOS.

Operational Impacts and Mitigation

Once operational, the proposed project would require no daily vehicle trips to and from the site for either operations and maintenance (O&M) trips outside of those already occurring as part of existing BP Refinery operation (Watson 2009a, p. 5.11-14). As no additional manpower will be needed for project operation, the current workforce of the BP Refinery will operate the project without addition of new staff, resulting in no change to the number of existing vehicle trips (Watson 2009a, p. 5.11-14). Therefore, no impacts to street segment or intersections serving the project site will occur from project operations.

---

[1] Consistent with the city of Carson Traffic Impact Analysis Guidelines, the 2011 No-Project Conditions serve as the baseline conditions in the evaluation of project construction traffic effects. The methodology for developing 2011 No-Project Conditions baseline traffic volume projections is presented in the AFC (Watson 2009a, pp. 5.11-10 through 5.11-12).

Congestion Management Program

California State Proposition 111, passed by voters in 1990, established a requirement that urbanized areas prepare and regularly update a Congestion Management Program (CMP). The purpose of the CMP is to monitor the performance of the countywide transportation system, develop programs to address near-term and long-term congestion, and better integrate transportation and land use planning. The Metropolitan Transportation Authority (MTA), as the designated Congestion Management Agency for Los Angeles County, must develop, adopt, and regularly update the CMP.

Traffic and Transportation Table 6
Current and Anticipated Year 2011 With and Without Project Roadway Segments Levels of Service - Construction

Roadway	Segment	AM						PM					
		Current		2011 Without Project		2011 With Project		Current		2011 Without Project		2011 With Project	
		V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
I-405 Freeway (NB/SB)[1]	Between Alameda St. and Wilmington Ave.	30.4/32.2	D/D	31.9/33.9	D/D	32.1/34.1	D/D	31.3/25.4	D/C	32.8/26.4	D/D	33.1/26.5	D/D
East 223rd St. (NB/SB)	Between Alameda St. and Wilmington Ave.	0.41/0.32	A/A	0.43/0.33	A/A	0.43/0.34	A/A	0.80/0.44	C/A	0.82/0.45	D/A	0.82/0.46	D/A
Alameda Ave. (EB/WB)	Between East 223rd St. and East Sepulveda Blvd.	0.34/0.32	A/A	0.35/0.33	A/A	0.35/0.37	A/A	0.58/0.38	A/A	0.60/0.39	A/A	0.63/0.39	B/A
Wilmington Ave. (EB/WB)	Between East 223rd St. and East Sepulveda Blvd.	0.49/0.43	A/A	0.51/0.44	A/A	0.51/0.45	A/A	0.48/0.56	A/A	0.49/0.58	A/A	0.50/0.58	A/A
East Sepulveda Blvd. (NB/SB)	Between Alameda St. and Wilmington Ave.	0.40/0.44	A/A	0.42/0.46	A/A	0.42/0.46	A/A	0.46/0.41	A/A	0.47/0.42	A/A	0.48/0.43	A/A

Source: Watson 2009a, pp. 5.11-11 through 5.11-13
Notes:
[1]Shown in Density (vehicle/mile/lane).
NB – Northbound; SB – Southbound; EB – Eastbound; WB – Westbound.

Traffic and Transportation Table 7
Current and Anticipated Year 2011 With and Without Project Intersection Levels of Service - Construction

Intersection[1]	AM						PM					
	Current		2011 Without Project		2011 With Project		Current		2011 Without Project		2011 With Project	
	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS	V/C	LOS
223rd St/I-405 Freeway SB on/off ramps	0.47	A	0.46	A	0.48	A	0.49	A	0.50	A	0.51	A
223rd St./Wilmington Ave.	0.75	C	0.67	B	0.67	B	0.97	E	0.91	E	0.93	E
Wilmington Ave./Sepulveda Blvd.	0.69	B	0.65	B	0.66	B	0.63	B	0.64	B	0.65	B
Sepulveda Blvd./Alameda St. ramp	0.60	A	0.56	A	0.57	A	0.56	A	0.57	A	0.58	A
Alameda St./Sepulveda Blvd. ramp	0.51	A	0.51	A	0.52	A	0.54	A	0.56	A	0.57	A
Alameda St./223rd St. connector	0.46	A	0.42	A	0.45	A	0.59	A	0.61	B	0.62	B
Alameda St./I-405 Freeway NB ramp	0.55	A	0.55	A	0.57	A	0.67	B	0.69	B	0.69	B

Source: Watson 2009a, pp. 5.11-12 and 14
Notes:
[1] For existing intersection control features refer to **Traffic and Transportation Table 4.**
NB – Northbound; SB – Southbound.

The 2004 MTA CMP identifies the I-405 Freeway as a CMP highway (MTA 2010). The CMP identifies that all highways indicated as part of the CMP network shall maintain a LOS E or better (MTA 2010). As shown in **Traffic and Transportation Table 6**, segments of the I-405 Freeway utilized by proposed project construction traffic would operate at LOS D or better. As discussed above, no operational traffic would occur from the proposed project. Therefore, less than significant impacts to CMP designated roadways would occur from construction- or operational-related project traffic.

Airports

FAA Form 7460 completion is required if the proposed project would introduce (1) any construction or alteration of more than 200-feet in height above the ground level at its site, or (2) any construction or alteration of greater height than imaginary surface extending outward and upward at the following applicable slope (100 to 1 for horizontal distance of 20,000 feet from the nearest point of the nearest runway) (FAA 2010). Based on FAA 7460 requirement (2), an outward and upward slope of 100 to 1 from the nearest Zamperini Field Airport runway, any structure over approximately 201 feet would exceed this ratio at approximately 3.8 miles distance (20,064 feet). The proposed project would not include any structures taller than 200 feet (Watson 2009a, p. 5.11-18). Therefore, no impacts to aviation activities would occur from project physical structures, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required.

Project main gas turbine/HRSG operation and wet cooling tower exhaust would result in thermal air plumes during project operation. Thermal plumes are upward clear air exhaust and have the ability to impact low flying aircraft. Currently, numerable other thermal plume sources exist around the existing refinery, with the proposed project merely adding/augmenting several thermal plume sources. Thermal plumes associated with the proposed project are expected to be similar to existing thermal plume sources within the BP Refinery. In general, low elevation overflight of the refinery should already be avoided. Furthermore, given the distance of the nearest airport facilities to the site, Zamperini Field Airport (3.8 miles) and Long Beach International Airport (3.9 miles), no low flying aircraft are expected to have direct overflight of the project site. Therefore, staff concludes that given the existing thermal plumes within the BP Refinery and the distance of the project from the nearest airports, thermal plumes associated with the proposed project would pose no significant hazard to aircraft.

Hazards and Public Safety

Construction vehicle impacts to motorist and public safety would be minimized to the maximum extent feasible by proposed Condition of Certification **TRANS-1**. **TRANS-1** requires the preparation of a construction traffic control plan that would minimize hazards due to construction related vehicles entering and exiting the project site and construction staging area, and would divert construction-related traffic to the maximum extent feasible away from residential areas.

There is also a potential for unexpected damage to roads by vehicles and equipment within the project area that could result in a roadway hazard to the public. Therefore, staff is proposing Condition of Certification **TRANS-2,** which would require that any road damaged by project construction be repaired to its original condition. This will ensure that any damage to local roadways will not be a safety hazard to motorists.

The use of oversize vehicles during construction can create a hazard to the public by limiting motorist views on roadways and by the obstruction of space. As described above in **Traffic and Transportation Table 1**, CVC Sections 35550-35559 as well as city of Carson Municipal Code, Chapter 2 (Traffic Code), Part 7 establish guidelines for oversize vehicle loads. To ensure consistency with these applicable ordinances, staff is proposing Condition of Certification **TRANS-3,** which would require that all oversize vehicles used on public roadways during construction comply with Caltrans, city of Carson, and other relevant jurisdictions limitations on vehicle sizes and weights, as well as oversize vehicle routes and any other applicable limitations or other relevant jurisdictional policies.

As discussed in the **Visual Resources** section in this Preliminary Staff Assessment (PSA) Appendix VR-2: Visible Plume Modeling Analysis, the ground fogging plume analysis indicates that the cooling tower will not create ground fogging plumes that could reach area roads. Therefore, there would be no impact on ground traffic safety.

The implementation of Conditions of Certification **TRANS-1** through **TRANS-3** would ensure that the proposed project results in less than significant hazard and safety impacts to motorists and ensure project compliance to LORS pertaining to such.

Another anticipated increase in traffic during project construction and operation would be truck trips, including delivery of hazardous materials and removal of wastes. For a discussion of the potential impacts related to the transport of hazardous materials please see the **Hazardous Materials Management** section in this PSA.

Emergency Access

In the event of an emergency at the project site during construction, emergency vehicles would likely use Wilmington Avenue and existing BP Refinery driveways to access the project site. To maintain access for emergency vehicles and allow for adequate access into and within the facility, proposed Condition of Certification **TRANS-1** requires the preparation of a construction traffic control plan which includes the assurance of access and movement of emergency vehicles. Furthermore, as the existing internal BP Refinery road network will serve the proposed project, no new roadways are required (Watson 2009a, pp. 3-44 and 45). For additional discussion of emergency services serving the facility, refer to the **Worker Safety and Fire Protection** section in this PSA.

Parking

During construction, all temporary construction equipment laydown and parking, including construction vehicle parking, construction worker parking, offices, and construction laydown areas would occur within a paved 25-acre parcel located approximately 1 mile southeast of the project site, at the northeast corner of East Sepulveda Boulevard and South Alameda Street (Watson 2009a, p. 5.11-1). The area is owned by Watson Cogeneration Company and is currently used as a truck parking and staging area (Watson 2009a, p. 5.11-1). Access from the construction laydown and parking area to the project site will occur via existing paved public roadways, with all construction related trips traveling south on South Alameda Street to East Sepulveda Boulevard, then north on Wilmington Avenue to the project site, a total travel distance of about 2 miles (Watson 2009a, p. 3-9). Therefore, no construction worker or vehicle parking will occur in or on public parking resources during construction of the proposed project. Once operational, no additional workers would be required for the proposed project and existing BP Refinery worker parking would not be affected. Therefore, both construction and operation of the proposed project will have no impact on public parking resources serving the area.

Alternative Transportation

As discussed above, no local bus stops, pedestrian facilities, or bicycle routes are within the project site footprint. Furthermore, due to the distance to railways, no railways will be directly impacted by construction or operation of the proposed project. To ensure pedestrian and bicycle safety along local roadways utilized during project construction, proposed Condition of Certification **TRANS-1** requires the preparation of a construction traffic control plan which includes the ensurance of pedestrian and bicycle safety from vehicle travel route between construction parking and staging area to the project site and identification of safety procedures for exiting and entering the site access gate. Less than significant impacts would occur to alternative transportation facilities or use during construction and operation of the proposed project.

CUMULATIVE IMPACTS AND MITIGATION

A project may result in a significant adverse cumulative impact where its effects are cumulatively considerable. *Cumulatively considerable* means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (Title 14, California Code Regulation, section 15130).

Continued development of the city of Carson has contributed to congestion on area roadways that would be used by project related traffic. The 2011 No-Project baseline traffic volume projections, as shown in **Traffic and Transportation Tables 6** and **7**, were developed in consultation with city of Carson staff through the application of an ambient 1% growth factor to existing traffic volume to account for background traffic growth and traffic generated by pending development projects that would potentially occur by 2011 (Watson 2009a, p. 5.11-8). Therefore, roadway congestion resulting from proposed project construction related traffic that could combine with cumulative project development and growth within the area was considered in the proposed project analysis.

Traffic and Transportation Tables 6 and **7** identify that construction-related traffic and activities associated with the proposed project would not result in cumulative traffic capacity related impacts as the proposed project would not result in a decrease in LOS when compared to roadway and intersection Year 2011 LOS without project related construction or operational related traffic added. As the proposed project would result in negligible operational traffic, the only contribution to the area traffic network would be from temporary construction related trips.

As discussed above and shown in **Traffic and Transportation Table 6**, construction traffic associated with the project would only temporarily degrade the segment of eastbound Alameda Avenue between East 223rd Street and East Sepulveda Boulevard during the P.M. peak hour from LOS A to LOS B when compared to Year 2011 without project levels. As construction related traffic is temporary and short-term, the temporary degradation of this roadway segment to LOS B is not considered by staff to have the potential to contribute to significant cumulative traffic impacts. Therefore, the proposed project's cumulative contribution to this impact is considered less than significant.

Conditions of Certification **TRANS-1** through **TRANS-3** are proposed to reduce the proposed project's potential to contribute cumulatively to roadway hazards, physical damage to local transportation facilities, parking, and alternative transportation impacts. These conditions ensure that the proposed project's cumulative contribution to these impacts is less than significant. Furthermore, as the proposed project results in no impacts to aviation and airport operations, it would not contribute cumulatively to any aviation impacts.

Furthermore, it is assumed that all cumulative project development occurring with the City of Carson and the surrounding area would include environmental review and mitigation similar to that for the proposed project (i.e. the development of a construction traffic control plan) and would require approval from all affected jurisdictions and agencies. This mitigation and approval would reduce not only project level transportation and traffic impacts of cumulative development, but reduce project-specific transportation and traffic impacts of cumulative projects as well. As agency approval of projects is gained, jurisdictional staggering of project construction and timing may occur to further reduce any potential cumulative transportation and traffic impacts. Therefore, the proposed project would not have a considerable cumulative contribution to transportation and traffic impacts within the area.

With regards to potential environmental justice impacts, staff has determined that all significant direct or cumulative impacts specific to traffic and transportation resulting from the construction or operation of the project would either be less than significant or with the implementation of Conditions of Certification be reduced to a less than significant levels. Therefore, the proposed project would not result in significant and unavoidable disproportionate transportation and traffic related impacts to low-income or minority populations.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Traffic and Transportation Table 8 provides a general description of applicable statutes, regulations, and standards adopted by the federal government, the State of California, and local agencies pertaining to traffic and transportation with which the project is required to comply. Conditions of certification have been proposed to ensure project consistency with a law, ordinance, regulation, or standard where it was not already mandated by federal or state regulations.

NOTEWORTHY PUBLIC BENEFITS

Neither the applicant nor staff has identified any traffic-related benefits associated with the proposed project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

To date, staff has received no public or agency comments related to traffic and transportation related issues.

Traffic and Transportation Table 8
Project Compliance with Adopted Traffic and Transportation Laws, Ordinances Regulations, and Standards

Applicable Law	LORS Description and Project Compliance Assessment
Federal	
Title 14, CFR, section 77 (14 CFR 77)	Includes standards for determining physical obstructions to navigable airspace. Sets forth requirements for notice to the Federal Aviation Administration of certain proposed construction or alterations. Also provides for aeronautical studies of obstructions to air navigation to determine their effect on the safe and efficient use of airspace (including temporary flight restrictions).
	Based on FAA 7460 requirement (2), an outward and upward slope of 10 to 1 from the nearest Zamperini Field Airport runway, any structure over approximately 201 feet would exceed this ratio at approximately 3.8 miles distance (20,064 feet). The proposed project would not include any structures taller than 200 feet. Therefore, no impacts to aviation activities would occur from project physical structures, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required.
CFR, Title 49, Subtitle B	Includes procedures and regulations pertaining to interstate and intrastate transport (includes hazardous materials program procedures) and specifies safety measures for motor carriers and motor vehicles that operate on public highways.
	Enforcement is conducted by state and local law enforcement agencies and through state agency licensing and ministerial permitting (e.g., California Department of Motor Vehicles licensing, Caltrans permits), and/or local agency permitting (e.g., Los Angeles County of Public Works permits). For a discussion of the potential impacts related to the transport of hazardous materials, please see the **Hazardous Materials Management** section in this PSA.
State	
California Vehicle Code, division 2, chapter 2.5; div. 6, chap. 7; div. 13, chap. 5; div. 14.1, chap. 1 & 2; div. 14.8; div. 15	Includes regulations pertaining to licensing, size, weight, and load of vehicles operated on highways; safe operation of vehicles; and the transportation of hazardous materials.
	Enforcement is provided by state and local law enforcement agencies and through ministerial state agency licensing and permitting and/or local agency permitting. The use of oversize vehicles during construction can create a hazard to the public by limiting motorist views on roadways and by the obstruction of space by the oversize vehicle. Therefore, staff is proposing Condition of Certification **TRANS-3,** which would require that all oversize vehicles used on public roadways during construction comply with Caltrans limitations on vehicle sizes and weights.
California Streets and Highway Code, division 1 & 2, chapter 3 & chapter 5.5	Includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits.
	Enforcement is provided by state and local law enforcement and through ministerial state agency licensing and permitting and/or local agency permitting. There is also a potential for unexpected damage to roads by vehicles and equipment within the project area. Therefore, staff is proposing Condition of Certification **TRANS-2,** which would require that any road damaged by project construction be repaired to its original condition.
Local	

Metropolitan Transportation Authority 2004 Los Angeles County Congestion Management Plan	Designates that a minimum levels of service (LOS) E performance measurement is designated for highway segments and key roadway intersections in the CMP system.
	Segments of the I-405 Freeway utilized by proposed project construction traffic and included in the CMP system would operate at LOS D or better. Furthermore, Condition of Certification **TRANS-1** will further reduce impacts from construction related trips to affected I-405 Freeway segments. No operational traffic would occur from the proposed project. Therefore, less than significant impacts to CMP designated roadways would occur from construction- or operational-related project traffic.
City of Carson General Plan – Transportation and Infrastructure Element	Policy TI-2.1: Require that new projects not cause the Level of Service for intersections to drop more than one level if it is at Level A, B or C, and not drop at all if it is at D or below, except when necessary to achieve substantial City development goals.
	As shown in **Traffic and Transportation Tables 6** and **7**, LOS of study area roadway segments and intersections will not change with the addition of the project peak construction traffic as compared to the future Year 2011 without project conditions. Furthermore, no operational traffic would occur from the proposed project. Therefore, the proposed project is consistent with this City of Carson General Plan Policy.

CONCLUSIONS

Based on the list of significance thresholds identified above, staff has analyzed potential construction and operational impacts by the proposed project related to the regional and local traffic and transportation system and conclude the following:

- The construction and operation of the proposed project as proposed with the effective implementation of staff's recommended Conditions of Certification **TRANS-1** through **TRANS-3,** would ensure that the project complies with applicable LORS regarding traffic and transportation
- LOS of study area roadway segments and intersections will not be adversely impacted with the addition of the project peak construction traffic as compared to the future Year 2011 without project conditions. Construction traffic associated with the project would only temporarily degrade the segment of eastbound Alameda Avenue between East 223rd Street and East Sepulveda Boulevard during the P.M. peak hour from LOS A to LOS B when compared to Year 2001 without project levels. This temporary degradation to LOS B is considered by staff to be an acceptable LOS resulting in no adverse impacts from construction traffic to roadway segment LOS.
- Condition of Certification **TRANS-1** should be implemented to ensure that all construction-related traffic and construction-related activities would not result in the creation of a traffic hazard during any time in the daily construction traffic cycle.
- The proposed project would not include any structures taller than 200 feet. Therefore, no impacts to aviation activities would occur from project physical structures, and completion of FAA Form 7460 or an applicant secured FAA Determination of No Hazard to Navigable Airspace is not required.
- Condition of Certification **TRANS-2** should be implemented to ensure that any road damaged by project construction be repaired to its original condition.
- Condition of Certification **TRANS-3** should be implemented to ensure that all

oversize vehicles used on public roadways during construction comply with Caltrans and City of Carson limitations on vehicle sizes and weights, as well as oversize vehicle routes and any other applicable limitations or other relevant jurisdictional policies.

- No construction worker or vehicle parking will occur in or on public parking resources during construction of the proposed project. Once operational, no additional workers would be required for the proposed project and existing BP Refinery worker parking would not be affected.
- No local rail lines or bus stops are in immediate proximity of the proposed project site. Condition of Certification **TRANS-1** should be implemented to ensure pedestrian and bicycle safety along travel routes of construction vehicles between the construction parking and staging area and the project site, as well as the identification of safety procedures for exiting and entering the site access gate.

Should the Energy Commission certify the project, staff recommends that the Energy Commission adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall consult with the City of Carson and prepare and submit to the Compliance Project Manager (CPM) for approval a construction traffic control plan and implementation program. The traffic control plan must be prepared in accordance with Caltrans Manual on Uniform Traffic Control Devices and the WATCH Manual and must include but not be limited to the following issues:

- timing of heavy equipment and building materials deliveries
- redirecting construction traffic with a flag person if required
- signing, lighting, and traffic control device placement if required
- ensurance of access for emergency vehicles into and within the project site
- ensurance of pedestrian and bicycle safety from vehicle travel route between construction parking and staging area to the project site
- specification of construction-related haul routes and employee commute routes, construction worker, equipment, and material delivery/haul route from their points of origin to Alameda Avenue and toward the offsite Construction Laydown and Parking Area, avoiding residential neighborhoods to the maximum extent feasible
- identification of safety procedures for exiting and entering the site access gate and construction parking and staging area

<u>**Verification**</u>: At least 30 days prior to site mobilization, the project owner or contractor shall provide a construction traffic control plan to the CPM for review and approval.

~~**TRANS-2** Following completion of project construction, the project owner shall repair any damage to public roadways affected by construction activity along with the primary roadways identified in the traffic control plan for construction~~

~~traffic to the road's pre-project construction condition. Prior to the start of construction, the project owner shall photograph, videotape, or digitally record images of the roadways that will be affected by all heavy construction traffic and utility line construction. The project owner shall provide the CPM, city of Carson, and/or Caltrans with a copy of the images for the roadway segments under its jurisdiction. Also prior to start of construction, the project owner shall notify the County and/or Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the project construction has taken place and to coordinate construction-related activities associated with other projects.~~

~~**Verification**: Within 30 days after completion of the project, the project owner shall meet with the CPM and City of Carson to determine and receive approval for the actions necessary and schedule to complete the repair of identified sections of public roadways to original or as near-original condition as possible. Following completion of any regional road improvements, the project owner shall provide to the CPM a letter from Caltrans if work occurred within its jurisdictional public right-of-way stating its satisfaction with the road improvements.~~

TRANS-2 During project construction, the project owner will monitor and record all incoming (loaded vehicle) traffic as part of project record keeping and compliance monitoring to ensure that project related traffic is accounted for during the construction phase of the project.

Verification: Within 30 days after completion of the project, the project owner shall provide the CPM and City of Carson project construction traffic delivery logs with a summary of daily truck traffic separate from worker or light vehicle traffic [Refer to Comment 4.10.1].

TRANS-3 The project owner shall comply with Caltrans, City of Carson, and other relevant jurisdictions limitations on vehicle sizes, weights, and travel routes and obtain any permits required for this actions. In addition, the project owner shall obtain all necessary transportation permits from Caltrans, city of Carson, and other relevant jurisdictions for roadway use.

Verification: In the Monthly Compliance Reports, the project owner shall indicate that all required permits were obtained and list the jurisdictions they were acquired from, or indicate if no permits were necessary, during that reporting period. In addition, the project owner shall retain copies of all acquired permits and supporting documentation in its compliance file for at least six months after the start of commercial operation.

REFERENCES

AirNav 2010a – Zamperini Field Airport information website [online]: http://www.airnav.com/airport/KTOA. Accessed March 22, 2010.

___ 2010b – Long Beach International Airport information website [online]: http://www.airnav.com/airport/KLGB. Accessed March 22, 2010.

CCR 2006 – California Code of Regulations, Chapter 3 (CEQA Guidelines), Article 17, §§15250—15253 as amended on July 11, 2006.

California Department of Transportation 2010a – 2010 California Vehicle Code. [online]: http://dmv.ca.gov/pubs/vctop/vc/vc.htm. Accessed March 24, 2010.

California Department of Transportation 2010b – 2010 California Street and Highway Code. [online]: http://www.legaltips.org/california/california_streets_and_highways_code/. Accessed March 24, 2010.

City of Carson 2010 – City of Carson General Conditions of Approval for the BP Watson Cogeneration Facility (tn 55948). 3/17/10.

City of Carson 2004 – General Plan Transportation and Infrastructure Element. [online]: http://ci.carson.ca.us/content/department/eco_dev_service/generalplan.asp. Accessed May 4, 2010.

FAA 2010 – Federal Aviation Administration (FAA) part 77, Federal Aviation Administration, Title 14, CFR part 77, Objects Affecting Navigable Airspace, Edition 1-1-04.

Metropolitan Transportation Authority 2010 – 2004 Congestion Management Plan. [online]: http://www.metro.net/projects/congestion_mgmt_pgm/. Accessed March 23, 2010.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

VISUAL RESOURCES

Martha A. Goodavish

SUMMARY OF CONCUSIONS

Staff has analyzed visual resource related information pertaining to the proposed Watson Cogeneration Steam and Electric Reliability Project (BP Watson) and concludes that the proposed Project would not result in any significant unavoidable adverse aesthetic or visual impacts under the California Environmental Quality Act (CEQA) and Guidelines. With staff's proposed conditions of certification, the proposed Project would conform with applicable general plan policies and zoning ordinances of the City of Carson.

INTRODUCTION

Visual resources are the visible natural and man-made features and attributes of the proposed Project setting or viewshed. The following analysis evaluates potential impacts to visual and aesthetic resources from the construction and operation of the BP Watson project under criteria of the CEQA Guidelines (California Code of Regulations Title 14) and the consistency of Project construction and operation with applicable state and local laws, ordinances, regulations, and standards (LORS).

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following table (**Visual Resources Table 1**) lists the applicable laws, ordinances, regulations, and standards applicable to the BP Watson project. Project conformance with the identified LORS is discussed in the "Compliance with Applicable LORS" section of "Impacts", below.

Visual Resources Table 1
Laws, Ordinances, Regulations, and Standards

Applicable LORS and Policies	Discussion of LORS and Policies
Federal	
Transportation Equity Act for the 21st Century of 1998 and Safe, Accountable, Flexible, and Efficient Transportation Equity Act of 2005	There are no federal lands, recognized National Scenic Byways, or All American Roads within the effective viewshed of the Project.
State	
California Streets and Highways Code, sections 260 through 263 – Scenic Highways	There are no state-eligible or designated scenic highway corridors within the effective viewshed of the Project.
Local	
General Plan, City of Carson, Chapter 2, Land Use Element (City of Carson 2004) **Policy LU-9.** Develop design standards to	The city's land use goal LU-9 is to

address permanent and effective screening of areas in transition and heavy industrial uses, such as outdoor storage yards, pallet yards, salvage yards, auto dismantling yards, and similar uses.	eliminate all evidence of property deterioration throughout Carson.
Policy LU-12.3. Review landscape plans for new development to ensure that landscaping relates well to the proposed land use, the scale of structures, and the surrounding area. **Policy – LU 12.5.** Improve city appearance by requiring landscaping to screen, buffer, and unify new and existing development. Mandate continued upkeep of landscaped areas.	The city's land use goal LU-12 is to create a visually attractive appearance throughout Carson.
Policy – LU 13.5. Continue to require landscaping treatment along any part of a building site which is visible from city streets.	The city's land use goal LU-13 is to encourage interesting and attractive streetscapes throughout Carson.
Policy – LU 14.2. Require new commercial or industrial development adjacent to and visible from freeways and freeway ramps to incorporate full architectural and landscape treatment of the building on the freeway side.	The city's land use goal LU-14 is to enhance freeway corridors and major arterials which act as gateways into the City of Carson.
General Plan, City of Carson, Chapter 8, Open Space and Conservation (OSC) (City of Carson 2004)	
Policy – OSC -1.2. Maintain existing landscaping along the City's major streets and expand the landscaping program along other arterial streets throughout the community. **Policy – OSC -1.5.** Utilize electric transmission and other utility corridors for greenbelt and recreational uses where appropriate.	The city's Open Space Goal OSC-1 is for enhanced landscaping and improved maintenance of Carson's public areas.
City of Carson Municipal Code, Article IX, Planning and Zoning, Chapter 1. Zoning, Part 4. Industrial Zones	

(eLIBRARY 2010) **Division 6. Site Development Standards, Section 9146.3 Fences, Walls and Hedges**. No fence, wall, or hedge in an industrial zone shall exceed a height of 50 feet. **Division 6. Site Development Standards, Section 9146.8 Utilities**. All new utility lines, other than major transmission lines, shall be placed underground. This requirement may be waived by the Planning Commission where topography, soil, undue financial hardship, or other conditions that make such underground installation unreasonable or impractical. All aboveground equipment (other than pole lines when permitted), such as transformers and pedestal terminals that are visible from an adjacent public street or walkway, shall be within a solid enclosure or otherwise screened from public view. Such enclosure/screening shall be in accordance with the utility's service requirement. **Division 6. Site Development Standards, Section 9146.9. Site Planning and Design.** In the case of a commercial or industrial use located on a corner lot, no public pedestrian entrance from a side street shall be located less than one hundred (100) feet from any residential zone. Mechanical equipment not enclosed within a building shall be screened from view from any adjoining public street or walkway. **Division 7. Environmental Effects, Section 9147.1 Exterior Lighting.** All lighting of buildings, landscaping, parking lots and similar facilities shall be directed away from all adjoining and nearby	

residential property. Such lighting shall be arranged and controlled so as not to create a nuisance or hazard to traffic or to the living environment. This Section is also applicable to arc lights, search lights and similar lighting devices. **Division 7. Environmental Effects, Section 9147.2 Performance Standards.** No use shall create a disturbance to the surrounding area in the form of vibration, noise, electromagnetic or other radiations, odor, dust, heat or glare. All uses shall comply with Federal, State and local laws and regulations pertaining to such environmental effects. ***City of Carson Municipal Code, Article IX, Planning and Zoning,* Chapter 1. Zoning, Part 6. General Development Standards (eLIBRARY 2010)** **Division 2. Vehicular Parking, Loading and Manuevering Areas, Off-street Parking, Section 9162.52 Landscaping Requirements, A. Interior Parking Lot Facilities.** 1. Except for parking lot facilities serving retail petroleum outlets, all required automobile parking facilities and any parking facilities visible from the public right-of-way shall have interior landscaping of no less than 5% of the area of such facilities. 2. Required setback landscaping abutting a street, sidewalk or structure, and border plantings up to five (5) feet in width abutting a building shall not be considered as interior landscaping for the purposes of this section. 3. No interior landscaping shall be located in a truck maneuvering or truck loading area. 4. Interior landscaping shall be arranged so as to provide shade for vehicles and to enhance visual attractiveness from adjoining streets and walkways. 5. Interior landscaping shall be maintained	

with an irrigation system, permanently installed which delivers water to all landscaped areas. 6. All landscaped areas and parking facilities shall be maintained to present attractive appearance at all times. 7. Unless the Director shall determine that such is not feasible, all interior areas of outdoor parking facilities which, as a result of the parking design, are unused and which are visible from a public street and walkway, shall be landscaped and maintained with an irrigation system, permanently installed, which delivers water directly to all landscaped areas. Such landscaping may be included in computing the 5% interior landscaping requirement.	

SETTING

REGIONAL LANDSCAPE SETTING

The proposed Project is located in the southeast corner of the City of Carson (City), in Los Angeles County, California. The Project would be located within the regional landscape province of the Los Angeles Basin: an elongated topographic depression consisting of a fairly flat coastal plain that stretches roughly 35 miles north to south, and 15 miles east to west. The basin is bounded by the Santa Monica and San Gabriel Mountains to the north, the Santa Ana Mountains to the east and south, and the Palos Verdes Peninsula to the west. The area experiences Mediterranean-type weather with cool, somewhat rainy winters, and warm, dry summers with ocean breezes and fog from the west predominating. Precipitation flows south across the plain in fixed concrete channels to the Pacific Ocean at Long Beach.

The City of Carson lies at the southern end of the Los Angeles Basin, surrounded by the cities of Torrance, Compton, Lakewood and Long Beach. The City is relatively flat with elevations ranging from sea level to 195 above mean sea level (amsl) (City of Carson 2002). Most of the City (83%) is developed, with the vast majority (54%) consisting of industrial land uses, followed by residential (roughly 30%) and commercial (6%) (City of Carson 2004). There are no natural open space areas within the City. Open space in the City consists of parks, play fields, golf courses, and the open space associated with utility corridors, drainages, flood control projects and street medians. The Los Angeles River and the Dominguez Canal flow through the City in concrete channels. The Dominguez Channel bisects the BP Carson Refinery (Refinery) just to the east of the Watson Cogeneration Facility (Facility) and is not open to the public (City of Carson 2002).

Project Viewshed

The viewshed for the BP Watson project site is the area of potential visual effect, or the area within which the Project could potentially be seen. Based on staff's field reconnaissance, the effective viewshed is extremely limited to the Wilmington Avenue travel corridor (sidewalk and roadway) in the vicinity of East Watson Center Road. Since the BP Watson project site is nearly surrounded by the existing Watson Cogeneration Facility (Facility) and the Refinery, views of the site from other directions are not available.

Project Location

The Project consists of a 2.5-acre site, and a 25-acre off-site construction parking and laydown area. The Project site is a brown field, located within the boundary of the existing 21.7-acre Facility, within the 428-acre parcel for the Refinery. The Project site is located at 22850 South Wilmington Avenue, Carson, California. Access to the site is via an entrance road on Wilmington Avenue, approximately 0.7 mile south of the 405 Freeway. The Facility is completely surrounded by the Refinery and is bounded by Wilmington Avenue to the west, 223rd Street to the north, South Alameda Street to the east, and East Sepulveda Boulevard to the south. No off-site improvements are currently planned for the BP Watson project. Both the Facility and the Refinery are zoned for Heavy Manufacturing.

The Refinery dominates the Project area landscape. Numerous exhaust stacks, piping, railings, vapor plumes, cooling towers, siren posts, and high voltage transmission lines and towers protrude into the sky above the Refinery grounds. The interior is devoid of trees and dominated by industrial structures, equipment, machines, and paved surfaces. There are some clusters of trees and shrubs around the perimeter of the site. Storage tanks rise above chain link and barbed wire fencing and walls that surround the Refinery site. The Refinery is seen from the 405 Freeway and the streets that surround it. The Facility, within the Refinery, cannot be seen from the 405 Freeway, or the streets that surround the Refinery, except for Wilmington Avenue. The Facility can be seen from Wilmington Avenue but is not readily noticeable due to the small scale of the cogeneration equipment (trains and cooling towers) compared to the Refinery.

Streets bordering the Refinery, Wilmington Avenue, Alameda Street, Sepulveda Boulevard, and 223rd Street support well maintained landscaped medians and shoulders with trees and plants. These streets have four lanes of traffic with turn lanes and median. Most of these streets support relatively large volumes of truck, and vehicular traffic. The City of Carson maintains all landscaping in the public right-of-way, including all center medians. The property owners west of Wilmington Avenue, north of 223rd Street, and at the Refinery maintain their own properties (City of Carson 2010a). The heavily landscaped streetscapes reflect the City's General Plan goals and policies presented above in **Visual Resources Table 1**, above.

On Wilmington Avenue, west of the Refinery and across from the entrance to the Facility, is "Watson Center" a multiple-block, light industrial, commercial office complex that supports landscape plantings, including green lawn areas, flower beds, and mature palm and other trees. To the north on 223rd Street and the 405 Freeway, there is a coffee shop, light industrial office complex, car dealerships gas stations, quick marts and fast food restaurants. The nearest residential area is 0.6 miles northwest of the

Facility at the intersection of 223rd Street and Lucerne Avenue. To the east and south of the Refinery are Alameda Street and Sepulveda Boulevard, respectively, beyond which are other industrial land uses. To the southeast, at the intersection of Sepulveda Boulevard and Wilmington Avenue is the nearest residential area (0.8 mile) to the south of the Facility.

Project Facilities

The existing facility has four General Electric 7EA combustion turbine generators (CTGs), four heat recovery steam generators (HRSGs) and two steam turbine generators (STG). The Project would add a fifth CTG with a single-pressure HRSG to the existing configuration. The new CTG would also be a General Electric 7EA CTG, which would add a nominal 85 MW to the existing facility. The HRSG would be equipped with a supplementary duct burner with up to 447.9 MMBtu/hr heat input. The applicant has not proposed to use any methods to abate visible plumes from the gas turbine/HRSG exhaust.

The most visually prominent feature of the Project would be the 100-foot high HRSG. All other facilities would be 50 feet and shorter. **Visual Resources Table 2** provides the dimensions, colors and textures of the new facilities. The new HRSG, pipe racks and cooling towers would replicate the existing on-site structures in their dimensions, colors and textures. The two cooling tower cells would be added to each end of the existing row of seven cooling tower cells. Both the HRSG and exhaust stack and the cooling towers would be constructed out of non-reflective materials. The existing maintenance shop would be demolished and a new one constructed to the west of the control building. The metal structure would be painted white. The new 69kV gas insulated substation (GIS) would be constructed in an existing parking lot adjacent to the existing office building and surrounded with unpainted masonry walls. Two new 230kV/69kV transformers would be surrounded by tan metal walls located in an existing parking lot northwest of the control building, and across the parking lot from two existing transformers.

Visual Resources Table 2
Major Project Feature Descriptions

Number	Feature	Height (feet)	Width (feet)	Length (feet)	Diameter (feet)	Color	Materials	Finish
1	HRSG Stack	100	-	-	18	Blue	Carbon Steel	Flat/Untextured
1	HRSG- excluding access platforms	50	60	100	-	Blue	Carbon Steel	Flat/Untextured
2	Cooling tower cells	45	50	55	-	Tan	Fiberglass	Flat/Untextured
1	Pipe rack north/south section	44	26	190	-	Bare Galvanized (no paint)	Carbon Steel	Flat/Untextured
1	Pipe rack east/west section	44	28	193	-	Bare Galvanized (no paint)	Carbon Steel	Flat/Untextured
1	69kV GIS – lower half	15	60	80	-	Bare (no paint)	Masonry block	Concrete
1	230/69 kV	15	50	100	-	Tan	Metal	Flat/Untextured

	GIS – upper half						siding	
1	Maintenance Shop	15	30	60	-	White	Metal	Flat/Untextured

Source: Application for Certification Table 5.13-4 and Application for Certification Figure 3-8 which was used to scale off the dimensions of the GISs (Watson 2009a).

Project Cooling

For Project cooling the applicant has proposed an addition of two new cells to the existing mechanical draft seven-cell cooling tower. The cooling tower is designed with a linear design, oriented in north to south direction, and a new cell will be added to each end of the cooling tower. The applicant has not proposed to use any methods to abate visible plumes from the cooling tower.

Project Construction

Construction would begin with demolition or removal of existing above and underground structures: warehouse, foundations, piping systems, and maintenance access roads. Although the site is relatively flat (32 feet amsl), a balanced cut and fill operation would occur to level the site. Foundation excavations would occur for the HRSG, CTG, transformers and other heavy equipment and would require removal and stockpiling of approximately 7,000 cubic yards of fill material.

Mobile trailers and suitable facilities would be used as construction offices where applicable. Primary equipment such as the CTG, HRSG sections, transformers and other equipment would be delivered to the site most likely by rail due to their weight and/or size. Other construction materials and supplies would most likely be delivered to the site by truck. A variety of construction equipment would be required: however, no cranes or other equipment that could protrude into the sky are proposed (Watson 2009a).

Plant Night Lighting

According to the Application for Certification (Watson 2009a), the existing lighting system would be expanded to cover the new equipment areas at the HRSG and cooling tower platforms and walkways, the transformer and GIS, and along new roads associated with the new facilities. Lighting would be designed and installed to minimize light emissions by shielding light sources, while meeting Occupational Safety and Health Administration (OSHA) lighting standards.

Landscaping

The Application for Certification does not propose landscaping for the BP Watson project since it lies within the Facility and is surrounded by the Refinery. The entrance into the Facility is off of Wilmington Avenue and through the Refinery entrance gate. Along Wilmington Avenue the Refinery has a partially slatted chain link fence with barbed wire above and shrubs growing near the base on the street side. Some segments of slats are missing and others are broken. At the entrance road, there is no landscaping.

Off-Site Construction

Existing water, sewer and gas utilities within the Facility will be used for connections of the Project to such facilities. Therefore, the Project does not include any new off-site facilities.

During construction, a paved 25-acre parcel located approximately one mile southeast of the BP Watson project site at 219 East Sepulveda Boulevard, near the northeast corner of East Sepulveda Boulevard and South Alameda Street, will be used for construction parking and laydown of equipment and supplies. The parcel is part of the Refinery and is currently used as a truck parking and staging area for the Refinery. During the 26 months of Project construction, the parking and laydown site would be used for construction worker parking and storage of equipment and supplies.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

To determine whether there is a potentially significant visual resources impact generated by a project, Energy Commission staff reviews the Project using the 2006 CEQA Guidelines Appendix G Environmental Checklist pertaining to “Aesthetics.” The checklist questions include the following:

A. Would the Project have a substantial adverse effect on a scenic vista?

B. Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

C. Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?

D. Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Publicly Visible Vapor Plume

In support of the four CEQA questions above, Energy Commission air quality staff conducted a “visible plume modeling analysis” of the Project (**Appendix VR-1**) to address potential visual impacts associated with water vapor plumes emitted from the Project cooling towers. Visual impacts of vapor plumes are more difficult to evaluate than structures because they are transient and vary in both size and duration depending upon operating and meteorological conditions. Vapor plumes are generally associated in the public’s mind with heavy industrial land uses and pollution, and thus tend to be regarded negatively by visually sensitive observers. Vapor plumes may attain very large size and thus affect considerably larger areas than a power plant’s structures.

Under the visual plume methodology, a visual impact may occur if the modeling analysis shows vapor plumes to occur for 20% or more of seasonal daytime clear hours, during the period of November through April (when plumes are most prevalent in the Project setting). Nighttime hours without fog are also considered in cases where night illumination could result in potential visual impacts from plumes.

The 20% criterion recognizes that plumes occurring less frequently than 20% of the seasonal period would be sufficiently infrequent as to represent a less than significant impact regardless of size. The seasonal criterion reflects the tendency of visible plumes to be concentrated in certain seasonal periods and not in others. The clear criterion reflects the fact that plumes may often form in conditions that are also conducive to fog, rain and overcast weather, but are less likely to be highly visible or perceived as substantially adverse under such conditions, since visibility and contrast of plumes is lower under such conditions.

When modeling results indicate that a Project exceeds the 20% impact criteria threshold, plume dimensions are calculated (**Appendix VR-1**). Staff considers the 20th percentile plume dimension to be the reasonable worst case on which to base its visual impact analysis. The 20th percentile plume is the smallest of the plumes that are predicted to occur zero to 20% of the time. 80% of the time the dimensions of the clear hour plumes would be smaller than the 20th percentile plume dimensions. A one percentile clear hour plume would be extremely large (physical size) and very noticeable to a wide area, but would occur very infrequently. The visual impact of the expected plume dimension is assessed in terms of contrast, scale, and view disruption from each of the KOPs.

Key Observation Points (KOPs)

Staff evaluates the existing visible physical environmental setting from representative fixed vantage points, called key observation points (KOPs). The use of KOPs or similar view locations is common in visual resource analyses conducted by the U.S. Bureau of Land Management (USDI BLM 1987) and the U.S. Forest Service (USDA Forest Service 1995). Staff uses a KOP to represent a location(s) from which to conduct detailed analyses of the proposed Project and to obtain existing condition photographs and prepare photo simulations. KOPs are selected to be representative of the most critical viewshed locations from which the Project would be seen. Because it is may not be feasible to analyze all the views in which a proposed Project would be seen, it is necessary to select KOPs that would most clearly represent the major visual effects of the proposed Project as they would be experienced by key sensitive viewing groups. **Visual Resources Figure 1** shows the location of the KOP used in this analysis:

- KOP 1 – Wilmington Avenue at East Watson Center Road

The KOP 1 vicinity represents the primary public viewing location of the Project site and the existing Facility. The Project site and the existing Facility cannot be seen from other roads or public use areas, including the 405 Freeway due to its location within the existing Refinery.

Staff's analysis of the Project's effect on this KOP is presented under "Operation Impacts". Significant impacts are identified by staff where the level of visual change caused by the Project would exceed acceptable levels in the context of a KOP's overall visual sensitivity, a measure that reflects the anticipated sensitivity of the viewing public to the visual effects of the proposed Project. Please refer to **Appendix VR-2** for a description of staff's visual resources evaluation process. **Appendix VR-3** provides visual resource terms for the purposes of this analysis.

Laws, Ordinances, Regulations and Standards (LORS)

Staff also reviews federal, state, and local LORS and their policies or guidelines for aesthetics or preservation and protection of sensitive visual resources that may be applicable to the Project site and surrounding area. These LORS include local government land use planning documents (e.g., General Plan, zoning ordinance) and are listed in **Visual Resources Table 1,** above.

DIRECT/INDIRECT IMPACTS AND MITIGATION

The impact discussion is presented under the following topics as listed in the CEQA Guidelines Appendix G: scenic vistas, scenic resources, visual character or quality, and light or glare.

Scenic Vistas

"Would the Project have a substantial adverse effect on a scenic vista?"

A scenic vista for the purpose of this analysis is defined as a distant view through or along a corridor or opening that exhibits a high level of visual quality, particularly including viewpoints identified as having scenic value in public documents.

There are no specific scenic vista points of notable importance in the KOP 1 viewshed: the only location from which the Project can be seen. The Project is surrounded by the existing Facility, Refinery and nearby industrial office parks. The one location where there are views into the Project site is at East Watson Center Road and Wilmington Avenue (KOP 1). Beyond this area, views of the Project would be screened by intervening Refinery structures, office park buildings and trees. The Project would not result in substantial view intrusion or obstruction due to its relatively small scale in the context of the Refinery complex. This is discussed further under KOP 1 in the section on "Operation Impacts" below.

Scenic Resources

"Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway corridor?"

A scenic resource for the purpose of this analysis includes a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique visual/historical importance to a community (a tree linked to a famous event or person, an ancient old growth tree); historic building; or a designated federal scenic byway or state scenic highway corridor.

There are no scenic resources that would be substantially damaged by the Project. A water feature, the Dominguez Canal runs diagonally through the Refinery site, but is closed to the public and the Project site cannot be seen from it. The terrain surrounding the Project is flat and highly urbanized with industrial and commercial development. There are no unique rock masses, outcroppings, layers or spires that would be affected by the Project. Streets surrounding the Refinery support numerous street-tree plantings which contribute to a visual attractiveness of the streetscape. However, none of the trees are of unique visual or historical importance, nor would they be affected by the

Project. The warehouse to be removed for the Project is not historically significant, and there are no other historical buildings that would be affected by the Project. The nearest scenic highway to the Project is a short segment of Highway 1, an eligible scenic highway near Seal Beach which is more than six miles southeast of the Project. The nearest National Scenic Byway is Arroyo Seco Historic Parkway - Route 110 which begins at Highway 101 near Los Angeles and extends northeast towards Pasadena and is more than 18 miles away from the Project. The Project would not be seen from these scenic highways. Thus no resources would be affected.

Visual Character or Quality

"Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?"

The Project aspects evaluated under this criterion are broken down into two categories: Construction Impacts and Operation Impacts.

Construction Impacts

The BP Watson project would use existing natural gas, water and sewer pipelines. Therefore, the Project does not include these new off-site linear appurtenances. There would be minor changes associated with electrical transmission system. Two new GISs would be constructed to connect to the existing electric transmission system substation at the Refinery.

Construction activities for the Project would occur over an approximate 26-month period. As the Project is built, the fifth train structure would rise above the 6-foot fence to a height of 100 feet (same as other trains) and would be visible from the Facility entrance area on Wilmington Avenue. Public visibility of the construction site and activities would be limited due to the location of the site within the Refinery and the presence of a 6-foot-high fence around the Refinery. The BP Watson project site is set back from Wilmington Avenue such that most views of the Facility are screened by Refinery equipment and the Refinery fencing. The entrance gate to the Facility off of Wilmington Avenue is the only location where the Facility is noticeable from street level. In general, motorists and pedestrians could experience short term views while passing by the Refinery and Facility entrance road off of Wilmington Avenue. Workers in the Watson Center buildings across the street from the entrance road may have views into the site, but the construction activity would not be highly noticeable due to the dominant industrial character of the area and the construction-like activities that occur on a regular basis at the Refinery and the existing Facility. Activities include truck and heavy equipment traffic around the site, employees walking around, noise from heavy equipment operation associated with refinery production, and exhaust emanating from numerous equipment exhaust pipes.

Project construction activity is proposed to occur typically from 6:00 a.m. to 7:00 p.m. Monday through Saturday, although longer periods could occur. During nighttime construction periods, illumination that meets state and federal worker safety regulations would be required. As a result, there would be limited times during the construction period that the Project site would be brightly illuminated at night. The existing Facility and Refinery are currently brightly illuminated at night therefore construction night lighting for the Project would not be readily noticeable from areas outside the Refinery because construction lighting would appear against the background of the existing lighting. There are no residential uses within a 0.5 mile radius of the Project.

Construction activities are anticipated to generate noise, dust, increased traffic and equipment and vehicle emissions associated with the demolition, removal, excavation and construction associated with the Project. Nearby businesses, pedestrians and motorists may experience short term visual effects associated with these construction activities. However, the effects would not be significant or adverse due to the short-term nature of the construction activities and the existing heavy industrial uses at the Refinery that surround the site. Residential areas would not be affected by the visual effects of construction due to their distance (0.5 mi and greater) from the site.

In conclusion, BP Watson project construction activities would result in less-than-significant visual effects due to the location of the Project site within the Refinery, and the industrial and commercial land uses that surround the Refinery, and the over half mile distance from the nearest residential area.

Operation Impacts

Operational impacts are assessed from a KOP identified by the applicant in the Application for Certification. Staff's field reconnaissance to the Project area found the existing Facility and Project area could only be seen from immediate vicinity of Wilmington Avenue at East Watson Center Road due to the location of the site within the Refinery. Therefore, no additional KOPs were identified for analysis. Staff concurs with the evaluations and rationales underlying the Application for Certification's conclusions on potential visual impacts to KOP 1, as presented in Section 5.13 of the Application for Certification (Watson 2009a). However, staff disagrees with the applicant's determination of Project consistency with the City of Carson's ordinances regarding development standards for landscaping which call for the development and implementation of a landscaping plan for new development. Staff also believes that more specific conditions than those proposed in the Application of Certification (Watson 2009a) are needed regarding construction and operational lighting of the Project, and surface treatment of Project structures and buildings.

KOP 1 − Wilmington Avenue at East Watson Center Road

Visual Resources Figure 2 presents a photograph of the existing Facility and BP Watson project site as seen from the northwest corner of Wilmington Avenue at Watson Center Road, looking southeast. KOP 1 is approximately 100 feet northwest of the BP Watson project site. KOP 1 provides the most unobstructed view there is of the Project, at Wilmington Avenue at Watson Center Road. From this location, the Refinery entrance driveway, chain link fencing, and barbed wire can be seen. A parking area associated with the Refinery can be seen that adjoins to the north side of the entrance driveway, beyond which the four blue HRSGs associated with the existing Facility rise into the sky. Most other structures at the Facility, such as the existing maintenance shop (where the new HRSG will be located) and control building, are obscured from view from KOP 1 by intervening slatted chain link fencing and vehicle parking in the adjoining parking lot.

VISUAL SENSITIVITY

The overall visual sensitivity of KOP 1 is considered to be *Moderately Low.* Visual sensitivity is a composite evaluation of existing visual quality, anticipated viewer concern for visual resources, and viewer exposure, each of which is discussed below.

Visual Quality

The existing visual quality of KOP 1 is considered to be *Moderately Low.* The view from KOP 1 is predominantly industrial in character. The foreground is dominated by Wilmington Avenue which is a landscaped travel corridor with four lanes of truck traffic, landscaped medians and varying amounts of landscaping on both sides of the street. The Refinery side supports slatted chain link fencing with shrubs growing on it, and the Watson Center side is lushly landscaped with green lawn areas, flower beds and palm trees. While the industrial character of the Refinery dominates, the street tree plantings provide shade and cooling, making the sidewalks and street more pedestrian friendly.

There has been a concerted effort by the City to maintain an attractive streetscape on Wilmington Avenue. The exposed chain link gate at the entrance and nearby partially deteriorated slatted chain link around the Refinery contrasts strongly with the highly attractive, well-designed landscaping associated with the Watson Center across the street. The contrast of the highly industrial Refinery area with the adjacent Watson Center development results in a low level of visual intactness and unity. While the Watson Center landscaping has an aesthetic vividness, the Refinery has an industrial vividness due to its dominant size and heavy manufacturing character. Therefore, the existing visual quality is not significantly affected by the Project.

Viewer Concern

Viewer concern from KOP 1 is considered to be *Moderately Low* due to the heavy industrial character of the area and brief viewing duration of the Project site. The Project site is located in a heavy industrial area of Carson City where truck traffic associated with heavy industry predominates. Potential viewers are motorists and pedestrians on Wilmington Avenue: a four-lane primary road with a 40 mph speed limit, average daily trips (ADTs) of over 20,000, a high percentage of which are made by trucks (Watson 2009a), and sidewalks on both sides of the street. Trucks and cars traveling on Wilmington Avenue have views of brief duration (approximately 10-20 seconds) into the Project site when stopping at the stop sign at the intersection of Watson Center and Wilmington Avenue near the BP entrance gate. Pedestrians would experience short duration views (approximately one minute) into the Project site when passing by the BP entrance gate. Therefore, the existing visual quality is not significantly affected by the Project.

Viewer Exposure

Viewer exposure is considered to be *Low*. The BP Watson project site is within the immediate foreground of KOP 1, but is not easily noticed due to the intervening land use of the Refinery and the oblique angle at which the site is located relative to Wilmington Avenue. From Wilmington Avenue, the entrance road to the Refinery and the Facility dominate the view along with a parking area and chain link fencing with barbed wire on top. In the background, the existing four light blue HRSG stacks can be seen. However, it is difficult to distinguish the existing Facility features from the Refinery features that surround it.

Viewers from KOP 1 include motorists, truck drivers, workers at Watson Center, Refinery, and the Facility, as well as pedestrians and bicyclists, resulting in a moderate number of viewers. The duration of viewing toward the Project site would be short term for most viewers (motorists, pedestrians, and workers at the Watson Center), since they would be passing views into the existing Facility while traveling past the entrance road or stopped at the light at Watson Center Road. Watson Center workers directly across from the Refinery entrance road could have longer duration views if they were in windowed buildings across from the Refinery. However, views of the Project would be limited primarily to views of the upper portion of the HRSG exhaust stack. Overall viewer exposure is considered to be *Low* due to the limited number of long-term viewers and the visual screening of the lower portion of the existing Facility provided by the intervening land use of the Refinery.

VISUAL CHANGE

As seen from KOP 1 (**Visual Resources Figure 3**), the applicant shows in its photo simulations and architectural rending that the exteriors of major project structures would be treated with a gray blue finish intended to optimize visual integration of those structures with the surrounding industrial setting. The BP Watson project would introduce into the KOP 1 viewshed, a 100-foot-tall, 60 by 100 feet -wide, light-blue-colored box-like HRSG and cylindrical exhaust stack similar in form, line, color and texture to the four existing HRSGs. A white, 15 foot high, 30 by 60 feet-wide maintenance shop would be located in front of the HRSG, against the existing six foot-high slatted chain link fence that surrounds the Facility. Two new cooling tower cells, 55 feet in diameter by 50 feet high, would be added to the existing cooling tower cells where they would not be seen from outside the Facility. The 69 kV GIS and 230/69 kV GIS would be enclosed; the 69 kV GIS would be within an unpainted masonry block walls, and the 230/69 kV GIS within tan metal walls. Staff has proposed Condition of Certification **VIS-3** which requires that all project features be colored to blend in with the existing landscape to the greatest extent feasible.

The overall visual change associated with these facilities as seen from KOP 1 would be *Moderately Low* because the Project would not be highly visible from Wilmington Avenue. Visual change is a composite evaluation of visual contrast, Project dominance, and view blockage and/or disruption, each of which is discussed below.

Visual Contrast

The visual contrast created by the BP Watson project would be *Moderately Low* as seen from KOP 1. The cylindrical form, vertical lines and color created by the new HRSG and exhaust stack would be similar in structure and same in color as the four existing HRSGs and would repeat existing forms, lines, color, textures, thus reducing visual contrasts to a low level. The new maintenance shop may be slightly more visually apparent than the existing maintenance shop due to its white color and closer proximity to the Facility site boundary. However, the six foot-high slatted chain link fence along the site boundary would screen nearly half of the building which would be 15 feet high, and 30 by 60 feet in size, and therefore not a large structure that would easily attract attention in the context of the existing view. Other facilities such as the GISs would be enclosed and of tan and gray hue, similar to other site structures, therefore not resulting in a noticeable level of contrast. The two new cooling tower cells would be similar in form, line, color and texture to the existing cells, and could not be seen from KOP 1 or other public viewing locations. Therefore, the existing visual quality is not significantly affected by the Project.

Project Dominance

The apparent size and scale of the BP Watson project as seen from KOP 1 would be dominated by the surrounding larger stacks, pipes and equipment associated with the Refinery. The proposed Project would not be readily noticeable since it would be repeating the form, line, color and texture of the existing four HRSGs. In the context of the existing Facility and the Refinery, the Project would appear as one of numerous stacks and pipes that are seen while driving along Wilmington Avenue. Project dominance, thus is *Low*.

View Blockage/Disruption

There are no scenic views or vistas within the viewshed of KOP 1. The HRSG exhaust stack does not rise above the height of existing structures of the Facility or the Refinery. As such, the Project would not block or disrupt a scenic view or vista.

IMPACT SIGNIFICANCE

Staff concludes the introduction of Project structures would not substantially degrade the existing viewshed of KOP 1. The *Moderately Low* overall visual sensitivity, combined with the *Moderately Low* overall visual change, would result in a less than significant visual impact [Refer to Comment 4.12.1]. The only portion of the BP Watson project that would be readily visible to the public would be the new HRSG and exhaust stack from the KOP 1 viewshed. While the stack would add another heavy industrial character feature to an area that is already heavily industrialized, the scale, form and color of the HRSG would not dominate the view nor would it block or disrupt any scenic views or vista. There would be no substantial change in visual quality since the limited visibility of the Project would not result in substantial alteration of the composition, vividness, unity, or intactness of the existing landscape setting.

Light and Glare

"Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? "

Project operation during times of darkness will require on-site nighttime lighting for safety and security. Lighting would provide personnel with illumination for operation under normal operating conditions, for egress during emergencies, for emergency lighting to perform manual operations during an outage of the normal power source, and convenience outlets for portable lamps and tools. Since the Project would be located within the existing Facility and surrounded by the Refinery, where nighttime, safety and emergency lighting already exist, the additional construction, nighttime, safety and emergency lighting from the BP Watson project would not be visually noticeable in the existing setting. Staff believes that the applicant's general description of light mitigation would reduce off-site light impacts; however, the description does not specifically describe what the mitigations may consist of during the project's construction and at operation. There are many light mitigation options available that are extremely effective at limiting off-site light. With the effective implementation of some or all of these measures, staff believes that the BP Watson project would not result in a substantial new source of light that could adversely affect existing nighttime views. Thus, staff has proposed Condition of Certification **VIS-2,** which limits lighting during operation and requires all fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass.

Publicly Visible Water Vapor Plumes

Visible water vapor plumes from the proposed 9-cell cooling tower, which is comprised of an existing 7-cell cooling tower with two cells added for this Project, are predicted to occur less than 20% of seasonal daylight clear hours, the frequency threshold used by staff to determine if an evaluation of vapor plume visual impacts is necessary. Therefore, no further visual impact analysis of the predicted cooling tower exhaust plumes has been completed. However, it is predicted that when plumes do form the additional two cells would increase the visible plume dimensions.

Visible water vapor plumes from the Watson gas turbine/HRSG are not predicted to occur under normal weather conditions. Therefore, no further visual impact analysis of the predicted gas turbine/HRSG exhaust plumes has been completed.

CUMULATIVE IMPACTS AND MITIGATION

Section 15355 of the CEQA Guidelines (California Code of Regulations, Title 14) defines a cumulative impact as a cumulatively considerable impact resulting from a combination of projects under consideration together with other existing or reasonably foreseeable projects causing related impacts. Cumulative impacts can result from individually minor but collectively significant impacts taking place over a period of time. The significance of a cumulative visual impact would depend on the degree to which (1) the viewshed is altered; (2) views of a scenic resource are impaired; or (3) visual quality is diminished.

As discussed under KOP 1, the viewshed would not be significantly altered by the Project. The primary visual feature of the Project, the addition of an exhaust stack similar to the existing exhaust stacks, would not significantly alter the KOP 1 viewshed. There are no views of a scenic resource that the Project would impair since the Project is surrounded by larger industrial structures. Visual quality would not be significantly diminished since the Project exhaust stack would be similar in form, line and color as the existing exhaust stacks and therefore would not be readily noticeable to most observers. The incremental impact of the Project would not be cumulatively considerable since the heavy industrial character of the Refinery would continue to dominate the visual landscape along Wilmington Avenue. There are no known Projects that would remove surrounding structures and make the Project more visible and no known Projects that would be visible within the same view as the Project. For these reasons, the Project would not cause any cumulative visual impacts.

ENVIRONMENTAL JUSTICE

Even though low-income and minority populations exist in the immediate Project area, staff has not identified any significant unmitigated adverse visual impacts with the proposed Project or cumulative impacts; therefore, no significant adverse impacts to minority or low-income populations are expected to occur.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Visual Resources Table 3 provides an analysis of the applicable LORS pertaining to the aesthetics or preservation and protection of sensitive visual resources relevant to the proposed Project. Condition of Certification **VIS-1** is proposed to make the Project conform to the LORS where appropriate.

Visual Resources Table 3
Proposed Project Consistency with LORS Applicable to Visual Resources

Source	Policies	Consistency Determination	Basis for Consistency
General Plan, City of Carson, Chapter 2, Land Use Element (City of Carson 2004)	**Policy LU-9.** Develop design standards to address permanent and effective screening of areas in transition and heavy industrial uses, such as outdoor storage yards, pallet yards, salvage yards, auto dismantling yards, and similar uses.	YES	The Project site is not readily noticeable due to intervening structures and fencing associated with the Refinery.
	Policy LU-12.3. Review landscape plans for new development to ensure that landscaping relates well to the proposed land use, the scale of structures, and the surrounding area.	YES AS CONDITIONED	Condition of Certification **VIS-1** would implement landscaping of the BP Refinery as recommended by the City of Carson Planning Department (City of Carson 2010b). The landscape plan would be reviewed and commented on by the City of Carson ensuring conformance with Policy LU-12.3.
	Policy – LU 12.5. Improve City appearance by requiring landscaping to screen, buffer, and unify new and existing development. Mandate continued upkeep of landscaped areas.	YES AS CONDITIONED	See response to Policy LU 12.3, above.
	Policy – LU 13.5. Continue to require landscaping treatment along any part of a building site which is visible from City streets.	YES AS CONDITIONED	See response to Policy LU 12.3, above.
	Policy – LU 14.2. Require new commercial or industrial development adjacent to and visible from freeways and freeway ramps to incorporate full architectural and landscape treatment of the building on the freeway side.	YES AS CONDITIONED	The Project is not visible from the nearby 405 freeway and ramps. However, the Refinery is visible from Wilmington Avenue. Condition of Certification **VIS-1** proposes the applicant develop a landscape plan for areas along Wilmington Avenue. See response to Policy LU 12.3, above.
General Plan, City	**Policy – OSC 1.2.** Maintain existing	YES AS	See response to Policy LU 12.3,

of Carson, Chapter 8, Open Space and Conservation (OSC) (City of Carson 2004)	landscaping along the City's major streets and expand the landscaping program along other arterial streets throughout the community.	CONDITIONED	above.
	Policy – OSC -1.5. Utilize electric transmission and other utility corridors for greenbelt and recreational uses where appropriate.	N/A	The Project would utilize existing electric transmission utility corridors associated with SCE's Hinson Substation.
City of Carson Municipal Code, Article IX, Planning and Zoning, Chapter 1. Zoning, Part 4. Industrial Zones (eLIBRARY 2010)	**Division 6. Site Development Standards, Section 9146.3 Fences, Walls and Hedges**. No fence, wall, or hedge in an industrial zone shall exceed a height of 50 feet.	YES	The existing Facility is fenced with six foot fencing. No new fencing is proposed as part of the Project.
	Division 6. Site Development Standards, Section 9146.8 Utilities. All new utility lines, other than major transmission lines, shall be placed underground. This requirement may be waived by the Planning Commission where topography, soil, undue financial hardship, or other conditions that make such underground installation unreasonable or impractical. All aboveground equipment (other than pole lines when permitted), such as transformers and pedestal terminals that are visible from an adjacent public street or walkway shall be within a solid enclosure or otherwise screened from public view. Such enclosure/screening shall be in accordance with the utility's service requirement.	N/A YES YES	Existing underground water and sewer utilities would be extended to accommodate the Project and no new water and sewer utilities are proposed. New aboveground transmission lines will connect the Project to the existing SCE substation at the Refinery. The Project transmission line would be underground from the generator to the existing 230kV GIS substation on the Refinery site. From the substation the power would be transferred into the existing SCE 230kV Hinson substation via an existing double circuit. The Project transmission equipment (69kV GIS and 230/69kV GIS) would not be visible from adjacent streets or walkways. The lower 69kV GIS would be enclosed in an unpainted masonry block. The upper 230/69kV GIS would be enclosed with tan colored metal siding. Both enclosures would be consistent with this ordinance.
	Division 6. Site Development Standards, Section 9146.9. Site Planning and Design. Mechanical equipment not enclosed within a building shall be screened from view from any adjoining public street or walkway.	YES YES	The cooling tower cells are mechanical equipment associated with the Project that would not be enclosed. However, they cannot be seen from any adjoining public street or walkway and therefore would be in conformance with this ordinance. The fifth train (HRSG) structure would be the same height (100-feet) as the existing four trains all of which are visible from Wilmington Avenue in the vicinity of Watson Center Road. It would

			be impractical to screen any of the trains. In addition, such screening would be inconsistent with Division 6. Site Development Standards, Section 9146.3 Fences, Walls and Hedges (see above).
	Division 7. Environmental Effects, Section 9147.1 Exterior Lighting. All lighting of buildings, landscaping, parking lots and similar facilities shall be directed away from all adjoining and nearby residential property. Such lighting shall be arranged and controlled so as not to create a nuisance or hazard to traffic or to the living environment. This section is also applicable to arc lights, search lights and similar lighting devices.	YES	There are no adjoining and nearby residential properties to the Project site. The nearest residential property is approximately 0.5 mile to the northwest of the existing Facility. Operational lighting would not be noticeably different from the existing Facility lighting and is not anticipated to result in a noticeable change to the experience of motorists on Wilmington Avenue. Since the fifth train would be set back from Wilmington Avenue by about 200 feet, and other features more, lighting is not anticipated to create a nuisance or hazard to traffic or the living environment.
	Division 7. Environmental Effects, Section 9147.2 Performance Standards. No use shall create a disturbance to the surrounding area in the form of vibration, noise, electromagnetic or other radiations, odor, dust, heat or glare. All uses shall comply with federal, state and local laws and regulations pertaining to such environmental effects.	YES	Construction activities may result in temporary visual disturbances from dust and glare in the immediate area of industrial uses that surround the site. However, these disturbances would be short-term, occurring during the 26 month construction period and would not effect any residential land uses.
City of Carson Municipal Code, Article IX, Planning and Zoning, Chapter 1. Zoning, Part 6. General Development Standards (eLIBRARY 2010)	**Division 2. Vehicular Parking, Loading and Manuevering Areas, Off-street Parking, Section 9162.52 Landscaping Requirements, A. Interior Parking Lot Facilities.** 1. Except for parking lot facilities serving retail petroleum outlets, all required automobile parking facilities and any parking facilities visible from the public right-of-way shall have interior landscaping of no less than 5% of the area of such facilities. 2. Required setback landscaping abutting a street, sidewalk or structure, and border plantings up to five (5) feet in width abutting a building shall not be considered as interior landscaping for the purposes of this Section. 3. No interior landscaping shall be located in a truck maneuvering or truck loading area. 4. Interior landscaping shall be arranged so as to provide shade for vehicles and to enhance visual attractiveness from adjoining streets and walkways. 5. Interior landscaping shall be maintained with an irrigation system,	YES AS CONDITIONED	Condition of Certification **VIS-1** calls for the Project owner to install and maintain landscaping in 5% of the parking facility and 5% of the driveway leading to the parking facility, located north of the proposed facility at the southeastern corner of Wilmington Avenue and Watson Center Road. Installation of such landscaping would partially screen views of the existing Facility and parking areas that can be seen from public right-of-ways in the immediate vicinity of Wilmington Avenue consistent with Section 9162.52 of the City of Carson municipal code.

	permanently installed which delivers water to all landscaped areas. 6. All landscaped areas and parking facilities shall be maintained to present attractive appearance at all times. 7. Unless the Director shall determine that such is not feasible, all interior areas of outdoor parking facilities which, as a result of the parking design, are unused and which are visible from a public street and walkway shall be landscaped and maintained with an irrigation system, permanently installed, which delivers water directly to all landscaped areas Such landscaping may be included in computing the 5% interior landscaping requirement.		

CONCLUSIONS

The visual analysis focused on two main issues; (1) would construction and operation of the Project cause an aesthetic impact under CEQA; and (2) would the Project comply with applicable local LORS pertaining to aesthetics, or preservation and protection of sensitive visual resources.

1. The Project would not result in a significant visual impact under CEQA since it would not adversely affect a scenic vista, substantially degrade existing scenic resources or the existing visual character or quality of the site and its surrounding, and would not create a new source of light, glare or water vapor plumes.

2. The Project would have no visual effect on any National Scenic Byway, All American Road, or State Scenic Highway.

3. The Project would be consistent with local LORS with implementation of Condition of Certification **VIS-1** calling for landscaping along Wilmington Avenue and in the parking lot to the north of the Project site as shown in **Visual Resources Figure 4**.

4. Conditions of Certification **VIS-2** regarding night lighting, and **VIS-3** regarding surface treatment of Project structures and buildings have been included to ensure that specific mitigation measures are implemented in addition to the general measures proposed in the Application for Certification (Watson 2009a).

PROPOSED CONDITIONS OF CERTIFICATION

Although staff did not find that the Project would result in significant adverse aesthetic or visual impacts under the California Environmental Quality Act and Guidelines, staff did find that the BP Watson project, as part of the Refinery, would not be consistent with the City of Carson's General Plan policies and municipal codes regarding landscaping. Therefore, staff recommends that the Energy Commission adopt the following condition of certification **VIS-1** for landscape screening if it approves the Project. Staff also included Conditions of Certification **VIS-2** for construction and operational lighting, and **VIS-3**, which calls for surface treatment of Project structures and buildings to ensure that measures stated in the Application for Certification are implemented.

LANDSCAPE SCREENING

VIS-1 The Project owner shall prepare and implement a landscape plan for the areas shown in red and green on **Visual Resources Figure 4** of the preliminary staff assessment in accordance with the City of Carson's General Plan policies and municipal codes regarding landscaping along public streets and in parking lot areas (refer back to **Visual Resources Table 2**) [Refer to Comment 4.12.2]. The landscape plan will provide interior landscaping of the Refinery parking lot that is adjacent to Wilmington Avenue and north of the Project. No less than 5% of the parking lot area shall be landscaped so as to provide shade for vehicles and to enhance visual attractiveness as seen from adjoining streets and walkways. The landscape plan will also provide landscaping along the Refinery property line on Wilmington Avenue.

The Project owner shall submit to the Compliance Project Manager for review and approval and simultaneously to the City of Carson for review and comment, a landscaping plan whose objectives is to provide an attractive visual screen from Wilmington Avenue of the Refinery, Facility, and the Project. The plan shall include:

a. a detailed landscape, grading, and irrigation plan, at a reasonable scale. The plan shall demonstrate how the requirements stated above shall be met. The plan shall provide a detailed installation schedule demonstrating installation of as much of the landscaping as early in the construction process as is feasible in coordination with project construction;

b. a list (prepared by a qualified professional arborist familiar with local growing conditions) of proposed species, specifying installation sizes, growth rates, expected time to maturity, expected size at five years and at maturity, spacing, number, availability, and a discussion of the suitability of the plants for the site conditions and mitigation objectives, with the objective of providing the widest possible range of species from which to choose;

c. maintenance procedures, including any needed irrigation and a plan for routine annual or semi-annual debris removal for the life of the project;

d. a procedure for monitoring for, and replacement of, unsuccessful plantings for the life of the project; and

e. the plan shall not be implemented until the project owner receives final approval from the Compliance Project Manager.

Verification: The landscaping plan shall be submitted to the Compliance Project Manager for review and approval and simultaneously to the City of Carson for review and comment at least 90 days prior to installation of the landscaping.

If the Compliance Project Manager determines that the plan requires revision, the project owner shall provide to the Compliance Project Manager and simultaneously to the City of Carson a revised plan for review and approval by the Compliance Project Manager.

The planting must occur during the first optimal planting season following site mobilization. The project owner shall simultaneously notify the Compliance Project Manager and the City of Carson within seven days after completing installation of the landscaping, that the landscaping is ready for inspection.

The project owner shall report landscape maintenance activities, including replacement of dead or dying vegetation, for the previous year of operation in each Annual Compliance Report.

Construction and Operational Lighting

VIS-2 The project owner shall ensure that lighting for construction of the power plant is used in a manner that minimizes potential night lighting impacts, as follows:

a. all lighting shall be of minimum necessary brightness consistent with worker safety and security;
b. all fixed position lighting shall be shielded/hooded, and directed downward and toward the area to be illuminated to prevent direct illumination of the night sky and direct light trespass (direct light extending outside the boundaries of the power plant site or the site of construction of ancillary facilities, including any security related boundaries); and
c. wherever feasible and safe and not needed for security, lighting shall be kept off when not in use.

Verification: Within seven days after the first use of construction lighting, the project owner shall notify the Compliance Project Manager that the lighting is ready for inspection. If the Compliance Project Manager requires modifications to the lighting, within 15 days of receiving that notification the project owner shall implement the necessary modifications and notify the Compliance Project Manager that the modifications have been completed.

Within 48 hours of receiving a lighting complaint, the project owner shall provide the Compliance Project Manager with a complaint resolution form report as specified in the General Conditions section including a proposal to resolve the complaint, and a schedule for implementation [Refer to Comment 4.12.3]. The project owner shall notify the Compliance Project Manager within 48 hours after completing implementation of the proposal. A copy of the complaint resolution form report shall be included in the subsequent Monthly Compliance Report.

Surface Treatment of Project Structures and Buildings

VIS-3 The project owner shall treat the surfaces of all project structures and buildings on site, including those of the existing power plant, visible to the public such that (a) their colors minimize visual intrusion and contrast by blending with existing structures; (b) their colors and finishes do not create excessive glare; and (c) their colors and finishes are consistent with local policies and ordinances. The transmission line conductors shall be non-specular and non-reflective; and the insulators shall be non-reflective and non-refractive.

The project owner shall submit for Compliance Project Manager review and approval, a specific surface treatment plan that will satisfy these requirements. The treatment plan shall include:

a. description of the overall rationale for the proposed surface treatment, including the selection of the proposed colors and finishes;

b. list of each major project structure, building, tank, pipe, and wall; the transmission line towers and/or poles; and fencing, specifying the color(s) and finish proposed for each. Colors must be identified by vendor, name, and number; or according to a universal designation system;

c. one set of color brochures or color chips showing each proposed color and finish;

d. one set of 11" x 17" color photo simulations at life size scale, of the treatment proposed for use on project structures, including structures treated during manufacture as well as those of the existing on-site power plant, from Key Observation Point 1 (location shown on Figure 1 of the Preliminary Staff Assessment);

e. specific schedule for completion of the treatment; and

f. a procedure to ensure proper treatment maintenance for the life of the project.

Verification: At least 90 days prior to specifying to the vendor the colors and finishes of the first structures or buildings that are surface treated during manufacture, the Project owner shall submit the proposed treatment plan to the Compliance Project Manager for review and approval and simultaneously to the City of Carson Planning Division for review and comment.

If the Compliance Project Manager determines that the plan requires revision, the Project owner shall provide to the Compliance Project Manager a plan with the specified revisions for review and approval by the Compliance Project Manager before any treatment is applied. Any modifications to the treatment plan must be submitted to the Compliance Project Manager for review and approval.

Prior to the start of commercial operation, the Project owner shall notify the Compliance Project Manager that surface treatment of all listed structures and buildings has been completed and they are ready for inspection and shall submit one set of electronic color photographs from the same key observation point identified in (d) above.

The Project owner shall provide a status report regarding surface treatment maintenance in the Annual Compliance Report. The report shall specify: (a) the condition of the surfaces of all structures and buildings at the end of the reporting year; (b) maintenance activities that occurred during the reporting year; and (c) the schedule of maintenance activities for the next year.

REFERENCES

Caltrans (California Department of Transportation). 2007. Caltrans Officially Designated State Scenic Highways. Site visited on September 22, 2010. http://www.dot.ca.gov/hq/LandArch/scenic_highways/index.htm.

City of Carson. 2010a. Email communication by Candace Hill, Planner I, California Energy Commission, to John Signo, Senior Planner, City of Carson, Planning Division. September 23, 2010.

City of Carson 2010b City of Carson Planning Division correspondence, Landscaping requirements (tn 56035), March 25, 2010.

City of Carson. 2004. General Plan, City of Carson. Adopted October 11, 2004. Chapter 2 Land Use Element, and Chapter 8, Open Space and Conservation Element. Site visited on September 22, 2010. http://ci.carson.ca.us/content/files/pdfs/GenPlan/Chapter00.TableofContents.pdf.

City of Carson. 2002. City of Carson, Public Review Draft October 30, 2002, General Plan, Environmental Impact Report, Section 4-12. Aesthetics. Site visited on September 22, 2010. http://ci.carson.ca.us/content/files/pdfs/GenPlan/EIR/Section04-12.Aesthetics.pdf.

eLIBRARY – Code Publishing Company 2010. Site visited on September 22, 2010. http://www.codepublishing.com/ca/carsonplanning/.

U.S. Department of Agriculture, Forest Service 1995. Landscape Aesthetics, A Handbook for Scenery Management. Agricultural Handbook Number 701.

U.S. Department of Interior, Bureau of Land Management (BLM) 1987. Visual Resorce Management, BLM Handboolk et. seq.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Appendix VR-1: Visible Plume Modeling Analysis

William Walters, P.E.

INTRODUCTION

The following provides the assessment of the cooling tower and gas turbine/HRSG visible plumes for the Watson Cogeneration Steam and Electric Reliability Project (BP Watson). Staff completed a modeling analysis for the applicant's proposed cooling tower and gas turbine/HRSG designs.

PROJECT DESCRIPTION

For Project cooling the applicant has proposed an addition of two new cells to the existing mechanical draft 7-cell cooling tower. The cooling tower is designed with a linear design, oriented in north to south direction, and a new cell will be added to each end of the cooling tower. The applicant has not proposed to use any methods to abate visible plumes from the cooling tower.

The existing facility has four GE 7EA CTGs, four heat recovery steam generators (HRSGs) and two steam turbine generators (STG). The Project would add a fifth combustion turbine generator (CTG) with a single-pressure HRSG to the existing configuration. The new CTG would also be a General Electric (GE) 7EA CTG, which would add a nominal 85 MW to the existing facility. The HRSG would be equipped with a supplementary duct burner with up to 447.9 MMBtu/hr heat input. The applicant has not proposed to use any methods to abate visible plumes from the gas turbine/HRSG exhaust.

VISIBLE PLUME MODELING METHODS

VISIBLE PLUME FREQUENCY AND DIMENSION MODELING

The Combustion Stack Visible Plume (CSVP) model was used to estimate visible plume frequency and visible plume dimensions for both the cooling tower and gas turbine/HRSG exhaust. This model provides conservative estimates of both visible plume frequency and visible plume dimensions. This model utilizes hourly cooling tower and gas turbine/HRSG exhaust parameters and hourly ambient condition data to determine the visible plume frequency. This model is based on the algorithms of the Industrial Source Complex model (Version 2), that determine conditions at the plume centerline, but this model does not incorporate building downwash.

The modeling method combines the cooling tower cell exhausts into an equivalent single stack. This method may overestimate cooling tower visible plume dimensions (particularly height) during predicted visible plume hours with higher winds due to reduced cell exhaust interaction and the potential for building downwash, but will be more accurate during low wind and calm periods when the exhausts from the cooling tower cells will combine into one coherent body.

Wind speeds are set to one meter per second during calm hours.

The Seasonal/Annual Cooling Tower Impacts (SACTI) model was used to determine frequency and direction of potential visible plume ground fogging events that could impact traffic safety for roads surrounding the Project site.

CLOUD COVER DATA ANALYSIS METHOD

A visible plume frequency of 20% of seasonal (November through April) daylight no rain/fog high visual contrast (i.e. "clear") hours is used to determine potential visible plume impact significance. The methodology used to determine high visual contrast hours is provided below:

The Energy Commission has identified a "clear" sky category during which visible plumes have the greatest potential to cause adverse visual impacts. For this Project the meteorological data set[1] used in the analysis categorizes sky cover in 10% increments. Staff has included in the "Clear" category a) all hours with sky cover equal to or less than 10% plus b) half of the hours with total sky cover 20-90%. The rationale for including these two components in this category is as follows: a) visible plumes typically contrast most with sky under clear conditions and, when total sky cover is equal to or less than 10%, clouds either do not exist or they make up such a small proportion of the sky that conditions appear to be virtually clear; and b) for a substantial portion of the time when total sky cover is 20-90% the opacity of sky cover is relatively low (equal to or less than 50%), so this sky cover does not always substantially reduce contrast with visible plumes; staff has estimated that approximately half of the hours meeting the latter sky cover criteria can be considered high visual contrast hours and are included in the "clear" sky definition.

If it is determined that the seasonal daylight clear hour visible plume frequency is greater than 20% then visible plume dimensions are calculated, and a significance analysis of the plumes is included in the Visual Resources section of the Preliminary Staff Assessment.

COOLING TOWER VISIBLE PLUME MODELING ANALYSIS

Staff evaluated the applicant's Application for Certification, Application for Certification Supplement and data responses (Watson 2009a, Watson 2009e, URS 2009e) and performed an independent psychrometric analysis. The Combustion Stack Visible Plume (CSVP) model was used to estimate the worst-case potential visible plume frequency and dimensions for the cooling tower.

COOLING TOWER PARAMETERS

Based on the cooling tower parameters anticipated by the applicant, the frequency of visual plumes can be estimated. The exhaust data for the cooling tower are provided in **Visible Plume Table 1**.

[1] This analysis uses five years of South Coast Air Quality Management District AERMOD meteorological data (2002-2006), available from their website, which was collected from the Long Beach monitoring station. Hours with missing data were excluded.

Visible Plume Table 1
Cooling Tower Exhaust Parameters [a]

Parameter		Cooling Tower Design Parameters		
Number of Cells		9 Cells		
Cell Height		50.85 feet (15.5 meters)		
Cell Stack Diameter		30.5 feet (9.3 meters)		
Case	**Ambient Condition**	**Heat Rejection Rate (MW)**	**Exhaust Flow Rate (K lbs/hr)**	**Exhaust Temp (°F) [a]**
1	36°F, 36% RH	181.17	37,926	60.9
2	59°F, 60% RH	180.63	37,260	74.6
3	85°F, 60% RH	179.82	36,252	89.7

Source: Watson 2009a, Watson 2009b, Watson 2009e.

The information supplied by the applicant was used to interpolate the operating conditions for the cooling tower exhaust to the different modeled hourly ambient conditions. The applicant provided information on the two new cooling tower cells and indicated that exhaust conditions would be similar for the existing seven cooling tower cells (URS 2009e). For modeling purposes, when the cooling tower physical dimensions did not match the existing cooling tower dimensions (such as exhaust height), they were standardized to the dimensions provided for the existing 7-cell cooling tower.

COOLING TOWER VISIBLE PLUME MODELING RESULTS

Visible Plume Table 2 provides the CSVP model visible plume frequency results for year round full load operation using a five year (2002-2006) Long Beach meteorological data set, obtained from the South Coast Air Quality Management District website.

Visible Plume Table 2
Staff Predicted Hours with Cooling Tower Visible Plumes
Long Beach 2002-2006 Meteorological Data

Case	Available (hr)	Full Load	
		Plume (hr)	Percent
All Hours	40,701	12,991	31.92%
Daylight Hours	19,591	2,425	12.38%
Daylight No Rain No Fog	19,457	2,305	11.85%
Seasonal Daylight No Rain No Fog[a]	8,891	1,546	17.39%
Seasonal Daylight Clear[a]	5,300	573	10.81%

Note:
a. Seasonal conditions occur anytime from November through April.

Visible water vapor plumes from the proposed cooling tower are predicted to occur less than 20% of seasonal daylight clear hours. Therefore, plume dimension modeling and additional impact analysis for the cooling tower visible plumes is not required for this Project. The addition of two cooling tower cells is not predicted to impact plume frequency, but would increase plume dimensions when plumes do occur.

COOLING TOWER GROUND FOGGING MODELING RESULTS

The Seasonal/Annual Cooling Tower Impacts (SACTI) model was used to determine frequency and direction of potential ground fogging plume events that could impact traffic safety on roads near the site. The SACTI model was run using the 59°F ambient temperature case data that was provided in **Visible Plume Table 1**.

Visible Plume Table 3 provides the SACTI model predicted hours of plume ground fogging with direction and distance for the ground fogging events.

Visible Plume Table 3
Predicted Hours of Ground Fogging Plumes
Year Round Full Load Operation
Long Beach 2002-2006 Meteorological Data

	Plume From			
	WSW	W	WNW	All
	Plume Headed			
Distance from tower (m)	ENE	E	ESE	Sum
100	0.6	0.8	0.6	1.9
200	0.4	1.0	0.4	1.8
300	0.0	0.9	0.0	0.9
400	0.0	0.1	0.0	0.1

The SACTI model predicts that less than two hours of ground fogging plumes would occur for the five years modeled. Fogging plumes are predicted to head toward the east northeast, east, and east southeast directions. Ground fogging plumes are only predicted further up to 400 meters in east northeast, east and east southeast direction, and these plumes would have no impacts on traffic safety since the nearest road, S. Alameda Street, is located east approximately 1,000 meters away from the cooling tower. Even if plume fogging were to happen during meteorological or operating conditions not captured in this modeling analysis, it is almost certain that such ground fogging plumes would not be able to cross through the additional air turbulence to reach area roads that are located more than 600 meters in all directions from the cooling tower.

GAS TURBINE/HRSG VISIBLE PLUME MODELING ANALYSIS

GAS TURBINE/HRSG DESIGN AND OPERATING PARAMETERS

The following gas turbine/HRSG design characteristics, presented below in **Visible Plume Table 4**, were determined through a review of the applicant's Application for Certification and Application for Certification Supplement (Watson 2009a, Watson 2009, Watson 2009e). The data presented in **Visible Plume Table 4** was used to model the gas turbine/HRSG visible plume frequency and dimensions.

Visible Plume Table 4
Gas Turbine/HRSG Operating and Exhaust Parameters [a]

Parameter	**Gas Turbine/HRSG Exhaust Parameters**		
Stack Height	100 feet (30.48 meters)		
Stack Diameter	15.5 feet (4.72 meters)		
Ambient Conditions	Moisture Content (% by weight)	Exhaust Flow Rate (klbs/hr)	Exhaust Temp (°F)
36°F	5.73%	2,529	386
59°F	6.31%	2,434	385
85°F	7.15%	2,294	383

Source: Watson 2009a, Watson 2009b, Watson 2009e
Note:
a. Values were extrapolated or interpolated between hourly ambient condition data points as necessary.

The information supplied by the applicant was used to interpolate the operating conditions for the gas turbine/HRSG exhaust to the different modeled hourly ambient conditions.

GAS TURBINE/HRSG TURBINE VISIBLE PLUME MODELING RESULTS

Staff evaluated the applicant's Application for Certification and Application for Certification Supplement (Watson 2009a, Watson 2009e) and performed an independent psychrometric analysis. The Combustion Stack Visible Plume (CSVP) model was used to estimate the worst-case potential plume frequency for the new gas turbine/HRSG stack proposed. **Visible Plume Table 5** provides the CSVP model visible plume frequency results for year round full load operation using a five year (2002-2006) Long Beach meteorological data set, obtained from the South Coast Air Quality Management District website.

Visible Plume Table 5
Predicted Hours with Gas Turbine/HRSG Visible Plumes
Year Round Full Load Operation
Long Beach 2002-2006 Meteorological Data

Case	Available (hr)	Plume (hr)	Percent
All Hours	40,701	0	0.00%
Daylight Hours	19,591	0	0.00%
Daylight No Rain No Fog	19,457	0	0.00%
Seasonal Daylight No Rain No Fog[a]	8,891	0	0.00%
Seasonal Daylight Clear[a]	5,300	0	0.00%

Note:
a. Seasonal conditions occur anytime from November through April.

The CSVP model predicted that there would be no visible plumes to occur for the proposed gas turbine/HRSG exhaust. Therefore, plume dimension modeling and additional impact analysis for the gas turbine/HRSG visible plumes is not required for this Project.

CONCLUSIONS

Visible water vapor plumes from the proposed 9-cell cooling tower, which is comprised of an existing 7-cell cooling tower with two cells added for this Project, are predicted to occur less than 20 % of seasonal daylight clear hours. Therefore, no further visual impact analysis of the predicted gas turbine/HRSG exhaust plumes has been completed. However, it is predicted that when plumes do form the additional two cells would increase the visible plume dimensions.

The ground fogging plume analysis indicates that the cooling tower will not create ground fogging plumes that could reach area roads. Therefore, there would be no impact on ground traffic safety.

Visible water vapor plumes from the BP Watson project gas turbine/HRSG are not predicted to occur under normal weather conditions. Therefore, no further visual impact analysis of the predicted gas turbine/HRSG exhaust plumes has been completed.

REFERENCES

URS 2009e – URS Corp/Cindy Kyle-Fisher (tn 53800). Remainder of Applicant's Data Request Responses (1-39), dated 10/23/09. Submitted to CEC/Docket Unit on 10/26/09.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009b – Watson Cogeneration Company/Thomas A. Lu (tn 50585). Air Quality DVD and INPUT/OUTPUT Modeling Files, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009e – Watson Cogeneration Company/Thomas A. Lu (tn 52187). Supplement in Response to CEC Data Adequacy Review, dated 6/29/09. Submitted to CEC/Docket Unit on 6/29/09.

APPENDIX VR-2

STAFF'S VISUAL RESOURCES EVALUATION METHODOLOGY

Staff evaluates the visual characteristics of the existing physical setting, the proposed Project, the circumstances affecting the viewer, and the degree of visual change that a proposed Project may introduce using the identified elements and generally accepted criteria for determining substantial environmental impact significance identified below.

ELEMENTS OF THE METHODOLOGY

Key Observation Points

Staff evaluates the existing visible physical environmental setting from a fixed vantage point, called a *key observation point* (KOP), that provides a view of the visual change introduced by the proposed Project to the view from that KOP. The view as seen from the KOP is referred to as the *viewshed*. Staff uses a KOP[2] to represent a location(s) from which to conduct detailed analyses of the proposed Project and to obtain existing condition photographs and prepare photo simulations. KOPs are selected to be representative of the most critical viewshed locations from which the Project would be seen. Because it is not feasible to analyze all the views in which a proposed Project would be seen, it is necessary to select a KOP that would most clearly display the visual effects of the proposed Project. A KOP may also represent primary viewer groups that would potentially be affected by the Project. In addition to KOP photo(s), staff reviews landscape character photos that help provide a visual overview of a Project site, its vicinity, and the selected KOP area, as appropriate. Prior to application submittal, staff participates in the selection of appropriate KOP(s) for the analysis.

LORS Consistency

Energy Commission considers federal, state, and local laws, ordinances, regulations, and standards (LORS) relevant to aesthetics or protection and preservation of visual sensitive resources. Conflicts with such LORS can constitute significant visual impacts. For example, visual staff examines land use planning documents, such as a local government's General Plan, Specific Plan, and zoning ordinances applicable to the Project site and surrounding area to gain insight as to the type of land uses intended for the area, and the guidelines given for aesthetics, or protection and preservation of visual sensitive resources.

California Environmental Quality Act Guidelines

The CEQA Guidelines define a "significant effect on the environment" to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the Project including . . . objects of historic or aesthetic significance" (California Code of Regulations, Title 14, section 15382).

Appendix G Environmental Checklist Form of the CEQA Guidelines, under "Aesthetics,"

[2]The use of KOPs or similar view locations is common in visual resource analysis. The U.S. Bureau of Land Management (USDI BLM 1986a, 1986b, 1984) and the U.S. Forest Service (USDA Forest Service 1995) use such an approach.

lists the following four questions to be addressed regarding whether the potential impacts of a Project are significant:

A. Would the Project have a substantial adverse effect on a scenic vista?

B. Would the Project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

C. Would the Project substantially degrade the existing visual character or quality of the site and its surroundings?

D. Would the Project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

Staff answers each of the four checklist questions for the proposed Project, including any related facility such as a transmission line or gas pipeline, for both construction and operation phases.

APPENDIX VR-3

ENERGY COMMISSION STAFF - VISUAL ANALYSIS TERMS

For the purpose of this visual analysis, Energy Commission staff has defined the following visual related terms:

Duration of View - ranges from *high* (extended), a view of the Project site that is reached across an extended distance or amount of time, to *low* (brief), a view of the Project site that is reached in a short amount of distance or time. The range of view duration generally differs depending on the type of activity in which the viewer is engaged.

Scenic Resource - a unique water feature (waterfall, transitional water, part of a stream or river, estuary); a unique physical geological terrain feature (rock masses, outcroppings, layers or spires); a tree having a unique visual/historical importance to a community (a tree linked to a famous event or person, an ancient old growth tree); historic building; or a designated federal scenic byway or state scenic highway corridor.

Scenic Vista - a distant view through and along a corridor or opening that exhibits a high degree of pictorial quality.

Viewer Concern - estimated level of a viewer's anticipated interest in preserving and protecting the existing physical environment. Viewer attitudes and expectations are often correlated with viewer activity type (e.g., viewers engaged in certain activities, such as recreation, are considered to have high levels of concern for scenic quality, while those engaged in other activities, such as work, are generally considered to have lower levels of concern). Residences are generally considered to have high viewer concern.

Existing landscape character may temper viewer concern on some state and locally designated scenic highways and corridors. Similarly, travelers on other highways and roads, including those in agricultural areas, may have moderate viewer concern depending on viewer expectations as conditioned by regional and local landscape features. Commercial uses, including business parks, typically have low-to-moderate viewer concern, though some commercial developments have specific requirements related to visual quality with respect to landscaping, building height limitations, building design, and prohibition of above-ground utility lines, thus indicating a higher level of viewer concern. Industrial uses typically have the lowest viewer concern because workers are focused on their work and generally are working in surroundings with relatively low visual value.

Viewer Exposure – the primary factors affecting viewer susceptibility to impacts, including visibility of a landscape feature, the number of viewers, distance, and the duration of the view.

Viewshed – an area visible to an observer from a fixed vantage point, called a *key observation point* (KOP). Staff uses a 35mm camera with a focal length of 50mm which encompasses an approximate image angle of 46^0. The staff uses a field of view that is not to be confused with a panoramic (180^0) or cycloramic (360^0) view. These are broad horizontal composition with no apparent limits to the view.

Visibility - the level to which the proposed Project site is visually obstructed by natural and/or man-made surface features (development, vegetation, hills) from the key observation point.

Visual Contrast - the conspicuousness or prominence of a Project and its compatibility with its setting. Visual contrast is described in terms of formal attributes of form, line, color, and texture of the Project in comparison to those of the setting. Staff considers the proposed Project's introduction of form (shape and mass), line (changes in edge types and interruption or introduction of edges, bands, and silhouette lines), color (surface color, reflectivity, and glare), and texture (noticeable differences in the grain or irregularity and directional patterns) to the existing physical environment to determine the degree of contrast**.** Degree of contrast: *none* – the element contrast is not visible or perceived; *weak* – the element contrast can be seen but does not attract attention; *moderate* – the element contrast begins to attract attention and begins to dominate the characteristic landscape; *strong* – the element contrast demands attention, will not be overlooked, and is dominant in the landscape.

Visual Disruption - the extent to which a previously visible scenic resource or scenic vista in the existing physical environment is blocked from view by the proposed Project. The view disruption is assigned greater weight according to the quality and importance of the blocked view.

Visual Quality – the estimated visual impression and appeal of the existing physical environmental setting and the associated public value attributed to it. An outstanding visual quality is a rating reserved for landscapes that would be what a viewer might think of as "picture postcard" landscapes. Low visual quality describes landscapes that are often dominated by visually discordant human alterations and do not provide views that people would find inviting or interesting (Buhyoff et al. 1994).

Visual Scale - the proposed Project's apparent size relationship with other components in the existing physical environment relative to the total field-of-view as viewed by the human eye, or the lens of a 35mm camera with a focal length of 50mm.

Visual Sensitivity - the overall level of sensitivity of a viewshed due to visual change that is a function of visual quality, viewer concern, and viewer exposure.

WASTE MANAGEMENT

Ellie Townsend-Hough

SUMMARY OF CONCLUSIONS

Management of the waste generated during demolition, construction and operation of the Watson Cogeneration Steam and Electric Reliability (BP Watson) Project would not result in any significant adverse impacts and would comply with applicable waste management laws, ordinances, regulations, and standards if the measures proposed in the Application for Certification and staff's proposed conditions of certification are implemented. The applicant has provided a Phase I Environmental Site Assessment which identifies a number of Recognized Environmental Conditions that indicate the presence or likely presence of hazardous substances or petroleum products on the project site. To further assess and remediate the soil contamination on the site, the applicant must provide, prior to site mobilization for project construction, a Soils Management Plan for the project site, as required by the Los Angeles Regional Water Quality Control Board's existing Cleanup and Abatement Orders that cover the entire BP Carson Refinery industrial complex. The purpose of the Soils Management Plan is to identify, remove, and dispose of contaminated soils. Condition of Certification **WASTE-2** assures that remediation of site soil contamination and related water pollution are addressed as part of the Los Angeles Regional Water Quality Control Board's overall regulatory program, as prescribed in the existing Cleanup and Abatement Orders for the BP Watson Industrial complex.

INTRODUCTION

This Preliminary Staff Assessment (PSA) presents an analysis of issues associated with wastes generated from the proposed construction and operation of the Watson Steam and Electric Reliability Project. The technical scope of this analysis encompasses solid wastes existing on site and those to be generated during demolition of existing facilities and during facility construction and operation. Management and discharge of wastewater is addressed in the **Soil and Water Resources** section of this document. Additional information related to waste management may also be covered in the **Worker Safety** and **Hazardous Materials Management** sections of this document.

The objectives of the Energy Commission staff's waste management analysis are to ensure that:

- The management of project wastes would be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during the construction and operation of the proposed project would be managed in an environmentally safe manner.
- The disposal of project wastes would not result in significant adverse impacts to existing waste disposal facilities.
- Upon project completion, the site is managed in such a way that project wastes and waste constituents would not pose a significant risk to humans or the environment.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

The following federal, state, and local environmental laws, ordinances, regulations, and standards have been established to ensure the safe and proper management of both solid and hazardous wastes in order to protect human health and the environment. Project compliance with the various LORS is a major component of staff's determination regarding the significance and acceptability of the BP Watson project with respect to management of waste.

Waste Management Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	
Title 42, United States Code, §§ 6901, et seq. Solid Waste Disposal Act of 1965 (as amended and revised by the Resource Conservation and Recovery Act of 1976, et al.)	The Solid Waste Disposal Act, as amended and revised by the Resource Conservation and Recovery Act (RCRA) et al., establishes requirements for the management of solid wastes (including hazardous wastes), landfills, underground storage tanks, and certain medical wastes. The statute also addresses program administration, implementation, and delegation to states, enforcement provisions, and responsibilities, as well as research, training, and grant funding provisions. RCRA Subtitle C establishes provisions for the generation, storage, treatment, and disposal of hazardous waste, including requirements addressing: • generator record keeping practices that identify quantities of hazardous wastes generated and their disposition; • waste labeling practices and use of appropriate containers; • use of a manifest when transporting wastes; • submission of periodic reports to the United States Environmental Protection Agency (U.S. EPA) or other authorized agency; and • corrective action to remediate releases of hazardous waste and contamination associated with RCRA-regulated facilities. RCRA Subtitle D establishes provisions for the design and operation of solid waste landfills. RCRA is administered at the federal level by U.S. EPA and its 10 regional offices. The Pacific Southwest regional office (Region 9) implements U.S. EPA programs in California, Nevada, Arizona, and Hawaii.
Title 42, United States Code, §§ 9601, et seq. Comprehensive Environmental Response, Compensation and Liability Act	The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), also known as Superfund, establishes authority and funding mechanisms for cleanup of uncontrolled or abandoned hazardous waste sites, as well as cleanup of accidents, spills, or emergency releases of pollutants and contaminants into the environment. Among other things, the statute addresses: • reporting requirements for releases of hazardous substances; • requirements for remedial action at closed or abandoned hazardous waste sites and brownfields; • liability of persons responsible for releases of hazardous substances or waste; and • requirements for property owners/potential buyers to conduct "all

	appropriate inquiries" into previous ownership and uses of the property to 1) determine if hazardous substances have been or may have been released at the site and 2) establish that the owner/buyer did not cause or contribute to the release. A Phase I Environmental Site Assessment is commonly used to satisfy CERCLA's "all appropriate inquiries" requirements.
Title 40, Code of Federal Regulations (CFR), Subchapter I – Solid Wastes	These regulations were established by U.S. EPA to implement the provisions of the Solid Waste Disposal Act and RCRA (described above). Among other things, the regulations establish the criteria for classification of solid waste disposal facilities (landfills), hazardous waste characteristic criteria and regulatory thresholds, hazardous waste generator requirements, and requirements for management of used oil and universal wastes. • Part 246 addresses source separation for materials recovery guidelines. • Part 257 addresses the criteria for classification of solid waste disposal facilities and practices. • Part 258 addresses the criteria for municipal solid waste landfills. • Parts 260 through 279 address management of hazardous wastes, used oil, and universal wastes (i.e., batteries, mercury-containing equipment, and lamps). U.S. EPA implements the regulations at the federal level. However, California is an authorized state so the regulations are implemented by state agencies and authorized local agencies in lieu of U.S. EPA.
Title 40, CFR, Part 6.3, Subpart GGGGG—National Emission Standards for Hazardous Air Pollutants: Site Remediation	This subpart establishes national emissions limitations and work practice standards for hazardous air pollutants (HAP) emitted from site remediation activities. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emissions limitations and work practice standards.
Title 49, CFR, Parts 172 and 173 Hazardous Materials Regulations	U.S. Department of Transportation established standards for transport of hazardous materials and hazardous wastes. The standards include requirements for labeling, packaging, and shipping of hazardous materials and hazardous wastes, as well as training requirements for personnel completing shipping papers and manifests. Section 172.205 specifically addresses use and preparation of hazardous waste manifests in accordance with Title 40, CFR, and section 262.20.
State	
California Health and Safety Code, Chapter 6.5, §§ 25100, et seq. Hazardous Waste Control Act of 1972, as amended	This California law creates the framework under which hazardous wastes must be managed in California. The law provides for the development of a state hazardous waste program that administers and implements the provisions of the federal RCRA program. It also provides for the designation of California-only hazardous wastes and development of standards (regulations) that are equal to or, in some cases, more stringent than federal requirements.

	The California Environmental Protection Agency (Cal/EPA), Department of Toxic Substances Control (DTSC) administers and implements the provisions of the law at the state level. Certified Unified Program Agencies (CUPAs) implement some elements of the law at the local level.
Title 22, California Code of Regulations (CCR), Division 4.5 Environmental Health Standards for the Management of Hazardous Waste	These regulations establish requirements for the management and disposal of hazardous waste in accordance with the provisions of the California Hazardous Waste Control Act and federal RCRA. As with the federal requirements, waste generators must determine if their wastes are hazardous according to specified characteristics or lists of wastes. Hazardous waste generators must obtain identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Generator standards also include requirements for record keeping, reporting, packaging, and labeling. Additionally, while not a federal requirement, California requires that hazardous waste be transported by registered hazardous waste transporters. The standards addressed by Title 22, CCR include: • Identification and Listing of Hazardous Waste (Chapter 11, §§ 66261.1, et seq.) • Standards Applicable to Generators of Hazardous Waste (Chapter 12, §§ 66262.10, et seq.) • Standards Applicable to Transporters of Hazardous Waste (Chapter 13, §§ 66263.10, et seq.) • Standards for Universal Waste Management (Chapter 23, §§ 66273.1, et seq.) • Standards for the Management of Used Oil (Chapter 29, §§ 66279.1, et seq.) • Requirements for Units and Facilities Deemed to Have a Permit by Rule (Chapter 45, §§ 67450.1, et seq.) The Title 22 regulations are established and enforced at the state level by DTSC. Some generator standards are also enforced at the local level by CUPAs.
California Health and Safety Code, Chapter 6.11 §§ 25404–25404.9 Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program)	The Unified Program consolidates, coordinates, and makes consistent the administrative requirements, permits, inspections, and enforcement activities of the six environmental and emergency response programs listed below. • Aboveground Storage Tank Program • Business Plan Program • California Accidental Release Prevention (CalARP) Program • Hazardous Material Management Plan / Hazardous Material Inventory Statement Program • Hazardous Waste Generator / Tiered Permitting Program • Underground Storage Tank Program The state agencies responsible for these programs set the standards for their programs while local governments implement the standards. The local agencies implementing the Unified Program are known as CUPAs. Los Angeles County Department of Environmental Health is the area CUPA.

	Note: The Waste Management analysis only considers application of the Hazardous Waste Generator/Tiered Permitting element of the Unified Program. Other elements of the Unified Program may be addressed in the **Hazardous Materials** and/or **Worker Health and Safety** analysis sections.
Title 27, CCR, Division 1, Subdivision 4, Chapter 1, §§ 15100, et seq. Unified Hazardous Waste and Hazardous Materials Management Regulatory Program	While these regulations primarily address certification and implementation of the program by the local CUPAs, the regulations do contain specific reporting requirements for businesses. • Article 9 – Unified Program Standardized Forms and Formats (§§ 15400–15410). • Article 10 – Business Reporting to CUPAs (§§ 15600–15620).
Public Resources Code, Division 30, §§ 40000, et seq. California Integrated Waste Management Act of 1989.	The California Integrated Waste Management Act of 1989 (as amended) establishes mandates and standards for management of solid waste. Among other things, the law includes provisions addressing solid waste source reduction and recycling, standards for design and construction of municipal landfills, and programs for county waste management plans and local implementation of solid waste requirements.
Title 14, CCR, Division 7, § 17200, et seq. California Integrated Waste Management Board	These regulations further implement the provisions of the California Integrated Waste Management Act and set forth minimum standards for solid waste handling and disposal. The regulations include standards for solid waste management, as well as enforcement and program administration provisions. • Chapter 3 – Minimum Standards for Solid Waste Handling and Disposal. • Chapter 3.5 – Standards for Handling and Disposal of Asbestos Containing Waste. • Chapter 7 – Special Waste Standards. • Chapter 8 – Used Oil Recycling Program. • Chapter 8.2 – Electronic Waste Recovery and Recycling.
California Health and Safety Code, Division 20, Chapter 6.5, Article 11.9, §25244.12, et seq. Hazardous Waste Source Reduction and Management Review Act of 1989 (also known as SB 14).	This law was enacted to expand the state's hazardous waste source reduction activities. Among other things, it establishes hazardous waste source reduction review, planning, and reporting requirements for businesses that routinely generate more than 12,000 kilograms (~ 26,400 pounds) of hazardous waste in a designated reporting year. The review and planning elements are required to be done on a four-year cycle, with a summary progress report due to DTSC every fourth year.
Title 22, CCR, § 67100.1 et seq.	These regulations further clarify and implement the provisions of the Hazardous Waste Source Reduction and Management Review Act of 1989 (noted above). The regulations establish the specific review

Hazardous Waste Source Reduction and Management Review.	elements and reporting requirements to be completed by generators subject to the act.
California Health and Safety Code Section 101480 - 101490	These regulations authorize the Los Angeles County Department of Environmental Health to enter into voluntary agreements for the oversight of remedial action at sites contaminated by wastes.
Title 22, CCR, Chapter 32, §67383.1 – 67383.5	This chapter establishes minimum standards for the management of all underground and aboveground tank systems that held hazardous waste or hazardous materials, and are to be disposed, reclaimed or closed in place.
Title 8, CCR §1529 and §5208	These regulations require the proper removal of asbestos containing materials in all construction work and are enforced by California Occupational Safety and Health Administration (Cal-OSHA).
Title 27, CCR , division 2, Subdivision 1, Chapter 3, Subchapter 4,	This regulation establishes that alternative daily cover (ADC) and other waste materials beneficially used at landfills constitutes diversion through recycling, and requires the California Integrated Waste Management Board to adopt regulations governing ADC.
California Porter-Cologne Water Quality Control Act of 1952: California Water Code, Division 7, Title 23, CCR, Division 3, Chapter 9	Requires adequate protection of water quality by appropriate design, sizing and construction of erosion and sediment controls.
Local	
Los Angeles County Fire Department (LACOFD) Health Hazardous Materials Division (CUPA)	Regulates enforcement responsibility for the implementation of Title 23, Division 3, Chapters 16 and 18 of the CCR, as it relates to hazardous material storage and petroleum underground storage cleanup.
LACOFD Health Hazardous Materials Division	Regulates hazardous waste generator permitting and hazardous waste handling and storage.
Los Angeles County Department of Environmental Health, Hazardous Material Division various programs	Hazardous Material Division is the CUPA for Los Angeles County that regulates and conducts inspections of businesses that handle hazardous materials, hazardous wastes, and/or have underground storage tanks. Hazardous Material Division programs include assistance with oversight on property re-development (i.e., brownfields) and voluntary or private oversight cleanup assistance.
Los Angeles County Code Section 68.905	Incorporates by reference the California Health & Safety Code Division 20, Chapter 6.11 which requires the facility to operate as a unified program facility.
Los Angeles Air Pollution Control District Regulation	This rule requires the owner or operator of a demolition or renovation to submit an Asbestos Demolition or Renovation Operational Plan (Notice of Intention) at least 10 working days before any asbestos stripping or

XI, Subpart M – Rule 361.145	removal work begins (such as site preparation that would break up, dislodge or similarly disturb asbestos containing materials. A Notice of Intent is required for all demolition regardless of whether there is the presence of asbestos containing material.
South Coast Air Quality Management District Rule 1166. Volatile Organic Compound Emissions from decontamination of soil	This rule sets requirements to control the emission of Volatile Organic Compounds (VOC) from VOC-contaminated soil as a result of leakage from storage or transfer facilities, from accidental spillage, or other deposition.
Policies	
Los Angeles County Code – Chapter 20.87 Los Angeles Integrated Waste Management Construction and Demolition (C&D) Ordinance.	The C&D ordinance applies to all construction and renovation projects with a value in excess of $100,000.Applicants must submit a recycling and reuse plan demonstrating how they will divert at least 50% of all soil, rock and gravel, and at least 50% of all C&D debris, excluding inert material.

SETTING

Proposed Project

The proposed BP Watson project is an 85-megawatt (MW) natural gas-fired cogeneration facility (Watson 2009a, p. 3-1). The project would add a fifth train to the existing Watson Cogeneration Facility that was originally licensed by the Energy Commission. The cogeneration equipment would consist of one combustion turbine generator, one heat recovery steam generator, two new cooling tower cells, and associated support equipment.

The facility would be located in the City of Carson, Los Angeles County, California. The facility is surrounded by both the Watson Cogeneration Facility and the BP Carson Refinery. The project site, laydown area, and parking area are bounded by Wilmington Avenue and the Dominquez Channel; and occupy the area southeast of Wilmington Avenue and East 223rd Street on the San Pedro-Dominquez Land Grant of the San Bernardino Base and Meridian (Watson 2009a, Volume II ES-1).

The proposed project would be built on a 2.5 acre brown field site within a 21.7acre area that is within a 428-acre parcel described as Assessor's Parcel Number(APN) 7315-006-003 (Watson 2009a, page 1-3). An existing warehouse/maintenance shop would be removed as part of the project (Watson 2009a, page 5.14-1). A temporary 25-acre paved laydown, equipment staging and contractor parking site would be located one mile southeast of the project site. There are no off-site linear facilities associated with the project.

The demolition and construction activities associated with the BP Watson project would produce a variety of mixed nonhazardous wastes, such as soil, wood, metal, concrete, etc. Waste would be recycled where practical and non-recyclable waste would be deposited in a Class III landfill. The hazardous waste generated during this phase of the project would consist of used oils, universal wastes, solvents, and empty hazardous waste materials (Watson 2009a, § 5.14.4). Universal wastes are hazardous wastes that contain mercury, lead, cadmium, copper, and other substances hazardous to human and environmental health. Examples of universal wastes are batteries, fluorescent tubes, and some electronic devices.

Operation and maintenance of the project and associated facilities would generate a variety of wastes, including hazardous wastes. To control air pollutant emissions, the project's turbine units would use selective catalytic reduction and oxidation catalyst equipment and chemicals, which generate both solid and hazardous wastes.

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

This waste management analysis addresses: a) existing soil contamination on the project site associated with prior activities on or near the project site; and b) the impacts from the generation and management of wastes during demolition of existing structures and during project construction and operation.

a) For any site in California proposed for the construction of a power plant, the applicant must provide documentation about the nature of any potential or existing releases of hazardous substances or contamination at the site. If potential or existing releases or contamination at the site are identified, the significance of the release or contamination would be determined by site-specific factors, including, but not limited to: the amount and concentration of contaminants or contamination; the proposed use of the area where the contaminants/contamination is found; and any potential pathways for workers, the public, or sensitive species or environmental areas to be exposed to the contaminants. Any unmitigated contamination or releases of hazardous substances that pose a risk to human health or environmental receptors would be considered significant by Energy Commission staff.

   As a first step in documenting existing site conditions, the Energy Commission's power plant site certification regulations require that a Phase I Environmental Site Assessment (ESA) be prepared[1] and submitted as part of an application for certification. The Phase I ESA is conducted to identify any conditions indicative of releases or threatened releases of hazardous substances at the site and to identify any areas near the site that are known to be contaminated (or a source of contamination).

[1] Title 20, California Code of Regulations, section 1704(c) and Appendix B, section (g)(12)(A). Note that the Phase I ESA must be prepared according to American Society for Testing and Materials protocol or an equivalent method agreed upon by the applicant and the Energy Commission staff.

The Phase I ESA is conducted by a qualified environmental professional. It includes inquiries into past uses and ownership of the property, former hazardous substance releases and/or hazardous waste disposal at the site and within a certain distance of the site, and visual inspection of the property, and making observations about the potential for contamination and possible areas of concern. After conducting all necessary file reviews, interviews, and site observations, the environmental professional provides findings about the environmental conditions at the site. In addition, since the Phase I ESA does not include sampling or testing, the environmental professional may give an opinion about the potential need for any additional investigation. Additional investigation may be needed, for example, if there were significant gaps in the information available about the site, an ongoing release is suspected, or to confirm an existing environmental condition.

~~If additional investigation is needed to identify the extent of possible contamination, a Phase II ESA may be required. The Phase II ESA usually includes sampling and testing of potentially contaminated media to verify the level of contamination and the potential for remediation at the site.~~During the Project geotechnical assessment activities, soil samples will be collected in areas where ground disturbance is planned within the Project footprint, and analyzed to investigate the subsurface soils for petroleum hydrocarbon impacts. During the Project geotechnical assessment and during construction activities, any excavated soil will be managed pursuant to applicable BP Carson Refinery soils management plans, and health and safety of site personnel will be managed in accordance with the site-specific health and safety plan and applicable BP Carson Refinery procedures [Refer to Comment 4.13.1].

In conducting its assessment of a proposed project, Energy Commission staff review the project's Phase I ESA and work with the appropriate oversight agencies, as necessary, to determine if additional site characterization work is needed and if any mitigation is necessary at the site to ensure protection of human health and the environment from any hazardous substance releases or contamination identified.

b) Regarding the management of project-related wastes generated during demolition, construction and operation, staff reviews the applicant's proposed solid and hazardous waste management methods and determines if the methods proposed are consistent with the LORS identified for waste disposal and recycling. The federal, state, and local LORS represent a comprehensive regulatory system designed to protect human health and the environment from impacts associated with management of both non-hazardous and hazardous wastes. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management.

   Staff then reviews the capacity available at off-site treatment and disposal sites and determines whether or not the proposed power plant's waste would have a significant impact on the volume of waste a facility is permitted to accept. Staff uses a waste volume threshold equal to 10% of a disposal facility's remaining permitted capacity to determine if the impact from disposal of project wastes at a particular facility would be significant.

   In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of the BP Watson project have a combined remaining capacity in excess of 10 million cubic yards. The total amount of hazardous wastes generated by the BP Watson project would consume less than 0.02% of the remaining permitted capacity. Therefore, impacts from disposal of Watson Cogeneration generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Existing Site Conditions and Potential for Contamination

The proposed 2.5-acre project site is located adjacent to four operating cogeneration units in the maintenance area of the 428-acre BP Carson petroleum refinery parcel. The maintenance area was developed within the refinery retention basin, which was in operation from 1920 until 1987 (Watson 2009a Appendix A page ES-2). There are known and potential subsurface impacts associated with the current and historic refinery operations and maintenance operations at the BP Carson Refinery, including the proposed project site (Watson 2009a, page 5.14-2).

The BP Carson Refinery is under Cleanup and Abatement Orders (CAO) Numbers 84-17 and 90-121, issued in 1984 and 1990 respectively by the Los Angeles Regional Water Quality Control Board (LARWQCB) with Environmental Protection Agency (EPA) involvement (URS 2009e, Data Response 37 and 39). CAO 84-17 required operators of all 15 Los Angeles County petroleum chemical facilities to conduct subsurface investigations of their facilities to detect and assess any groundwater pollution which may be present. Later, the Regional Board required the Atlantic Richfield Company (the BP Refinery) to conduct further ground water cleanup and investigation at the refinery. CAO 90-121 required Atlantic Richfield Company (BP Carson Refinery) to cleanup and abate the ground water pollution caused by uncontrolled releases of hydrocarbon product from its Los Angeles County Refinery. The RWQCB issued the two orders per California Water Code (CWC) Sections 13260, 13267, 13304 and 13350 for investigation of contaminated soils and groundwater and their cleanup (Cho 2010a). The CAOs require adequate protection of water quality by appropriate design, sizing, and construction of erosion and sediment controls. The CAOs, which are still in effect, are designed to address all ground water and soil clean-up at the entire refinery (Cho 2010b), including the proposed project site.

There are known and potential subsurface impacts associated with the historic and current operations of the Watson Cogeneration Facility. A limited soil investigation was conducted on February 8, 1985 on the site where the proposed project would be built. It was reported that hydrocarbons were encountered in several borings within the fill soils and underlying natural soils (Watson 2009a, page 5.14-2). A Phase I ESA, dated January 20, 2009, was prepared by the URS Corporation for the applicant. The assessment was completed in accordance with the American Society for Testing and Materials Standard Practice E 1527-05 for ESAs (Watson 2009a, Appendix A). It identified a number of Recognized Environmental Conditions (REC). A REC is the presence or likely presence of any hazardous substances or petroleum products on a property under the conditions that indicate an existing release, past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property. The existing fill on the site may consist of a blend of non-hazardous and hazardous constituents.

Based on the known previous activity (retention basin and maintenance/operation area) on the proposed project site and the findings of the Phase I ESA, Energy Commission staff and Paul Cho of the LARWQCB both believe that a more detailed characterization of the existing soil at the project site is needed to ensure proper classification as non-hazardous or hazardous. The site investigations should include soil sampling and chemical analyses of the soil that would be excavated. Characterization of the 2.5 acre site should be carried out by the applicant as part of the various programs already in place at the refinery, which are required by state and federal regulations (URS 2009e, Data Response 37). The project owner shall insure that the soil will be disposed of in legal discharge areas and handled in accordance with the existing CAOs and applicable LORS.

The project site is currently covered with asphalt paving, and has a warehouse/maintenance shop with associated underground man-made structures, such as piping and tanks and possibly other unidentified structures. The asphalt and structures in the footprint of the project site would be demolished and removed prior to construction. The site would then be prepared for installation of foundations and underground facilities. The foundation excavations would require that approximately 7,000 cubic yards of existing fill material be removed, monitored, and handled according to regulatory requirements ~~and stockpiled~~ [Refer to Comment 4.13.2]. Excavated contaminated soils would be stored temporarily in construction zones and later removed off-site for disposal (URS 2009e, Data Response 37). Prior to excavation, the applicant would demonstrate how they would manage the contaminated soil, maintain compliance with regulatory requirements (Waste Management , Air Quality, Water Resources, and Worker Safety),and verify that there would be no human health risks associated with the movement of contaminated soil.

Staff has included Condition of Certification **WASTE-1** to require the applicant to sample and analyze soil to be excavated during construction to insure that it is properly classified as hazardous or nonhazardous~~.~~[2] and ensure applicable handling environmental compliance requirements are met. Condition of Certification **WASTE-2** would require that prior to initiating any earthwork on the project site; the project owner shall prepare and submit to the ~~LARWQCB, and to the~~ Compliance Project Manager (CPM) for approval, a Soils Management Plan to assure the proper handling, storage and disposal of contaminated soils [Refer to Comment 4.13.2]. Condition of Certification **WASTE-3** would require that an experienced and qualified Professional Engineer or Professional Geologist be available for consultation during site characterization, soil grading or soil excavation to determine appropriate actions to be taken in the event contaminated soil is encountered.

Conditions of Certification **WASTE -1** and **2**, and **WORKER SAFETY-1** and **2** would require the applicant to demonstrate how the project owner would manage the excavation of the contaminated soils in order to protect human health and the environment. These conditions would ensure the potential contamination is adequately characterized and the type and extent of contamination is quantified. They would also ensure that potential contaminated soils are appropriately disposed of and managed so that worker health and safety is protected and

[2] Prior to the excavation, a pre-assessment would be conducted to determine if the excavation will need to follow 40 CFR 63 Subpart GGGGG and Air Quality Management District Rule 1166 that regulate air emissions from excavation of soil contaminated with volatile organic compounds (Watson 2009a, page 5.4-7, Data Request 37).

potential environmental impacts are not exacerbated.

Demolition and Construction Impacts and Mitigation

Demolition of existing structures and construction of the proposed power plant and associated facilities would last approximately 26 months and generate both nonhazardous and hazardous wastes in solid and liquid forms (Watson 2009a, page 5.4-7). Before demolition and construction can begin, the project owner would be required to develop and implement a Demolition and Construction Waste Management Plan, per proposed Condition of Certification **WASTE-4**.

Non-Hazardous Wastes

All non-hazardous wastes would be recycled to the extent possible and non-recyclable wastes would be collected by a licensed hauler and disposed in a solid waste disposal facility, in accordance with Title 14, California Code of Regulations, section 17200 et seq. During demolition, approximately 1,120 tons of debris would be recycled and approximately one ton would be disposed of in a Class I or II landfill (Watson 2009a, page 5.14-8). During construction, as little as 20 cubic yards (estimate does not include amount of soil to be disposed of in landfill) of non-hazardous solid wastes would be generated. Construction waste would include scrap metal, wood, concrete, steel/metal, paper, glass, empty tanks, waste oil, and plastic waste (Watson 2009a, Table 5.14-2).

The Los Angeles County Integrated Waste Management Authority (IWMA) passed a construction and demolition (C&D) ordinance on January 4, 2005. The C&D ordinance applies to all construction and renovation projects with a value in excess of $100,000, all permits which consist of the demolition of a structure or structures, irrespective of the value of the demolition work, and all projects which consist only of grading, irrespective of the total value of the grading work. All applicants must submit a Recycling and Reuse Plan (RRP). The C&D requires that 50% of total debris generated by a project be recycled or reused. Permits would not be issued until the project has an approved RRP. (Los Angeles County Integrated Waste Management authority http://dpw.lacounty.gov/epd/cd). Adoption of Condition of Certification **WASTE-5** would ensure that the BP Watson project owner complies with the county's Construction and Demolition Debris Recycling and Reuse Program Ordinance, Chapter 20.87. Staff believes that compliance with proposed Condition of Certification **WASTE-5** would further reduce potential impacts to local landfills from project wastes.

Non-hazardous liquid wastes would also be generated during construction, including sanitary wastes, dust suppression drainage, and equipment wash water. Sanitary wastes would be collected in portable, self-contained toilets and pumped periodically for disposal at an appropriate facility. Potentially contaminated equipment wash water will be contained at designated wash areas and transported to a sanitary wastewater treatment facility (see the **Soil and Water Resources** section of this document for more information on the management of project wastewater).

Hazardous Wastes

Hazardous wastes that would likely be generated during construction include solvents, waste paint, oil absorbents, used oil, oily rags, batteries, cleaning wastes, spent welding materials, and empty hazardous material containers (Watson 2009a, Table 5.14-2). The total volume of hazardous wastes generated during construction is estimated by staff to be approximately 194 cubic yards.

The project owner would be required to obtain a unique hazardous waste generator identification number for the site prior to starting construction, pursuant to proposed Condition of Certification **WASTE-6.** Although the hazardous waste generator number is determined based on site location, both the construction contractor and the project owner/operator could be considered the generator of hazardous wastes at the site.

Wastes would be accumulated on site for less than 90 days and then properly manifested, transported, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies. Staff reviewed the disposal methods described in AFC section 5.14.2 and concluded that all wastes would be disposed of in accordance with all applicable LORS. Should any construction waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-7** to notify the Energy Commission's CPM whenever the owner becomes aware of any such action.

In the event that construction excavation, grading, or trenching activities for the proposed project encounter potentially contaminated soils that require specific handling, disposal and other precautions required pursuant to hazardous waste management LORS, staff finds that proposed Conditions of Certification **WASTE-2** and **WASTE-3** would be adequate to address such concerns. Absent any unusual circumstances, staff considers project compliance with LORS to be sufficient to ensure that no significant impacts would occur as a result of project waste management activities.

Operation Impacts and Mitigation

The proposed Watson Cogeneration facility would generate non-hazardous and hazardous wastes in both solid and liquid forms under normal operating conditions. Table 5.14-3 of the project AFC gives a summary of the operation waste streams, expected waste volumes and generation frequency, and management methods proposed. Before operations can begin, the project owner would be required to develop and implement an Operation Waste Management Plan pursuant to proposed Condition of Certification **WASTE-8**.

Non-Hazardous Solid Wastes

Operation of the project is expected to generate less than ten tons per year of non-hazardous solid wastes (not including filter cake). This would include routine maintenance wastes (such as used air filters, spent deionization resins, sand and filter media) as well as domestic and office wastes (such as office paper, newsprint, aluminum cans, plastic, and glass). All non-hazardous wastes would be recycled, to the extent possible, and non-recyclable wastes would be regularly transported off site to a local solid waste disposal facility (Watson 2009a § 5.14.2.2).

Non-Hazardous Liquid Wastes

Non-hazardous liquid wastes would be generated during facility operation and are discussed in the **Soil and Water Resources** section of this document.

Hazardous Wastes

The project owner/operator would be considered the generator of hazardous wastes at the site during facility operations. Therefore, the project owner's unique hazardous waste generator identification number, obtained prior to construction in accordance with proposed Condition of Certification **WASTE-6**, would be retained and used for the management of hazardous wastes generated during facility operation.

The generation of hazardous wastes expected during routine project operation includes used hydraulic fluids, oils, greases, oily filters and rags, spent selective catalytic reduction catalysts, cleaning solutions and solvents, and batteries. In addition, spills and unauthorized releases of hazardous materials or hazardous wastes may generate contaminated soils or materials that may require corrective action and management as hazardous waste. Proper hazardous materials handling and good housekeeping practices would help keep spilled wastes to a minimum. However, to ensure proper cleanup and management of any contaminated soils or waste materials generated from hazardous materials spills, staff proposes Condition of Certification **WASTE-9**, which would require the project owner/operator to report, clean up, and remediate as necessary, any hazardous materials spills or releases in accordance with all applicable federal, state, and local requirements. More information on hazardous material management, spill reporting, containment, and spill control and countermeasures plan provisions for the project are provided in the **Hazardous Materials Management** section of the PSA.

Less than twenty tons per year of hazardous wastes would be generated during the 30-year anticipated operation of the BP Watson facility, with source reduction and recycling of wastes implemented whenever possible. The hazardous wastes would be temporarily stored on site, transported off site by licensed hazardous waste haulers, and recycled or disposed of at authorized disposal facilities in accordance with established standards applicable to generators of hazardous waste (Title 22, CCR, §§ 66262.10 et seq.). Should any operations waste management-related enforcement action be taken or initiated by a regulatory agency, the project owner would be required by proposed Condition of Certification **WASTE-7** to notify the CPM whenever the owner becomes aware of any such action.

Impact on Existing Waste Disposal Facilities

Non-Hazardous Wastes

During demolition and construction of the proposed project, approximately 20 cubic yards of solid waste, and approximately eight tons per year of operation waste would be generated and recycled or disposed of in a Class III landfill (Watson 2009a, Table 5.14-3).

Table 5.14-1 of the project AFC presents details of six non-hazardous (Class III) waste disposal facilities that could potentially take the non-hazardous construction and operation wastes generated by the BP Watson project facility. These Class III landfills are all located in Southern California in Los Angeles County. The remaining capacity for the six landfills combined is over 49 million cubic yards. The total amount of non-hazardous waste generated from project construction and operation would contribute less than 1% of the available landfill capacity. Staff finds that disposal of the solid wastes generated by the BP Watson project facility can occur without significantly impacting the capacity or remaining life of any of these facilities.

Hazardous Wastes

Table 5.14-1 of the AFC displays information on the two Class I landfills in California: the Buttonwillow Landfill in Kern County, and the Kettleman Hills Landfill in King's County. The Kettleman Hills facility also accepts Class II and Class III wastes. Kettleman Hills and Buttonwillow landfills have a combined excess of 10 million cubic yards of remaining hazardous waste disposal capacity, with up to 33 years of remaining operating lifetimes (Watson 2009a, page 5.14-.3).

Hazardous wastes generated during construction and operation would be recycled to the extent possible and practical. Those wastes that cannot be recycled would be transported off site to a permitted treatment, storage, or disposal facility. Approximately 194 cubic yards of construction hazardous waste, and 12 cubic yards per year of operation hazardous waste would be generated from the BP Watson project facility. The volume of hazardous waste from the Watson Cogeneration facility requiring off-site disposal would be far less than staff's threshold of significance and would therefore not significantly impact the capacity or the remaining life of the Class I waste facilities.

CUMULATIVE IMPACTS AND MITIGATION

The CEQA Guidelines (Section 15355) define cumulative effects as "two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts." As noted in the **Land Use** Section, existing projects in the vicinity of the BP Watson project site include industrial facilities and uses. The city of Carson has identified two future projects in the vicinity of the project site: The Alameda Corridor Improvement Study and the Shell Specific Plan. In addition, the Housing Element Update project would affect the city as a whole. The Alameda Corridor is a 20-mile rail and traffic route linking the to the ports of Los Angeles and Long Beach to the transcontinental rail lines near downtown Los Angeles and borders the project site to the east. The Shell Specific Plan proposes the redevelopment of the 446-acre Shell Carson Terminal facility to permit development of additional product storage tanks and light industrial storage.

The proposed BP Watson project would be constructed on a site with four existing combustion turbine generators within a refinery and would be the same type of land use type as the existing on-site and adjacent uses. The proposed project would not require a General Plan amendment, zone change or a conditional use permit. Since the project is an allowable use at the proposed site, and would not result in significant adverse waste management impacts that cannot be mitigated, impacts from the BP Watson project facility would not likely combine with those from the projects being processed within the city to result in significant cumulative impacts. The proposed project would not make a significant contribution to regional impacts related to new development and growth. The project is planned to serve the existing and anticipated electrical needs of the region by connecting to the existing electric transmission system and other utility infrastructure. The waste management impacts of the proposed project, in combination with past, present and reasonably foreseeable projects in the area would not be cumulatively considerable.

As proposed, the amount of non-hazardous and hazardous wastes generated during construction and operation of the BP Watson project facility would add to the total quantity of waste generated in the State of California. Project non-hazardous wastes would be generated in modest quantities, approximately 18 cubic yards during construction, and eight cubic yards per year during operation (Watson Cogeneration 2009a page 5.14-18 and SR 2008e p. 5-40). On the other hand, one hundred and ninety-four cubic yards of hazardous waste would be generated during construction, and approximately 12 cubic yards per year would be generated during operation. Waste recycling would be employed wherever practical, and sufficient capacity is available at several treatment and disposal facilities to handle the volumes of wastes that would be generated by the project. Los Angeles County has 49 million cubic yards of volume remaining in their Class III landfills, and 10 million cubic yards available in the Class I landfills. The proposed Watson Cogeneration facility's contribution would be less than 1% of the county's waste generation. Therefore, staff concludes that the waste generated by the Watson Cogeneration facility would not result in significant cumulative waste management impacts.

COMPLIANCE WITH LORS

Energy Commission staff concludes that the proposed BP Watson project facility would comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during both facility construction and operation. The applicant is required to recycle and/or dispose hazardous and non-hazardous wastes at facilities licensed or otherwise approved to accept the wastes. Because hazardous wastes would be produced during both project construction and operation, the BP Watson Project facility would be required to obtain a hazardous waste generator identification number from U.S. EPA. The Watson Cogeneration facility would also be required to properly store, package, and label all hazardous waste; use only approved transporters; prepare hazardous waste manifests; keep detailed records; and appropriately train employees, in accordance with state and federal hazardous waste management requirements.

In the **Socioeconomics** section of this staff assessment, staff presents census information that shows that there are minority populations within one mile and six miles of the project. For the proposed Watson Cogeneration project, the total population within the six-mile radius of the site is 763,629 persons, and the total minority population is 604,924 persons or 79.21 % of the total population (see **Socioeconomics Figure 1**). Staff concludes that the BP Watson Project would not result in significant waste management impacts from construction or operation of the power plant on minority population if the proposed Conditions of Certification are implemented. Therefore, there are no environmental justice issues for Waste Management.

CONCLUSIONS

Consistent with the three main objectives for staff's waste management analysis (as noted in the Introduction section of this analysis), staff provides the following conclusions:

1) Based on its review of the applicant's proposed waste management procedures, staff concludes that project wastes would be managed in compliance with all applicable waste management LORS. Staff notes that both construction and operation wastes would be characterized and managed as either hazardous or non-hazardous waste. All non-hazardous wastes would be recycled to the extent feasible, and non-recyclable wastes would be collected by a licensed hauler and disposed of at a permitted solid waste disposal facility. Hazardous wastes would be accumulated onsite in accordance with

accumulation time limits (90,180, 270, or 365 days depending on waste type and volumes generated), and then properly manifested, transported to, and disposed of at a permitted hazardous waste management facility by licensed hazardous waste collection and disposal companies.

However, to help ensure and facilitate ongoing project compliance with LORS, staff proposes Conditions of Certification **WASTE-1** through **9**. These conditions would require the project owner to do all of the following:

- ~~Ensure the project site is investigated and any contamination identified is remediated, as necessary, with appropriate professional and regulatory agency oversight (**WASTE-1**, **2**, **3**, and **6**).~~[Refer to Comment 4.13.3]~~.~~
- Obtain a hazardous waste generator identification number (**WASTE-6**).
- Prepare a Demolition and Construction Waste Management Plan and an Operation Waste Management Plan that detail the types and volumes of wastes to be generated and how wastes would be managed, recycled, and/or disposed of after generation (**WASTE-4** and **8**).
- Report any waste management-related LORS enforcement actions and how violations would be corrected (**WASTE-7**).
- Comply with local waste recycling and diversion requirements (**WASTE-5**).
- Ensure that all spills or releases of hazardous substances are reported and cleaned up in accordance with all applicable federal, state, and local requirements (**WASTE-9)**.

2) Existing conditions at the BP Watson project site do include areas where prior site uses and/or demolition activities may have resulted in releases of hazardous substances or caused soil contamination. To ensure that the project site is investigated and remediated, as necessary, and to reduce any impacts from prior or future hazardous substance or hazardous waste releases at the site to a level of insignificance, staff proposes Conditions of Certification **WASTE-1**, **2**, **3**, **4**, **6**, and **9**. These conditions would require the project owner to ensure that the project site is investigated and remediated as necessary; demonstrate that project wastes are managed properly; and ensure that any future spills or releases of hazardous substances or wastes are properly reported, cleaned up, and remediated as necessary. Therefore, staff concludes that construction and operation of the proposed BP Watson project would not result in contamination or releases of hazardous substances that would pose a substantial risk to human health or the environment.

3) Regarding impacts of project wastes on existing waste disposal facilities, staff uses a waste volume threshold equal to 10% of a disposal facility's remaining capacity to determine if the impact from disposal of project wastes at a particular facility would be significant. The existing available capacity for the three Class III landfills that may be used to manage nonhazardous project wastes exceeds 87 million cubic yards. The total amount of nonhazardous wastes generated from construction and operation of the proposed BP Watson project would consume less than 0.1% of the remaining landfill capacity. Therefore, disposal of project generated non-hazardous wastes would have a less than significant impact on Class III landfill capacity.

In addition, the two Class I disposal facilities that could be used for hazardous wastes generated by the construction and operation of the BP Watson project have a combined remaining capacity in excess of 10 million cubic yards. The total amount of hazardous wastes generated by the BP Watson project would consume less than 0.02% of the remaining permitted capacity. Therefore, impacts from disposal of Watson Cogeneration generated hazardous wastes would also have a less than significant impact on the remaining capacity at Class I landfills.

PROPOSED CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall sample and analyze soil to be excavated during construction of the BP Watson project to ensure proper classification as hazardous or nonhazardous. In no event shall project construction commence in areas requiring characterization until the CPM has determined that all necessary testing and characterization has been accomplished.

Verification: At least 60 days prior to the start of site mobilization, the project owner shall provide to the CPM for review and approval the results of the soil sampling and analysis.

WASTE-2 Prior to initiating any earthwork on the project site, the project owner shall prepare and submit to the ~~Los Angeles Regional Water Quality Control Board, and to the~~ CPM for approval, a Soils Management Plan (SMP). The SMP should include but is not limited to the following:

- Land use history, including description and locations of known contamination;
- An earthwork schedule;
- The project owner shall describe methods which will be used to properly handle and/or dispose of soil which may be classified as hazardous or contain contaminants at levels of potential concern, including the identification of legal discharge areas;
- The SMP shall discuss, as necessary, the reuse of soil on site in accordance with applicable criteria to protect construction workers or future workers on site;
- ~~This SMP should be submitted to the Los Angeles Regional Water Quality Control Board as part of the cleanup plans required by Cleanup and Abatement Orders 84-17 and 90-121;~~
- A SMP summary report, which includes all analytical data and other findings, must be submitted once the earthwork has been completed.

Verification: At least 60 days prior to any earthwork, including those earthwork activities associated with the site mobilization, ground disturbance, or grading as defined in the general conditions of certification the project owner shall submit the Soils Management Plan to the ~~Los Angeles Regional Water Quality Control Board for review and comment, and to the~~ CPM for approval [Refer to Comment 4.13.2].

WASTE-3 The project owner shall provide the resume of an experienced and qualified professional engineer or professional geologist, who shall be available for consultation during site characterization (if needed), demolition, excavation, and grading activities, to the CPM for review and approval. The resume shall show experience in remedial investigation and feasibility studies.

The professional engineer or professional geologist shall be given full authority by the project owner to oversee any earth moving activities that have the potential to disturb contaminated soil, and to determine appropriate actions to be taken.

Verification: At least 30 days prior to the start of site mobilization, the project owner shall submit the resume to the CPM for review and approval.

WASTE-4 The project owner shall prepare a Demolition and Construction Waste Management Plan for all wastes generated during demolition of existing structures or construction of the facility and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- a description of all demolition and construction waste streams, including projections of frequency, amounts generated, and hazard classifications; and
- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans.

Verification: The project owner shall submit the Demolition and Construction Waste Management Plan to the CPM for approval no less than 30 days prior to the initiation of construction activities at the site.

WASTE-5 The project owner shall provide a Recycling and Reuse Plan demonstrating how they will divert at least 50% of all soil, rock and gravel, and at least 50%of all construction and demolition (C & D) debris, excluding inert material, to the Los Angeles County Integrated Waste Management Authority (IWMA) Construction and Demolition Debris Recycling and Reuse Program per Los Angeles County Code Chapter 20.87. The project owner shall ensure compliance with all of the county of Los Angeles' diversion program requirements and shall provide proof of compliance documentation to the county of Los Angeles and the CPM, including a Recycling and Reuse Summary Report, receipts, and records of measurement, consistent with the county of Los Angeles' normal reporting requirements.

Verification: Prior to the start of any construction activities, the project owner shall submit to the county of Los Angeles IWMA documentation consistent with the requirements of the County's C & D Debris Recycling and Reuse Program, along with the normally required deposit and administrative fees. At least 60 days prior to the start of any construction activities, the project owner shall submit the proposed C & D Debris Recycling and Reuse Plan, along with any comments received from the county of Los Angeles, to the CPM for review and approval. Project mobilization and construction shall not proceed until the County of Los Angeles issues an approval document, consistent with the county's normal building permit approval, and the CPM provides written concurrence. Not later than 60 days after completion of project construction, the project owner shall submit documentation of compliance with the diversion program requirements to the CPM and County of Los Angeles IWMA. The required documentation shall include a Recycling and Reuse Summary Report (as set forth by the county program), along with all necessary receipts and records of measurement from entities receiving project wastes.

WASTE-6 The project owner shall obtain a hazardous waste generator identification number from the United States Environmental Protection Agency (USEPA) prior to generating any hazardous waste during project construction and operations [Refer to Comment 4.13.4].

Verification: The project owner shall keep a copy of the identification number on file at the project site and provide documentation of the hazardous waste generation and notification and receipt of the number to the CPM in the next scheduled Monthly Compliance Report after receipt of the number. Submittal of the notification and issued number documentation to the CPM is only needed once unless there is a change in ownership, operation, waste generation, or waste characteristics that requires a new notification to USEPA. Documentation of any new or revised hazardous waste generation notifications or changes in identification number shall be provided to the CPM in the next scheduled compliance report.

WASTE-7 Upon becoming aware of any impending waste management-related enforcement action by any local, state, or federal authority, the project owner shall notify the CPM of any such action taken or proposed to be taken against the project itself, or against any waste hauler or disposal facility or treatment operator with which the owner contracts.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action. The CPM shall notify the project owner of any changes that will be required in the way project-related wastes are managed.

WASTE-8 The project owner shall prepare an Operation Waste Management Plan for all wastes generated during operation of the facility and shall submit the plan to the CPM for review and approval. The plan shall contain, at a minimum, the following:

- a detailed description of all operation and maintenance waste streams, including projections of amounts to be generated, frequency of generation, and waste hazard classifications;
- management methods to be used for each waste stream, including temporary on-site storage, housekeeping and best management practices to be employed, treatment methods and companies providing treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/source reduction plans;
- Information and summary records of conversations with the local Certified Unified Program Agency and the Department of Toxic Substances Control regarding any waste management requirements necessary for project activities. Copies of all required waste management permits, notices, and/or authorizations shall be included in the plan and updated as necessary;
- a detailed description of how facility wastes will be managed and any contingency plans to be employed in the event of an unplanned closure or planned temporary facility closure; and

- A detailed description of how facility wastes will be managed and disposed of upon closure of the facility.

<u>Verification:</u> The project owner shall submit the Operation Waste Management Plan to the CPM for approval no less than 30 days prior to the start of project operation. The project owner shall submit any required revisions to the CPM within 20 days of notification from the CPM that revisions are necessary.

The project owner shall also document in each Annual Compliance Report the actual volume of wastes generated and the waste management methods used during the year; provide a comparison of the actual waste generation and management methods used to those proposed in the original Operation Waste Management Plan; and update the Operation Waste Management Plan, as necessary, to address current waste generation and management practices.

WASTE-9 The project owner shall ensure that all spills or releases of hazardous substances, hazardous materials, or hazardous waste are documented and cleaned up and that wastes generated from the release/spill are properly managed and disposed of, in accordance with all applicable federal, state, and local requirements.

<u>Verification:</u> The project owner shall document management of all unauthorized releases and spills of hazardous substances, hazardous materials, or hazardous wastes that are in excess of EPA's reportable quantities (RQ), that occur on the project property or related linear facilities during construction and on the property during operation. The documentation shall include, at a minimum, the following information: location of release; date and time of release; reason for release; volume released; how release was managed and material cleaned up; amount of contaminated soil and/or cleanup wastes generated; if the release was reported; to whom the release was reported; release corrective action and cleanup requirements placed by regulating agencies; level of cleanup achieved and actions taken to prevent a similar release or spill; and disposition of any hazardous wastes and/or contaminated soils and materials that may have been generated by the release. A copy of the unauthorized release/spill documentation shall be provided to the CPM within 30 days of the date the release was discovered.

REFERENCES

CEC 2009h – California Energy Commission/Melissa Jones (TN: 51147). Data Adequacy Recommendation, dated 4/17/09. Submitted to CEC/Dockets Unit on 4/17/09.

CEC 2009q – California Energy Commission/Alan Solomon (TN: 53086). Data Request set 1 (1-39), dated 8/28/09. Submitted CEC/Docket Unit on 9/1/09.

CEC 2008ac – California Energy Commission/Alan Solomon (TN: 54390). CEC Data Request Set 2, dated 12/10/09. Submitted to CEC/Docket Unit on 12/10/09.

Cho 2010a - Cho, Paul, Los Angeles Regional Water Quality Control Board conversation and follow-up email to Ellie Townsend-Hough, dated 4/14/2010.

Cho 2010b - Cho, Paul, Los Angeles Regional Water Quality Control Board conversation and follow-up email to Ellie Townsend-Hough, dated 5/13/2010.

URS 2009b – URS Corp/ Cindy Kyle-Fisher (TN: 53444). Applicant's Data Responses to CEC Data Requests (1-39), dated 9/25/09. Submitted to CEC/Docket Unit on 9/28/09.

URS 2009e – URS Corp/Cindy Kyle-Fisher (TN 53800). Remainder of Applicant's Data Request Responses (1-39), dated 10/23/09. Submitted to CEC/Docket Unit on 10/26/09.

Watson 2009a- Watson Cogeneration Company/Thomas A. Lu (TN: 50584). Application for Certification Volume I & II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09. -

Watson 2009e- Watson Cogeneration Company/Thomas A. Lu (TN: 52187). Supplement in Response to CEC Data Adequacy Review, dated 6/29/09. Submitted to CEC/Docket Unit on 6/29/09.

FACILITY DESIGN

Shahab Khoshmashrab

SUMMARY OF CONCLUSIONS

The California Energy Commission staff (staff) concludes that the design, construction, and eventual closure of the project and its linear facilities would likely comply with applicable engineering laws, ordinances, regulations and standards. The proposed conditions of certification, below, would ensure compliance with these laws, ordinances, regulations and standards.

INTRODUCTION

Facility design encompasses the civil, structural, mechanical, and electrical engineering design of the Watson Cogeneration Steam and Electric Reliability project. The purpose of this analysis is to:

- Verify that the laws, ordinances, regulations and standards (LORS) that apply to the engineering design and construction of the project have been identified;
- Verify that both the project and its ancillary facilities are sufficiently described, including proposed design criteria and analysis methods, in order to provide reasonable assurance that the project will be designed and constructed in accordance with all applicable engineering LORS, in a manner that also ensures the public health and safety;
- Determine whether special design features should be considered during final design to address conditions unique to the site which could influence public health and safety; and
- Describe the design review and construction inspection process and establish the conditions of certification used to monitor and ensure compliance with the engineering LORS, in addition to any special design requirements.

Subjects discussed in this analysis include:

- Identification of the engineering LORS that apply to facility design;
- Evaluation of the applicant’s proposed design criteria, including identification of criteria essential to public health and safety;
- Proposed modifications and additions to the application for certification (AFC) necessary for compliance with applicable engineering LORS; and
- Conditions of certification proposed by staff to ensure that the project will be designed and constructed to ensure public health and safety and comply with all applicable engineering LORS.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Lists of LORS applicable to each engineering discipline (civil, structural, mechanical, and electrical) are described in the AFC (Watson 2009a, Appendices C through G). Key LORS are listed in **Facility Design Table 1,** below:

Facility Design Table 1
Key Engineering Laws, Ordinances, Regulations and Standards (LORS)

Applicable LORS	Description
Federal	Title 29 Code of Federal Regulations (CFR), Part 1910, Occupational Safety and Health standards
State	2007 (or the latest edition in effect) California Building Standards Code (CBSC) (also known as Title 24, California Code of Regulations)
Local	City of Carson regulations and ordinances
General	American National Standards Institute (ANSI) American Society of Mechanical Engineers (ASME) American Welding Society (AWS) American Society for Testing and Materials (ASTM)

SETTING

Watson Cogeneration Steam and Electric Reliability project (BP Watson) would be built on a site that is located in the City of Carson, California, and lies in a seismically active region. For more information about the site's seismic setting, please see the **Geology and Paleontology** section of this document. Also, for more information on the site and its related project description, please see the **Project Description** section of this document. Additional engineering design details are contained in the AFC, Appendices C through G (Watson 2009a).

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

The purpose of this analysis is to ensure that the project would be built to applicable engineering codes and ensure public health and life safety. This analysis further verifies that applicable engineering LORS have been identified and that the project and its ancillary facilities have been described in adequate detail. It also evaluates the applicant's proposed design criteria, describes the design review and construction inspection process, and establishes conditions of certification that would monitor and ensure compliance with engineering LORS and any other special design requirements. These conditions allow both the California Energy Commission (Energy Commission) compliance project manager (CPM) and the applicant to adopt a compliance monitoring scheme that will verify compliance with these LORS.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access, in addition to the criteria for designing and constructing linear support facilities such as natural gas and electric transmission interconnections. The applicant proposes the use of accepted industry standards (see

Watson 2009a, Appendices C through G, for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that this project, including its linear facilities, would most likely comply with all applicable site preparation LORS, and proposes conditions of certification (see below and the **Geology and Paleontology** section of this document) to ensure that compliance.

MAJOR STRUCTURES, SYSTEMS, AND EQUIPMENT

Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. See Condition of Certification **GEN-2**, below.

The BP Watson project shall be designed and constructed to the 2007 California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and other applicable codes and standards in effect when the design and construction of the project actually begin. If the initial designs are submitted to the chief building official (CBO) for review and approval after the update to the 2007 CBSC takes effect, the 2007 CBSC provisions shall be replaced with the updated provisions.

In order to ensure that structures are analyzed according to their appropriate lateral force procedure, staff has included Condition of Certification **STRUC-1**, below, which, in part, requires the project CBO’s review and approval of the owner’s proposed lateral force procedures before construction begins.

Major structures as defined above, also include enclosures, tanks, pipes, gas lines, waterlines, septic systems, grading, and are required to comply with the engineering codes adopted by the State of California. Exempt work is listed under Section 105.2 in Appendix Chapter 1 of the CBC.

PROJECT QUALITY PROCEDURES

The project’s AFC (Watson 2009a, Appendices C through G) describes a quality program intended to inspire confidence that its systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with all appropriate power plant technical codes and standards. Compliance with design requirements will be verified through specific inspections and audits. Implementation of this quality assurance/quality control (QA/QC) program will ensure that the BP Watson project is actually designed, procured, fabricated, and installed as described in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the CBO is authorized and directed to enforce all provisions of the CBC. The Energy Commission itself serves as the building official, and has the responsibility to enforce the code, for all of the energy facilities it certifies. In addition, the Energy Commission has the power to interpret the CBC and adopt and enforce both rules and supplemental regulations that clarify application of the CBC's provisions.

The Energy Commission's design review and construction inspection process conforms to CBC requirements and ensures that all facility design conditions of certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to perform design review and construction inspections and act as delegate CBOs on behalf of the Energy Commission. These delegates typically include the local building official and/or independent consultants hired to provide technical expertise that is not provided by the local official alone. The applicant, through permit fees provided by the CBC, pays the cost of these reviews and inspections. While building permits in addition to Energy Commission certification are not required for this project, the applicant pays in lieu of CBC permit fees to cover the costs of these reviews and inspections.

Engineering and compliance staff will invite the City of Carson or a third-party engineering consultant to act as CBO for this project. When an entity has been assigned CBO duties, Energy Commission staff will complete a memorandum of understanding (MOU) with that entity to outline both its roles and responsibilities and those of its subcontractors and delegates.

Staff has developed proposed conditions of certification to ensure public health and safety and compliance with engineering design LORS. Some of these conditions address the roles, responsibilities, and qualifications of the engineers who will design and build the proposed project (Conditions of Certification **GEN-1** through **GEN-8**). These engineers must be registered in California and sign and stamp every submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that every element of the project's construction (subject to CBO review and approval) be approved by the CBO before it is performed. Items exempt from this requirement are listed in Section 105.2 of Appendix Chapter 1 of the CBC. They also require that qualified special inspectors perform or oversee special inspections required by all applicable LORS.

The Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities on a case by case basis. The Energy Commission and the CBO also have the authority to interpret and accept alternate methods of construction and alternate materials.

FACILITY CLOSURE

The removal of a facility from service (decommissioning) when it reaches the end of its useful life ranges from "mothballing," to the removal of all equipment and appurtenant facilities and subsequent restoration of the site. Future conditions that could affect decommissioning are largely unknown at this time.

In order to ensure that decommissioning will be completed in a manner that is environmentally sound, safe, and protects the public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval before the project's decommissioning begins. The plan shall include a discussion of:

- Proposed decommissioning activities for the project and all appurtenant facilities that were constructed as part of the project;
- All applicable LORS, local/regional plans, and proof of adherence to those applicable LORS and local/regional plans;
- The activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- Decommissioning alternatives other than complete site restoration.

Satisfying the above requirements should serve as adequate protection, even in the unlikely event that the project is abandoned. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure Plan.

CONCLUSIONS AND RECOMMENDATIONS

1. The laws, ordinances, regulations and standards (LORS) identified in the AFC and supporting documents directly apply to the project.

2. Staff has evaluated the proposed engineering LORS, design criteria, and design methods in the record, and concludes that the design, construction, and eventual closure of the project will likely comply with applicable engineering LORS.

3. The proposed conditions of certification will ensure that BP Watson is designed and constructed in accordance with applicable engineering LORS. This will be accomplished through design review, plan checking, and field inspections that will be performed by the CBO or other Energy Commission delegate. Staff will audit the CBO to ensure satisfactory performance.

4. Though future conditions that could affect decommissioning are largely unknown at this time, it can reasonably be concluded that if, the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to decommissioning, decommissioning procedures will comply with all applicable engineering LORS.

Energy Commission staff recommends that:

1. The proposed conditions of certification be adopted to ensure that the project is designed and constructed in a manner that protects the public health and safety and complies with all applicable engineering LORS;

2. The project be designed and built to the 2007 CBSC (or successor standards, if in effect when initial project engineering designs are submitted for review) and other applicable codes adopted by the State of California; and

3. The CBO reviews the final designs, checks plans, and performs field inspections during construction. Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct, and inspect the project in accordance with the 2007 (or the latest edition in effect when initial project engineering designs are submitted for review) California Building Standards Code (CBSC), also known as Title 24, California Code of Regulations, which encompasses the California Building Code (CBC), California Building Standards Administrative Code, California Electrical Code, California Mechanical Code, California Plumbing Code, California Energy Code, California Fire Code, California Code for Building Conservation, California Reference Standards Code, and all other applicable engineering LORS in effect at the time initial design plans are submitted to the CBO for review and approval (the CBSC in effect is the edition that has been adopted by the California Building Standards Commission and published at least 180 days previously). The project owner shall ensure that all the provisions of the above applicable codes are enforced during the construction, addition, alteration, moving, demolition, repair, or maintenance of the completed facility. All transmission facilities (lines, switchyards, switching stations and substations) are covered in the conditions of certification in the **Transmission System Engineering** section of this document.

In the event that the initial engineering designs are submitted to the CBO when the successor to the 2007 CBSC is in effect, the 2007 CBSC provisions shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

The project owner shall ensure that all contracts with contractors, subcontractors, and suppliers clearly specify that all work performed and materials supplied comply with the codes listed above.

Then project owner shall submit plans, calculations and other related documents that have been specifically developed for the BP Watson project

Verification: Five (5) days prior to requesting the issuance of the certificate of occupancy, the project owner shall submit to the CPM and the CBO a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation, and inspection requirements of the applicable LORS and the Energy Commission's decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the certificate of occupancy within 30 days of receipt from the CBO.

Once the certificate of occupancy has been issued, the project owner shall inform the CPM at least 30 days prior to any construction, addition, alteration, moving, demolition, repair, or maintenance to be performed on any portion(s) of the completed facility that requires CBO approval for compliance with the above codes. The CPM will then determine if the CBO needs to approve the work.

GEN-2 Before submitting the initial engineering designs for CBO review, the project owner shall furnish the CPM and the CBO with a schedule of facility design submittals, and master drawings and master specifications list. The master drawings and master specifications list shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures, systems, and equipment. Major structures, systems, and equipment are structures and their associated components or equipment that are necessary for power production, costly or time consuming to repair or replace, are used for the storage, containment, or handling of hazardous or toxic materials, or could become potential health and safety hazards if not constructed according to applicable engineering LORS. The schedule shall contain the planned date of each submittal to the CBO. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM upon request. In addition to the design submittals referenced above, plans and calculations for all construction work shall be submitted to the CBO for approval.

Verification: At least 60 days (or a project owner- and CBO-approved alternative time frame) prior to the start of the demolition of the existing structures, the project owner shall submit to the CBO and to the CPM the schedule, and the master drawings and master specifications list of documents to be submitted to the CBO for review and approval. These documents shall be the pertinent design documents for the major structures, systems, and equipment defined above in Condition of Certification **GEN-2**. Major structures and equipment shall be added to or deleted from the list only with CPM approval. The project owner shall provide schedule updates in the monthly compliance report.

GEN-3 The project owner shall make payments to the CBO for design review, plan checks, and construction inspections, based upon a reasonable fee schedule to be negotiated between the project owner and the CBO. These fees may be based on hourly rates or the valuation of the facilities reviewed, or may be otherwise agreed upon by the project owner and the CBO. A copy of the contract between the owner and the CBO shall be submitted to the CPM for review and approval by staff.

Verification: The project owner shall make the required payments to the CBO in accordance with the agreement between the project owner and the CBO. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next monthly compliance report indicating that applicable fees have been paid. The CBO shall inform the CPM if the project owner has not met its obligations as specified in the agreement between the project owner and the CBO for payments related to CBO services.

GEN-4 Prior to the start of demolition, the project owner shall assign a California-registered architect, or a structural or civil engineer, as the resident engineer (RE) in charge of the project. All transmission facilities (lines, switchyards, switching stations, and substations) are addressed in the conditions of certification in the **Transmission System Engineering** section of this document.

The RE shall be aware of construction activities at the project site at all times. However, he/she is not required to be physically present at the job site as long as the construction work is being performed as delegated below. The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical, plumbing, and electrical portions of the project, respectively. A registered civil engineer may be delegated responsibility for civil engineering aspects of the project such as grading, storm water pollution prevention practices (SWPPP), storm water management practices (SWMP), drainage, erosion, sedimentation control programs (DESCP) and similar aspects of civil engineering. A project may be divided into parts, provided that each part is clearly defined as a distinct unit. Separate assignments of general responsibility may be made for each designated part.

The RE or his/her delegate shall:

1. Monitor progress of construction work requiring CBO design review and inspection to ensure compliance with LORS;
2. Ensure that construction of all facilities subject to CBO design review and inspection conforms in every material respect to applicable LORS, these conditions of certification, approved plans, and specifications;
3. Prepare documents to initiate changes in approved drawings and specifications when either directed by the project owner or as required by the conditions of the project;
4. Be responsible for providing project inspectors and testing agencies with complete and up-to-date sets of stamped drawings, plans, specifications, and any other required documents;
5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition

of items noted on laboratory reports or other tests when they do not conform to CBO-approved plans and specifications.

The resident engineer (or his delegate) must be located at the project site, or be available at the project site within a reasonable period of time, during any hours in which construction takes place.

The RE shall have the authority to halt construction and to require changes or remedial work if the work does not meet requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of demolition, the project owner shall submit to the CBO for review and approval, the resume and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) is subsequently reassigned or replaced, the project owner has five days to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of demolition, the project owner shall assign at least one of each of the following California registered engineers to the project: a civil engineer; a soils, geotechnical, or civil engineer experienced and knowledgeable in the practice of soils engineering; and an engineering geologist. Prior to the start of construction, the project owner shall assign at least one of each of the following California registered engineers to the project: a design engineer who is either a structural engineer or a civil engineer fully competent and proficient in the design of power plant structures and equipment supports; a mechanical engineer; and an electrical engineer. (California Business and Professions Code section 6704 et seq., and sections 6730, 6731 and 6736 require state registration to practice as a civil engineer or structural engineer in California). All transmission facilities (lines, switchyards, switching stations, and substations) are handled in the conditions of certification in the **Transmission System Engineering** section of this document.

The tasks performed by the civil, mechanical, electrical, or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (for example, proposed earthwork, civil structures, power plant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

The project owner shall submit, to the CBO for review and approval, the names, qualifications, and registration numbers of all responsible engineers assigned to the project.

If any one of the designated responsible engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned responsible engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

A. The civil engineer shall:

   1. Review the foundation investigations, geotechnical, or soils reports prepared by the soils engineer, the geotechnical engineer, or by a civil engineer experienced and knowledgeable in the practice of soils engineering;

   2. Design (or be responsible for the design of), stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities requiring design review and inspection by the CBO. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads and sanitary sewer systems; and

   3. Provide consultation to the RE during the construction phase of the project and recommend changes in the design of the civil works facilities and changes to the construction procedures.

   4. Review, implement and monitor storm water pollution prevention practices (SWPPP).

   5. Review, implement and monitor storm water management practices (SWMP).

   6. Review, implement and monitor drainage, erosion, sedimentation control programs (DESCP).

   7. Review, implement and monitor all other civil engineering (earthwork) aspects of the project.

B. The soils engineer, geotechnical engineer, or civil engineer experienced and knowledgeable in the practice of soils engineering, shall:

   1. Review all the engineering geology reports;

   2. Prepare the foundation investigations, geotechnical, or soils reports containing field exploration reports, laboratory tests, and engineering analysis detailing the nature and extent of the soils that could be

susceptible to liquefaction, rapid settlement or collapse when saturated under load;

3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with requirements set forth in the CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both); and

4. Recommend field changes to the civil engineer and RE.

This engineer shall be authorized to halt earthwork and to require changes if site conditions are unsafe or do not conform to the predicted conditions used as the basis for design of earthwork or foundations.

C. The engineering geologist shall:

1. Review all the engineering geology reports and prepare a final soils grading report; and

2. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the CBC (depending on the site conditions, this may be the responsibility of either the soils engineer, the engineering geologist, or both).

D. The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;

2. Provide consultation to the RE during design and construction of the project;

3. Monitor construction progress to ensure compliance with engineering LORS;

4. Evaluate and recommend necessary changes in design; and

5. Prepare and sign all major building plans, specifications, and calculations.

E. The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform to all of the mechanical engineering design requirements set forth in the Energy Commission's decision.

F. The electrical engineer shall:

1. Be responsible for the electrical design of the project; and

2. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of demolition, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible civil engineer, soils (geotechnical) engineer and engineering geologist assigned to the project.

At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction, the project owner shall submit to the CBO for review and approval, resumes and registration numbers of the responsible design engineer, mechanical engineer, and electrical engineer assigned to the project.

The project owner shall notify the CPM of the CBO's approvals of the responsible engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the resume and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO’s approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, including prefabricated assemblies, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the applicable edition of the CBC. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A certified welding inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;

2. Inspect the work assigned for conformance with the approved design drawings and specifications;

3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and

4. Submit a final signed report to the RE, CBO, and CPM, stating whether

the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans, specifications, and other provisions of the applicable edition of the CBC.

Verification: At least 15 days (or project owner- and CBO-approved alternative time frame) prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next monthly compliance report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 If any discrepancy in design and/or construction is discovered in any engineering work that has undergone CBO design review and approval, the project owner shall document the discrepancy and recommend required corrective actions. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this condition of certification and, if appropriate, applicable sections of the CBC and/or other LORS.

Verification: The project owner shall transmit a copy of the CBO's approval of any corrective action taken to resolve a discrepancy to the CPM in the next monthly compliance report. If any corrective action is disapproved, the project owner shall advise the CPM, within five days, of the reason for disapproval and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work that has undergone CBO design review and approval. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. The project owner shall notify the CPM after obtaining the CBO's final approval. The project owner shall retain one set of approved engineering plans, specifications, and calculations (including all approved changes) at the project site or at another accessible location during the operating life of the project. Electronic copies of the approved plans, specifications, calculations, and marked-up as-builts shall be provided to the CBO for retention by the CPM.

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, in the next monthly compliance report, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans. After storing the final approved engineering plans, specifications, and calculations described above, the project owner shall submit to the CPM a letter stating both that the above documents have been stored and the storage location of those documents.

Within 90 days of the completion of construction, the project owner shall provide to the

CBO three sets of electronic copies of the above documents at the project owner's expense. These are to be provided in the form of "read only" (Adobe) files, with restricted (password-protected) printing privileges, on archive quality compact discs.

CIVIL-1 The project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. An storm water pollution prevention plan (SWPPP);
4. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
5. Soils, geotechnical, or foundation investigations reports required by the CBC.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of site grading the project owner shall submit the documents described above to the CBO for design review and approval. In the next monthly compliance report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible soils engineer, geotechnical engineer, or the civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications, and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area.

Verification: The project owner shall notify the CPM within 24 hours, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within 24 hours of the CBO's approval to resume earthwork and construction in the affected areas, the project owner shall provide to the CPM a copy of the CBO's approval.

CIVIL-3 The project owner shall perform inspections in accordance with the CBC. All plant site-grading operations, for which a grading permit is required, shall be subject to inspection by the CBO.

If, in the course of inspection, it is discovered that the work is not being performed in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report, with copies to the CBO and the CPM, detailing all discrepancies, non-compliance items, and the proposed corrective action.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a non-conformance report (NCR), and the proposed corrective action for review and approval. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following monthly compliance report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage work, the project owner shall obtain the CBO's approval of the final grading plans (including final changes) for the erosion and sedimentation control work. The civil engineer shall state that the work within his/her area of responsibility was done in accordance with the final approved plans.

Verification: Within 30 days (or project owner- and CBO-approved alternative time frame) of the completion of the erosion and sediment control mitigation and drainage work, the project owner shall submit to the CBO, for review and approval, the final grading plans (including final changes) and the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes, along with a copy of the transmittal letter to the CPM. The project owner shall submit a copy of the CBO's approval to the CPM in the next monthly compliance report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit plans, calculations and other supporting documentation to the CBO for design review and acceptance for all project structures and equipment identified in the CBO-approved master drawing and master specifications list. The design plans and calculations shall include the lateral force procedures and details as well as vertical calculations.

Construction of any structure or component shall not begin until the CBO has approved the lateral force procedures to be employed in designing that structure or component.

The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;

2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (for example, highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications;

3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation;

4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations, and specifications shall be signed and stamped by the responsible design engineer; and

5. Submit to the CBO the responsible design engineer's signed statement that the final design plans conform to applicable LORS.

<u>Verification:</u> At least 60 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of construction of any structure or component listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO the above final design plans, specifications and calculations, with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM, in the next monthly compliance report, a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and comply with the requirements set forth in applicable engineering LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following documents related to work that has undergone CBO design review and approval:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);

2. Concrete pour sign-off sheets;

3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);

4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and

5. Reports covering other structural activities requiring special inspections shall be in accordance with the CBC.

<u>Verification:</u> If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies and the proposed corrective action to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the condition(s) of certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the CBC, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give to the CBO prior notice of the intended filing.

Verification: ~~On a schedule suitable to the CBO, the~~The project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the CPM [Refer to Comment 5.1.1]. The project owner shall notify the CPM, via the monthly compliance report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in the CBC shall, at a minimum, be designed to comply with the requirements of that chapter.

Verification: At least 30 days (or project owner- and CBO-approved alternate time frame) prior to the start of installation of the tanks or vessels containing the above specified quantities of toxic or hazardous materials, the project owner shall submit to the CBO for design review and approval final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following monthly compliance report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the monthly compliance report following completion of any inspection.

MECH-1 The project owner shall submit, for CBO design review and approval, the proposed final design, specifications and calculations for each plant major piping and plumbing system listed in the CBO-approved master drawing and master specifications list. The submittal shall also include the applicable QA/QC procedures. Upon completion of construction of any such major piping or plumbing system, the project owner shall request the CBO's inspection approval of that construction.

The responsible mechanical engineer shall stamp and sign all plans, drawings, and calculations for the major piping and plumbing systems, subject to CBO design review and approval, and submit a signed statement to the CBO when the proposed piping and plumbing systems have been designed, fabricated, and installed in accordance with all of the applicable laws, ordinances, regulations and industry standards, which may include, but are not limited to:

- American National Standards Institute (ANSI) B31.1 (Power Piping Code);

- ANSI B31.2 (Fuel Gas Piping Code);
- ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);
- ANSI B31.8 (Gas Transmission and Distribution Piping Code);
- Title 24, California Code of Regulations, Part 5 (California Plumbing Code);
- Title 24, California Code of Regulations, Part 6 (California Energy Code, for building energy conservation systems and temperature control and ventilation systems);
- Title 24, California Code of Regulations, Part 2 (California Building Code); and
- City of Carson codes.

The CBO may deputize inspectors to carry out the functions of the code enforcement agency.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of any increment of major piping or plumbing construction listed in the CBO-approved master drawing and master specifications list, the project owner shall submit to the CBO for design review and approval the final plans, specifications, and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's inspection approvals.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of that installation.

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated, and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and

2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications, and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for design review and approval, the above listed documents, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall transmit to the CPM, in the monthly compliance report following completion of any inspection, a copy of the transmittal letter conveying the CBO's and/or Cal-OSHA inspection approvals.

MECH-3 The project owner shall submit to the CBO for design review and approval the design plans, specifications, calculations, and quality control procedures for any heating, ventilating, air conditioning (HVAC) or refrigeration system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the CBC and other applicable codes. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of that construction. The final plans, specifications and calculations shall include approved criteria, assumptions, and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans, and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the CBC and other applicable codes, with a copy of the transmittal letter to the CPM.

ELEC-1 Prior to the start of any increment of electrical construction for all electrical equipment and systems 480 Volts or higher (see a representative list, below), with the exception of underground duct work and any physical layout drawings and drawings not related to code compliance and life safety, the project owner shall submit, for CBO design review and approval, the proposed final design, specifications, and calculations. Upon approval, the above listed plans, together with design changes and design change notices, shall remain on the site or at another accessible location for the operating life of the project. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in conditions of certification in the **Transmission System Engineering** section of this document.

A. Final plant design plans shall include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems; and
2. system grounding drawings.

B. Final plant calculations must establish:
   1. short-circuit ratings of plant equipment;
   2. ampacity of feeder cables;
   3. voltage drop in feeder cables;
   4. system grounding requirements;
   5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
   6. system grounding requirements; and
   7. lighting energy calculations.

C. The following activities shall be reported to the CPM in the monthly compliance report:
   1. Receipt or delay of major electrical equipment;
   2. Testing or energization of major electrical equipment; and
   3. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission decision.

Verification: At least 30 days (or project owner- and CBO-approved alternative time frame) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for design review and approval the above listed documents. The project owner shall include in this submittal a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and shall send the CPM a copy of the transmittal letter in the next monthly compliance report.

REFERENCES

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application for Certification, Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

GEOLOGY AND PALEONTOLOGY

Dal Hunter, Ph.D., C.E.G.

SUMMARY OF CONCLUSIONS

The proposed Watson Cogeneration Steam and Electric Reliability project would be located in a geologically active area of Los Angeles County, Southern California. The project would be constructed in an area zoned for industrial development by the City of Carson. Because of its geologic setting, the site could be subject to intense levels of earthquake-related ground shaking. While the potential for earthquake ground rupture is low, at least 36 known, major, on-shore and off-shore faults are located within 62 miles (100 kilometers) of the site. The effects of strong ground shaking would need to be mitigated through structural designs required by the California Building Code (CBC, 2007). The California Building Code (2007) requires that structures be designed to resist seismic stresses from ground acceleration and, to a lesser extent, liquefaction. While earthquake damage to a building may be extensive, the intent is to prevent structural collapse and loss of life. The design-level geotechnical investigation required for the project by the California Building Code, and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**, should present standard engineering design recommendations for mitigation of potential expansive clay soils, as well as excessive settlement due to compressible soils or dynamic compaction.

There are no known viable geologic or mineralogical resources at the proposed Watson Cogeneration Steam and Electric Reliability project site. Paleontological resources have been documented in older Quaternary sediments within 1 mile of the site, but no significant fossils were found during field evaluations at the plant site or near ancillary facilities. Potential impacts to paleontological resources due to construction activities would be mitigated through worker training and monitoring by qualified paleontologists, as required by Conditions of Certification, **PAL-1** through **PAL-7**.

Based on its independent research and review, the California Energy Commission staff believes that the potential is low for significant adverse cumulative impacts to the project from geologic hazards during its design life and to potential geologic, mineralogic, and paleontologic resources from the construction, operation, and closure of the proposed project. It is California Energy Commission staff's opinion that the proposed Watson Cogeneration Steam and Electric Reliability project can be designed and constructed in accordance with all applicable laws, ordinances, regulations, and standards (LORS), and in a manner that both protects environmental quality and assures public safety.

INTRODUCTION

In this section, California Energy Commission staff (staff) discusses the potential impacts of geologic hazards on the proposed project as well as the Watson Cogeneration Steam and Electric Reliability (BP Watson) project impact on geologic, mineralogic, and paleontologic resources. Staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources during the project construction, operation, and closure and that operation of the plant would not expose occupants to high-probability geologic hazards. A brief geological and paleontological overview and assessment of potential impacts are provided. The section concludes with staff's proposed monitoring and mitigation measures for geologic hazards and geologic, mineralogic, and palentologic resources, with the proposed conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Applicable LORS are listed in the application for certification (AFC) (Watson 2009a). The following briefly describes the current LORS for both geologic hazards and resources and mineralogic and paleontologic resources.

Geology and Paleontology Table 1
Laws, Ordinances, Regulations, and Standards (LORS)

Applicable Law	Description
Federal	The proposed BP Watson is not located on federal land. There are no federal LORS for geologic hazards and resources for this site.
State	
California Building Code (2007) in CCR Title 24	The CBC (2007) includes a series of standards that are used in project investigation, design, and construction (including grading and erosion control). The CBC has adopted provisions in the International Building Code (ICC, 2006). The International Code Council authors the International Building Code.
Alquist-Priolo Earthquake Fault Zoning Act, Public Resources Code (PRC), section 2621–2630	Mitigates against surface fault rupture of known active faults beneath occupied structures. Requires disclosure to potential buyers of existing real estate and a 50-foot setback for new occupied buildings. The project site is not located within a designated Alquist-Priolo Fault Zone.
The Seismic Hazards Mapping Act, PRC section 2690–2699	Areas are identified that are subject to the effects of strong ground shaking, such as liquefaction, landslides, tsunamis, and seiches.
PRC, Chapter 1.7, sections 5097.5 and 30244	Regulates removal of paleontological resources from state lands, defines unauthorized removal of fossil resources as a misdemeanor, and requires mitigation of disturbed sites.
Warren-Alquist Act, PRC, sections 25527 and 25550.5(i)	The Warren-Alquist Act requires the Energy Commission to "give the greatest consideration to the need for protecting areas of critical environmental concern, including, but not limited to, unique and irreplaceable scientific, scenic, and educational wildlife habitats; unique historical, archaeological, and cultural sites…" With respect to paleontologic resources, the Energy Commission relies on guidelines from the Society for Vertebrate Paleontology (SVP), indicated below.

Applicable Law	Description
California Environmental Quality Act (CEQA), PRC Chapter 21000 et seq., Guidelines 15000 et seq., Appendix G – Environmental Checklist form.	Mandates that public and private entities identify the potential impacts on the environment during proposed activities. Appendix G outlines the requirements for compliance with CEQA and provides a definition of significant impacts on a fossil site [Refer to Comment 5.2.1].
Local	
City of Carson General Plan	Requires steps to minimize the risk of injury, loss of life, and property damage caused by earthquake hazards.
Applicable Standard (General)	
Society for Vertebrate Paleontology (SVP), 1995	The "Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontological Resources: Standard Procedures" is a set of procedures and standards for assessing and mitigating impacts to vertebrate or significant invertebrate fossils or significant suites of plant fossils~~paleontological resources~~. The measures were adopted in October 1995 by the SVP, a national organization of professional scientists [Refer to Comment 5.2.2].

SETTING

The proposed BP Watson project would be constructed on approximately 2.5 acres of previously developed land located within the existing BP Carson Refinery at 22850 South Wilmington Avenue in the City of Carson, Los Angeles County, California. The proposed project site is predominantly vacant although an existing warehouse/maintenance shop would be demolished prior to initiation of construction activities.

The proposed project is an expansion of the existing steam and electrical energy generating facility already on-site and is located in an area originally allocated for the additional steam turbine, generator, and cooling equipment. No upgrade to the existing transmission line or project water supply is required. Natural gas is also already piped to the site but two new (redundant) gas compressors will be necessary.

REGIONAL SETTING

The BP Watson project site would be located in Los Angeles County, California, within the Los Angeles Basin at the northern end of the Peninsular Ranges geomorphic province (Norris and Webb, 1990). The Peninsular Ranges geomorphic province extends from the Los Angeles Basin in the north some 900 miles south to the tip of Baja California in Mexico (Norris and Webb 1990). The Peninsular Ranges Geomorphic Province varies from approximately 30 to 100 miles in width. The highland and mountain masses of the Peninsular Range on the north and east sides of Los Angeles County are characterized by Cenozoic to Tertiary volcanic, intrusive, metamorphic, and sedimentary rocks which slope steeply downward to alluvial, colluvial and uplifted marine deposits along the Pacific coast to the south and west. Mountains of the Peninsular Range are being actively offset by northwest-trending right-lateral strike-slip faulting. In addition, active regional reverse and thrust faulting, associated with compressional tectonics, continues to cause uplift in the east-west-trending Transverse Ranges which form the northern boundary of the Peninsular Range Geomorphic Province and along blind thrusts which underlie the Los Angeles basin (CGS 2002). Extensively folded and faulted Miocene age volcanic and marine sedimentary rocks of the Monterrey Formation form the Palos Verde Peninsula southwest of the proposed site (Dibblee 1999).

PROJECT SITE DESCRIPTION

The proposed BP Watson project site lies in the relatively flat flood plain of the Los Angeles River. Local surface deposits are mapped as young alluvial fan and valley deposits which overlie old alluvial flood plain deposits. Young alluvial fan and valley deposits are described as poorly consolidated and poorly sorted clay, sand, gravel, and cobbles. Old alluvial flood plain deposits are described as fluvial sediment deposits on valley floors consisting of moderately well consolidated, poorly sorted, permeable, slightly dissected gravel, sand, silt, and clay bearing alluvium.

EQFAULT™ Version 3.00 was used to model seismic sources within 62 miles (100 kilometers) of the BP Watson project site (Blake 2006). The various faults are listed below in **Geology and Paleontology Table 2**, along with the distance from the project site and maximum estimated earthquake magnitude. The peak acceleration, fault type, and fault class for each fault is also given. The fault locations can be found on the Fault Activity Map of California (CDMG 1994) and on the Southern California Earthquake Data Center website (SCEC 2008).

Fault Name	Distance From Site (miles)	Maximum Earthquake Magnitude (Mw)	Estimated Peak Site Acceleration (g)	Fault Type and Strike	Fault Class
Newport-Inglewood (LA Basin)	2.6	7.1	0.416	Right-Lateral Strike Slip (Northwest)	B
Palos Verdes	4.4	7.3	0.378	Right-Lateral Strike Slip (Northwest)	B
Puente Hills Blind Thrust	11.1	7.1	0.234	Blind Thrust/Reverse (West)	B
Upper Elysian Park Blind Thrust	17.3	6.4	0.117	Blind Thrust/Reverse (Northwest)	B

Geology and Paleontology Table 2

Active Faults Relative to the Proposed BP Watson Project Site

Fault Name	Distance From Site (miles)	Maximum Earthquake Magnitude (Mw)	Estimated Peak Site Acceleration (g)	Fault Type and Strike	Fault Class
Whittier	17.5	6.8	0.118	Right-Lateral Reverse/Oblique Slip (Northwest)	A
Santa Monica	19.6	6.6	0.119	Left-Lateral Reverse/Oblique Slip (West)	B
San Joaquin Hills Blind Thrust	19.8	6.6	0.118	Blind Thrust/Reverse (Northwest)	B
Hollywood	20.6	6.4	0.103	Left-Lateral Reverse/Oblique Slip (West)	B
Raymond	21.1	6.5	0.106	Left-Lateral Reverse/Oblique Slip (West)	B
Malibu Coast	22.2	6.7	0.114	Left-Lateral Reverse/Oblique Slip (West)	B
Verdugo	22.4	6.9	0.126	Reverse (Northwest)	B
Newport-Inglewood (Offshore)	24.5	7.1	0.107	Right-Lateral Strike Slip (Northwest)	B
San Jose	26.0	6.4	0.086	Left-Lateral Reverse/Oblique Slip (Northeast)	B
Sierra Madre	26.8	7.2	0.128	Reverse (West)	B
Northridge (East Oak Ridge)	26.8	7.0	0.116	Blind Thrust/Reverse (West)	B
Elsinore (Chino-Central Ave.)	28.0	6.7	0.095	Right-Lateral Reverse/Oblique Slip (Northwest)	B
Anacapa-Dume	28.3	7.5	0.144	Reverse/Left-Lateral/Oblique Slip (West)	B
Clamshell-Sawpit	28.6	6.5	0.084	Reverse (Northeast)	B
Sierra Madre (San Fernando)	31.9	6.7	0.086	Reverse (West)	B
San Gabriel	34.7	7.2	0.087	Right-Lateral Strike Slip (West)	B
Elsinore (Glen Ivy)	35.0	6.8	0.070	Right-Lateral Strike Slip (Northwest)	A
Cucamonga	36.5	6.9	0.086	Reverse (West)	B
Santa Susana	37.5	6.7	0.076	Reverse (West)	B
Coronado Bank	42.0	7.6	0.092	Right-Lateral Strike Slip (Northwest)	B
Simi – Santa Rosa	42.3	7.0	0.081	Left-Lateral Reverse Oblique Slip (West)	B
Holser	42.4	6.5	0.062	Reverse (West)	B
Oak Ridge (Onshore)	45.8	7.0	0.076	Reverse (West)	B
San Andreas – Entire M-1a	49.0	8.0	0.101	Right-Lateral Strike Slip (Northwest)l	A
San Jacinto-San Bernardino	51.6	6.7	0.049	Right-Lateral Strike Slip (Northwest)	A
San Cayetano	52.1	7.0	0.069	Reverse (West)	B

Fault Name	Distance From Site (miles)	Maximum Earthquake Magnitude (Mw)	Estimated Peak Site Acceleration (g)	Fault Type and Strike	Fault Class
Elsinore (Temecula)	52.9	6.8	0.051	Right-Lateral Strike Slip (North)	A
San Andreas – San Bernardino-Coachella	53.9	7.7	0.080	Right-Lateral Strike Slip (Northwest)	A
San Andreas - San Bernardino	53.9	7.5	0.072	Right-Lateral Strike Slip (Northwest)	A
Cleghorn	56.4	6.5	0.041	Left-Lateral Strike Slip (West)	B
Oak Ridge Offshore Blind Thrust	57.9	7.1	0.067	Reverse Blind Thrust (West)	B
Channel Islands Thrust (Eastern)	59.7	7.5	0.081	Reverse (West)	B
San Jacinto Valley	59.7	6.9	0.049	Right-Lateral Strike Slip (Northwest)	A

ASSESSMENT OF IMPACTS AND DISCUSSION OF MITIGATION

This section considers two types of impacts. The first is geologic hazards, which could impact the proper functioning of the proposed facility and create life/safety concerns. The second is the potential impacts the proposed facility could have on existing geologic, mineralogic, and paleontologic resources in the area.

METHOD AND THRESHOLD FOR DETERMINING SIGNIFICANCE

No federal LORS concerning geologic hazards and geologic and mineralogic resources apply to this project. The California Building Standards Code (CBSC) and CBC (2007) require geotechnical and geological investigation and design guidelines, which engineers must follow when designing a facility. As a result, the criteria used to assess the significance of a geologic hazard includes evaluating each hazard's potential impact on the design and construction of the proposed facility. Geologic hazards include faulting and seismicity, liquefaction, dynamic compaction, hydrocompaction, subsidence, expansive soils, landslides, tsunamis, seiches, and others as may be dictated by site-specific conditions. Of these, dynamic compaction, hydrocompaction, subsidence, and expansive soils do present serious life/safety concerns.

The California Environmental Quality Act (CEQA) guidelines, Appendix G, provide a checklist of questions that lead agencies typically address when assessing the impacts of the project on geologic, mineralogic, and paleontologic resources, and the potential impacts of geologic hazards to people or structures.

- Section (V) (c) includes guidelines that determine if a project will either directly or indirectly destroy a unique paleontological resource or site, or a unique geological feature.
- Sections (VI) (a), (b), (c), (d), and (e) focus on whether or not the project would expose persons or structures to geologic hazards.
- Sections (X) (a) and (b) concern the project's effects on mineral resources.

Staff has reviewed geologic and mineral resource maps for the surrounding area, as well as site-specific information provided by the Watson Cogeneration Company (Watson), to determine if geologic and mineralogic resources exist in the area and to determine if plant operations could adversely affect any such resources.

California Energy Commission staff reviewed existing paleontologic information and requested records searches from the Natural History Museum of Los Angeles County (NHLMC) and the vertebrate paleontology section of the San Bernardino County Museum (SBCM) for the surrounding area. The University of California (at Berkeley) Museum of Paleontology's (UCMP) website, which gives generalized information for locality records of their collection, was consulted as well (UCMP 2008). Site-specific information generated by Watson for the project was also reviewed. All research was conducted in accordance with accepted assessment protocol (SVP, 1995) to determine whether any known paleontologic resources exist in the general area. If present or likely to be present, conditions of certification which outline required procedures to mitigate impacts to potential paleontological resources, and proposed as part of the projects approval.

DIRECT/INDIRECT IMPACTS AND MITIGATION

Ground shaking and expansive clays represent the main geologic hazards at this site. These potential hazards can be effectively mitigated through facility design by incorporating recommendations contained in a project-specific geotechnical report. The requirements of the proposed **Facility Design** Conditions of Certification **GEN-1, GEN-5,** and **CIVIL-1** in the **Facility Design** section should also aid in mitigating these impacts to a less than significant level.

No viable geologic or mineralogic resources are known to exist within three miles of the proposed BP Watson project site or project linears.

Numerous oil wells are present in Los Angeles County or immediately offshore. These are primarily found along structural traps formed by anticlinal folding along the Newport-Inglewood Fault north of the site and along the Palos Verdes Fault south of the site. The proposed BP Watson site lies in the synclinal low between the faults and no petroleum or natural gas deposits are known to exist beneath the project site (CDC 1982; CDC 1992; CDC 2001).

No important paleontological resources were observed on the BP Watson site during the paleontological field survey conducted for the project AFC (Watson 2009a). The NHMLC considers the most recent unconsolidated alluvial deposits, which form the natural site surface, to hold little potential for preservation of significant fossil remains. However, the older Quaternary alluvium, which directly underlies the recent alluvium, has yielded fossils including fossil horse, mammoth, mastodon, sloth, wolf, bear, saber-toothed cats, camels, and bison from depths as shallow as eight feet below surface in other areas. For this reason the paleontological sensitivity of older Quaternary (older Pleistocene) alluvium is considered to be high. If the proposed site construction includes significant amounts of grading, excavation, and utility trenching, staff considers the probability that paleontological resources would be encountered during such activities to be high anytime excavation activities fully penetrate the recent alluvial deposits and encounter older Quaternary alluvium. Proposed Conditions of Certification **PAL-1** to

PAL-7 are designed to mitigate paleontological resource impacts, as discussed above, to less than significant levels. These conditions essentially require a worker education program in conjunction with the monitoring of earthwork activities by a qualified professional paleontologist (paleontologic resource specialist; PRS).

The proposed conditions of certification allow the CEC's compliance project manager (CPM) and Watson to adopt a compliance monitoring scheme ensuring compliance with LORS applicable to geologic hazards and the protection of geologic, mineralogic, and paleontologic resources.

Based on the information below, it is the opinion of staff that the potential for significant adverse direct or indirect impacts to the project from geologic hazards, and to potential geologic, mineralogic, and paleontologic resources from the proposed project, is low assuming the proposed conditions of certification are adopted and enforced.

GEOLOGICAL HAZARDS

The AFC (Watson 2009a) provides documentation of potential geologic hazards at the proposed plant site. Review of the AFC, coupled with staff's independent research, indicates that the possibility of geologic hazards at the plant site, during its practical design life, is low. Geologic hazards, such as potential for expansive clay soils and settlement due to compressible soils and dynamic compaction, hydrocompaction, or dynamic compaction, must be addressed in the project specific geotechnical report per California Building Code (CBC 2007) requirements.

Staff's independent research included the review of available geologic maps, reports, and related data of the BP Watson project site. Geological information was available from the California Geological Survey (CGS), California Division of Mines and Geology (CDMG), the U.S. Geological Survey (USGS), and other government organizations. Since 2002, the CDMG has been known as the California Geologic Survey.

Faulting and Seismicity

Type A faults have slip-rates of $\geq$5 mm per year and are capable of producing an earthquake of magnitude 7.0 or greater. Type B faults have slip-rates of two to five mm per year and are capable of producing an earthquake of magnitude 6.5 to 7.0. Eight Type A Faults and 28 Type B faults have been identified within 62 miles (100 kilometers) of the proposed BP Watson project site. The fault type, potential magnitude, and distance from the site were summarized previously in **Geology and Paleontology Table 2**.

The Alquist-Priolo Act of 1973 and subsequent California state law (California Code of Regulations 2001) require that all occupied structures be set back 50 feet or more from the surface trace of an active fault. Since no active faults have been documented within the BP Watson project site, setbacks of occupied structures would not be required.

Staff reviewed the CDMG publication *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions* (1994) and Alquist-Priolo Special Studies Zone mapping and reports (CDMG 2003; CGS 2002; and Hart and Bryant 1999). No active faults are shown on published maps as crossing the boundary of new construction at the proposed BP Watson project site. The nearest major active faults are the Newport-Inglewood Fault located approximately 2.6 miles north, and the Palos Verdes Fault located approximately 4.4 miles to the south. Both are Class B right-lateral strike-slip faults. At least 12 other active or potentially active faults which are estimated to be capable of causing site acceleration greater than 0.1g are present within 28 miles of the site (**Geology and Paleontology Table 2**).

Most of the faults listed on **Geology and Paleontology Table 2** within 62 miles of the proposed BP Watson project site are northwest-striking right-lateral strike-slip faults related to regional transform faulting, of which San Andreas Fault Zone is the central structure. The structural history of the Los Angeles basin is complex due to historic and ongoing compression, extension, and shearing along major regional fault zones. For example, relative motion on the Whittier Fault has changed over time from normal in the Miocene epoch, to reverse in the Pliocene to early Pleistocene, to late Quaternary right-lateral strike-slip (Yeats 2004). Most of the Elsinore Fault is strike-slip in character; however, the fault splays to the north near the Transverse Ranges into the Whittier and Chino-Central Avenue Faults. The history and sense of movement on these, and other faults, becomes more complicated with proximity to the transition zone between the Peninsular Ranges and Transverse Ranges Geomorphic Provinces. Structures that predominantly show reverse and thrust movement characteristic of the compressional tectonics of the Transverse Ranges include, the North Frontal Fault Zone, and the Cleghorn, Cucamonga, San Jose, and Sierra Madre Faults. The Elysian Park, Puente Hills and San Joaquin Hills (Compton) Blind Thrusts are also included in **Geology and Paleontology Table 2,** and developed in response to compressional tectonics. The reverse structures are generally north-dipping and trend east-west, although some are relatively shallow-dipping with variable orientations. The closest known fault is over four miles away so the potential for ground rupture, at the site, is minimal.

The project-specific geotechnical report will indicate the appropriate seismic soil classification for the proposed site and will make recommendations for mitigation of potential hazards due to seismic shaking. The estimated peak horizontal ground acceleration for the proposed power plant site is 0.78 times the acceleration of gravity (0.78g) for bedrock acceleration based on 2% probability of exceedence in 50 years under 2007 CBC criteria (USGS 2007).

<u>Liquefaction</u>

Liquefaction is a condition where in a cohesionless soil may lose shear strength because of sudden increase in pore water pressure caused by an earthquake. The seismic hazards zones map for the Long Beach Quadrangle indicates the proposed project site is in an area outside of any designated liquefaction hazard zone (CDMG 1998a). The historic depth to ground water near the southwest corner of the proposed BP Watson project site has been reported to be as shallow as 10 feet below surface (DWR 2000). The project specific geotechnical report must assess the liquefaction potential of the proposed site to facilitate mitigation of any liquefaction hazard. This will include determination of the depth to ground water, the presence of liquefiable layers such as clean sands, and the relative soil compaction with depth.

Lateral Spreading

Lateral spreading of the ground surface can occur within liquefiable beds during seismic events. Lateral spreading generally requires an abrupt change in slope, such as a nearby steep hillside or deeply eroded stream bank, but can also occur on gentle slopes. Other factors such as distance from the epicenter, magnitude of the seismic event, and thickness and depth of liquefiable layers also affect the amount of lateral spreading. Because the BP Watson project site is nearly flat, the potential for lateral spreading of the site surface during seismic events is very low. If the project geotechnical investigation determines that liquefaction is unlikely, the potential for lateral spreading would be considered negligible.

Dynamic Compaction

Dynamic compaction of soils can occur when relatively unconsolidated granular materials experience vibration associated with seismic events. The vibration causes a decrease in soil volume, as the soil grains tend to rearrange into a more dense state (an increase is soil density). The decrease in volume can result in settlement of overlying structural improvements but not to the extent that it develops a life/safety issue. Mitigation of the possible effects of dynamic compaction of site native and fill soils during an earthquake should be addressed in the final project geotechnical report, per CBC (2007) requirements and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**.

Hydrocompaction

Hydrocompaction (also known as hydro-collapse) is generally limited to young soils that were deposited rapidly in a saturated state, most commonly by a flash flood. The soils dry quickly, leaving an unconsolidated, low density deposit with a high percentage of voids. Foundations built on these types of compressible materials can settle excessively, particularly when landscaping irrigation dissolves the weak cementation that is preventing the immediate collapse of the soil structure. Hydrocompaction does not represent a threat to life or safety. Any necessary mitigation measures for the effects of hydrocompaction of site soils should be addressed as required in the project-specific geotechnical report, per CBC (2007) requirements and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**.

Subsidence

Local subsidence or settlement may occur when areas containing compressible soils are subjected to foundation loads. Regional studies conducted to evaluate the effects of subsidence due to pumping of ground water, oil, and gas reserves indicate no significant regional subsidence is occurring. Subsidence does not represent a threat to life or safety. Recommendations for mitigation of the effects of normal subsidence due to foundation loads should be addressed in the project-specific geotechnical report, per CBC (2007) requirements and proposed **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**. When needed, mitigation is normally accomplished by over-excavation and replacement of the compressible soils. For deep-seated conditions, deep foundations are commonly used.

Expansive Soils

Soil expansion occurs when clay-rich soils with an affinity for water exist at a moisture content below their plastic limit. The addition of moisture from irrigation, precipitation, capillary tension, water line breaks, etc. causes the clay soils to absorb water molecules into their structure, which in turn causes an increase in the overall volume of the soil. This increase in volume can correspond to excessive movement (heave) of overlying structural improvements. Expansive soils do not represent a threat to life or safety. The potential for and methods for mitigation of the effects of expansive soils should be addressed in the project-specific geotechnical report, per CBC (2007) requirements and **Facility Design** Conditions of Certification **GEN-1**, **GEN-5** and **CIVIL-1**. Expansive soil mitigation, when necessary, is normally accomplished by over-excavation and replacement of the soils. For deep-seated conditions, deep foundations are commonly used. Lime-treated (chemical modification) is often used to mitigate expansive clays in pavement areas.

Landslides

The proposed BP Watson project site is relatively flat and the gradual slope of the site coupled with the absence of topographically high ground within or immediately upgradient from the site suggest it is not susceptible to landslide activity. The project-specific engineering geology report should verify that landslide potential is minimal, in accordance with the requirements of the CBC (2007) and proposed **Facility Design** Condition of Certification **GEN-4**.

Flooding

The Federal Emergency Management Agency (FEMA) has identified the proposed BP Watson site and project linears as lying in Unshaded Zone X, which are "areas determined to be outside the 0.2% annual chance flood plain" (FEMA 2008). Therefore, the potential for flooding to impact the proposed site is considered to be low.

Tsunamis and Seiches

Tsunamis are large-scale seismic-sea waves caused by offshore earthquakes, landslides and/or volcanic activity. The proposed BP Watson project site lies inland approximately four miles from the Long Beach Harbor. The potential tsunami height that might impact Southern California has been estimated at up to 11.5 feet (McCullogh 1985). Recently, run-up heights up to three feet above mean sea level (msl) have been predicted on the Southern California coastline, although heights up to 16 feet could occur at San Diego due to the configuration of the bay (CSSC 2005). The proposed BP Watson project lies outside of the area designated by the California Emergency Management Agency (CalEMA) as a potential tsunami inundation area (CalEMA 2009). Given the power plant footing elevation of approximately 30 feet msl, a tsunami of the maximum indicated height of 11.5 feet cannot impact the site. No large inland surface water bodies which could produce seiches are located near the proposed plant site.

GEOLOGIC, MINERALOGIC, AND PALEONTOLOGIC RESOURCES

Staff has reviewed applicable geologic maps and reports for this area (CDC 1992; CDC 2001; CDMG 1966; CDMG 1990; CDMG 1994; CDMG 1997; CDMG 1998b; CDMG 1999; CDMG 2003; CGS 2003; McCleod 2009; UCMP 2008). Historically, minor quantities of gold, silver, and other metals as well as industrial minerals such as barite and kaolinite were produced in Los Angeles County, primarily from the Cenozoic to Tertiary volcanic, intrusive, metamorphic, and sedimentary rocks which form the highlands of the north and east portions of the county (CDMG 1999). Alluvium and colluvium of the Los Angeles River have yielded primarily aggregate in the form of sand and gravel.

Staff did not identify any geological resources at the facility location or along project linears and given the absence of rock outcrops on or near the site surface there is very low potential for this site to have economically valuable mineral deposits.

The Energy Commission staff has reviewed the Paleontological Resources assessment in Section 5.8 and Paleontological Records Search and Literature Review (Confidential) in Appendix E3 of the AFC (Watson 2009c). Staff has also reviewed the paleontological literature and records searches conducted by the NHMLC (McCleod 2009), as well as the online records database maintained by the UCMP (2008). No paleontological finds have been documented on the proposed BP Watson project site.

Construction Impacts and Mitigation

The design-level geotechnical investigation required for the project by the CBC (2007) and proposed **Facility Design** Condition of Certification **GEN-1** will provide standard engineering design recommendations for mitigation of potential expansive clay soils, as well as excessive settlement due to compressible soils or dynamic compaction, as appropriate (See proposed Conditions of Certification **Facility Design**).

As noted above, no viable geologic or mineralogic resources are known to exist within three miles of the proposed BP Watson construction site or linear routes. The potential to impact significant paleontological resources in older Quaternary (older Pleistocene) sediments, especially in deeper excavations, is considered to be high. Fill materials, if present, and younger alluvium have a negligible paleontological sensitivity. Construction of the proposed project would include grading, excavation, and utility trenching. Staff considers the probability of encountering paleontological resources to be generally high in excavations which penetrate through the recent alluvium and encounter older Quaternary alluvium. The potential for encountering fossils would increase with the depth of excavation.

Proposed Conditions of Certification **PAL-1 to PAL-7** are designed to mitigate any paleontological resource impacts, as discussed above, to a less than significant level. Essentially, these conditions require a worker education program in conjunction with monitoring of earthwork activities by qualified professional paleontologists (paleontologic resource specialist; PRS). Earthwork in the immediate vicinity is halted any time potential fossils are recognized by either the paleontologist or the worker [Refer to Comment 5.2.3]. When properly implemented, the conditions of certification yield a net gain to the science of paleontology since fossils that would not other wise have been discovered can be collected, identified, studied, and properly curated. A paleontological resource specialist is retained, for the project by Watson, to produce a monitoring and mitigation plan, conduct the worker training, and provide the on site monitoring. During the monitoring, the PRS can and often does petition the CEC for a change in the monitoring protocol. Most commonly, this is a request for lesser monitoring after sufficient monitoring has been performed to ascertain that there is little chance of finding significant fossils. In other cases, the PRS can propose increased monitoring due to unexpected fossil discoveries or in response to repeated out-of-compliance incidents by the earthwork contractor.

Based upon the literature and archives search, field surveys, and compliance documentation for the proposed BP Watson project, Watson has proposed monitoring and mitigation measures to be followed during the construction of the project. Staff believes that the facility can be designed and constructed to minimize the effect of geologic hazards at the site during project design life and that impacts to any vertebrate fossils encountered during construction of the power plant and associated linears would be mitigated to a level of insignificance.

Operation Impacts and Mitigation

Operation of the proposed plant facilities should not have any adverse impact on geologic, mineralogic, or paleontologic resources. Potential geologic hazards, including strong ground shaking, foundation settlement due to compressible soils, dynamic compaction, and the possible presence of expansive clay soils can be effectively mitigated through facility design (See proposed Conditions of Certification **GEN-1, GEN-5** and **CIVIL-1** in the **Facility Design** section) such that these potential hazards should not affect operation of the facility.

CUMULATIVE IMPACTS AND MITIGATION

The proposed BP Watson project site is situated in an active geologic environment. Strong ground shaking potential must be mitigated through foundation and structural design as required by the CBC (2007). Expansive materials, as well as compressible soils and soils that may possibly be subject to subsidence due to dynamic compaction, must be mitigated in accordance with a design-level geotechnical investigation as required by the CBC (2007), and proposed Conditions of Certification **GEN-1, GEN-5, and CIVIL-1** under **Facility Design**. Paleontological resources have been documented in the general area of the project and in sediments similar to those that are present at depth on the site. However, to date, none have been found on the plant site. The potential impacts to paleontological resources due to construction activities would be mitigated as required by proposed Conditions of Certification **PAL-1 to PAL-7**.

Staff believes that the potential for significant adverse cumulative impacts to the proposed project from geologic hazards, during the project's design life, is low, and that the potential for impacts to geologic, mineralogic, and paleontologic resources is very low.

Based upon the literature and archives search, field surveys and compliance documentation for the proposed BP Watson project, Watson proposes monitoring and mitigation measures for construction of the project. Energy Commission staff agrees with Watson that the project can be designed and constructed to minimize the effects of geologic hazards at the site, and that impacts to scientifically significant vertebrate and invertebrate fossils encountered during construction would be mitigated to levels of less than significant.

The proposed conditions of certification allow the CEC (CPM) and Watson to adopt a compliance monitoring scheme ensuring compliance with applicable LORS for geologic hazards and geologic, mineralogic, and paleontologic resources.

FACILITY CLOSURE

Facility closure activities are not expected to impact geologic or mineralogic resources since no such resources are known to exist at either the project location or along its proposed linears. In addition, the decommissioning and closure of the project should not negatively affect geologic, mineralogic, or paleontologic resources since the majority of the ground disturbed during plant decommissioning and closure would have been already disturbed, and mitigated as required, during construction and operation of the project.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

Energy Commission staff has not received any agency or public comments regarding geologic hazards, mineral resources, or paleontology at this time.

CONCLUSIONS

Watson will be able to comply with applicable LORS, provided that the proposed conditions of certification are adopted and enforced. The design and construction of the project should have no adverse impact with respect to geologic, mineralogic, and paleontologic resources. Staff proposes to ensure compliance with applicable LORS through the adoption of the proposed conditions of certification listed below.

PROPOSED CONDITIONS OF CERTIFICATION

General conditions of certification with respect to engineering geology are proposed under Conditions of Certification **GEN-1, GEN-5, and CIVIL-1** in the **Facility Design** section. Proposed paleontological conditions of certification follow in **PAL-1** through **PAL-7**. It is staff's opinion that the likelihood of encountering paleontologic resources is high if any excavations penetrate through the recent alluvium of the site surface. The Energy Commission staff will consider reducing monitoring intensity, at the recommendation of the project PRS, following examination of sufficient, representative, deep excavations to fully understand site stratigraphy.

PAL-1 The project owner shall provide the Compliance Project Manager (CPM) with the resume and qualifications of its Paleontological Resource Specialist (PRS) for review and approval. If the approved PRS is replaced prior to completion of project mitigation and submittal of the Paleontological Resources Report, the project owner shall obtain CPM approval of the replacement PRS. The project owner shall keep resumes on file for qualified Paleontological Resource Monitors (PRMs). If a PRM is replaced, the resume of the replacement PRM shall also be provided to the CPM.

The PRS resume shall include the names and phone numbers of references. The resume shall also demonstrate to the satisfaction of the CPM the appropriate education and experience to accomplish the required paleontological resource tasks.

As determined by the CPM, the PRS shall meet the minimum qualifications for a vertebrate paleontologist as described in the Society of Vertebrate Paleontology (SVP) guidelines of 1995. The experience of the PRS shall include the following:

1. Institutional affiliations, appropriate credentials, and college degree;

2. Ability to recognize and collect fossils in the field;

3. Local geological and biostratigraphic expertise;

4. Proficiency in identifying vertebrate and invertebrate fossils; and

5. At least three years of paleontological resource mitigation and field experience in California and at least one year of experience leading paleontological resource mitigation and field activities.

The project owner shall ensure that the PRS obtains qualified paleontological resource monitors to monitor as he or she deems necessary on the project. Paleontologic Resource Monitors (PRMs) shall have the equivalent of the following qualifications:

- BS or BA degree in geology or paleontology and one year of experience monitoring in California; or
- AS or AA in geology, paleontology, or biology and four years' experience monitoring in California; or
- Enrollment in upper division classes pursuing a degree in the fields of geology or paleontology and two years of monitoring experience in California.

<u>Verification:</u> (1) At least 60 days prior to the start of ground disturbance, the project owner shall submit a resume and statement of availability of its designated PRS for on-site work.

(2) At least 20 days prior to ground disturbance, the PRS or project owner shall provide a letter with resumes naming anticipated monitors for the project, stating that the identified monitors meet the minimum qualifications for paleontological resource monitoring required by the condition. If additional monitors are obtained during the project, the PRS shall provide additional letters and resumes to the CPM. The letter shall be provided to the CPM no later than one week prior to the monitor's beginning on-site duties.

(3) Prior to the termination or release of a PRS, the project owner shall submit the resume of the proposed new PRS to the CPM for review and approval.

PAL-2 The project owner shall provide to the PRS and the CPM, for approval, maps and drawings showing the footprint of the power plant, construction lay down areas, and all related facilities. Maps shall identify all areas of the project where ground disturbance is anticipated. If the PRS requests enlargements or strip maps for linear facility routes, the project owner shall provide copies to the PRS and CPM. The site grading plan and plan and profile drawings for the utility lines would be acceptable for this purpose. The plan drawings should show the location, depth, and extent of all ground disturbances and be at a scale between 1 inch = 40 feet and 1 inch = 100 feet range. If the footprint of the project or its linear facilities change, the project owner shall provide maps and drawings reflecting those changes to the PRS and CPM.

If construction of the project proceeds in phases, maps and drawings may be submitted prior to the start of each phase. A letter identifying the proposed schedule of each project phase shall be provided to the PRS and CPM. Before work commences on affected phases, the project owner shall notify the PRS and CPM of any construction phase scheduling changes.

At a minimum, the project owner shall ensure that the PRS or PRM consults weekly with the project superintendent or construction field manager to confirm area(s) to be worked the following week, and until ground disturbance is completed.

<u>**Verification:**</u> (1) At least 30 days prior to the start of ground disturbance, the project owner shall provide the maps and drawings to the PRS and CPM.

(2) If there are changes to the footprint of the project, revised maps and drawings shall be provided to the PRS and CPM at least 15 days prior to the start of ground disturbance.

(3) If there are changes to the scheduling of the construction phases, the project owner shall submit a letter to the CPM within five days of identifying the changes.

PAL-3 The project owner shall ensure that the PRS prepares, and the project owner submits to the CPM for review and approval, a paleontological resources monitoring and mitigation plan (PRMMP) to identify general and specific measures to minimize potential impacts to significant paleontological resources. Approval of the PRMMP by the CPM shall occur prior to any ground disturbance. The PRMMP shall function as the formal guide for monitoring, collecting, and sampling activities, and may be modified with CPM approval. This document shall be used as the basis of discussion when on-site decisions or changes are proposed. Copies of the PRMMP shall reside with the PRS, each monitor, the project owner's on-site manager, and the CPM.

The PRMMP shall be developed in accordance with the guidelines of the Society of Vertebrate Paleontology (SVP, 1995) and shall include, but not be limited, to the following:

1. Assurance that the performance and sequence of project-related tasks,

such as any literature searches, pre-construction surveys, worker environmental training, fieldwork, flagging or staking, construction monitoring, mapping and data recovery, fossil preparation and collection, identification and inventory, preparation of final reports, and transmittal of materials for curation will be performed according to PRMMP procedures;

2. Identification of the person(s) expected to assist with each of the tasks identified within the PRMMP and the conditions of certification;

3. A thorough discussion of the anticipated geologic units expected to be encountered, the location and depth of the units relative to the project when known, and the known sensitivity of those units based on the occurrence of fossils either in that unit or in correlative units;

4. An explanation of why, how, and how much sampling is expected to take place and in what units. Include descriptions of different sampling procedures that shall be used for fine-grained and coarse-grained units;

5. A discussion of the locations of where the monitoring of project construction activities is deemed necessary, and a proposed plan for monitoring and sampling;

6. A discussion of procedures to be followed in the event of a significant fossil discovery, halting construction, resuming construction, and how notifications will be performed;

7. A discussion of equipment and supplies necessary for collection of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;

8. Procedures for inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meet the Society of Vertebrate Paleontology's standards and requirements for the curation of paleontological resources;

9. Identification of the institution that has agreed to receive data and fossil materials collected, requirements or specifications for materials delivered for curation, and how they will be met, and the name and phone number of the contact person at the institution; and

10. A copy of the paleontological conditions of certification.

<u>Verification:</u> At least 30 days prior to ground disturbance, the project owner shall provide a copy of the PRMMP to the CPM. The PRMMP shall include an affidavit of authorship by the PRS, and acceptance of the PRMMP by the project owner evidenced by a signature.

PAL-4 Prior to ground disturbance and for the duration of construction activities involving ground disturbance, the project owner and the PRS shall prepare and conduct weekly CPM-approved training for the following workers: project managers, construction supervisors, foremen and general workers involved with or who operate ground-disturbing equipment or tools. Workers shall not excavate in sensitive units prior to receiving CPM-approved worker training. Worker training shall consist of a CPM-approved video or in-person presentation. The training program may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or other areas of interest or concern. No ground disturbance shall occur prior to CPM approval of the Worker Environmental Awareness Program (WEAP), unless specifically approved by the CPM.

The WEAP shall address the possibility of encountering paleontological resources in the field, the sensitivity and importance of these resources, and legal obligations to preserve and protect those resources.

The training shall include:

1. A discussion of applicable laws and penalties under the law;
2. Good quality photographs or physical examples of vertebrate fossils for project sites containing units of high paleontologic sensitivity;
3. Information that the PRS or PRM has the authority to halt or redirect construction in the event of a discovery or unanticipated impact to a paleontological resource;
4. Instruction that employees are to halt or redirect work in the vicinity of a find and to contact their supervisor and the PRS or PRM;
5. An informational brochure that identifies reporting procedures in the event of a discovery;
6. A WEAP certification of completion form signed by each worker indicating that he/she has received the training; and
7. A sticker that shall be placed on hard hats indicating that environmental training has been completed.

Verification: (1) At least 30 days prior to ground disturbance, the project owner shall submit the proposed WEAP, including the brochure, with the set of reporting procedures for workers to follow.

(2) At least 30 days prior to ground disturbance, the project owner shall submit the script and final video to the CPM for approval if the project owner is planning to use a video for interim training.

(3) If the owner requests an alternate paleontological trainer, the resume and qualifications of the trainer shall be submitted to the CPM for review and approval prior to installation of an alternate trainer. Alternate trainers shall not conduct training prior to CPM authorization.

(4) In the monthly compliance report (MCR), the project owner shall provide copies of the WEAP certification of completion forms with the names of those trained and the trainer or type of training (in-person or video) offered that month. The MCR shall also include a running total of all persons who have completed the training to date.

PAL-5 The project owner shall ensure that the PRS and PRM(s) monitor consistent with the PRMMP all construction-related grading, excavation, trenching, and augering in areas where potential fossil-bearing materials have been identified, both at the site and along any constructed linear facilities associated with the project. In the event that the PRS determines full-time monitoring is not necessary in locations that were identified as potentially fossil-bearing in the PRMMP, the project owner shall notify and seek the concurrence of the CPM.

The project owner shall ensure that the PRS and PRM(s) have the authority to halt or redirect construction if paleontological resources are encountered. The project owner shall ensure that there is no interference with monitoring activities unless directed by the PRS. Monitoring activities shall be conducted as follows:

1. Any change of monitoring from the accepted schedule in the PRMMP shall be proposed in a letter or email from the PRS and the project owner to the CPM prior to the change in monitoring and will be included in the monthly compliance report. The letter or email shall include the justification for the change in monitoring and be submitted to the CPM for review and approval.

2. The project owner shall ensure that the PRM(s) keep a daily monitoring log of paleontological resource activities. The PRS may informally discuss paleontological resource monitoring and mitigation activities with the CPM at any time.

3. The project owner shall ensure that the PRS notifies the CPM within 24 hours of the occurrence of any incidents of non-compliance with any paleontological resources conditions of certification. The PRS shall recommend corrective action to resolve the issues or achieve compliance with the conditions of certification.

4. For any significant paleontological resources encountered, either the project owner or the PRS shall notify the CPM within 24 hours, or Monday morning in the case of a weekend event where construction has been halted because of a paleontological find.

The project owner shall ensure that the PRS prepares a summary of monitoring and other paleontological activities placed in the monthly compliance reports. The summary will include the name(s) of PRS or PRM(s) active during the month, general descriptions of training and monitored construction activities, and general locations of excavations, grading, and other activities. A section of the report shall include the geologic units or subunits encountered, descriptions of samplings within each unit, and a list of identified fossils. A final section of the report will address any issues or concerns about the project relating to paleontologic monitoring, including any incidents of non-compliance or any changes to the monitoring plan that have been approved by the CPM. If no monitoring took place during the month, the report shall include an explanation in the summary as to why monitoring was not conducted.

Verification: The project owner shall ensure that the PRS submits the summary of monitoring and paleontological activities in the MCR. When feasible, the CPM shall be notified 10 days in advance of any proposed changes in monitoring different from the plan identified in the PRMMP. If there is any unforeseen change in monitoring, the notice shall be given as soon as possible prior to implementation of the change.

PAL-6 The project owner, through the designated PRS, shall ensure that all components of the PRMMP are adequately performed including collection of fossil materials, preparation of fossil materials for analysis, analysis of fossils, identification and inventory of fossils, the preparation of fossils for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during project construction.

Verification: The project owner shall maintain in his/her compliance file copies of signed contracts or agreements with the designated PRS and other qualified research specialists. The project owner shall maintain these files for a period of three years after project completion and approval of the CPM-approved paleontological resource report (see **PAL-7**). The project owner shall be responsible for paying any curation fees charged by the museum for fossils collected and curated as a result of paleontological mitigation. A copy of the letter of transmittal submitting the fossils to the curating institution shall be provided to the CPM.

PAL-7 The project owner shall ensure preparation of a Paleontological Resources Report (PRR) by the designated PRS. The PRR shall be prepared following completion of the ground-disturbing activities. The PRR shall include an analysis of the collected fossil materials and related information, and submit it to the CPM for review and approval.

The report shall include, but is not limited to, a description and inventory of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the PRS that project impacts to paleontological resources have been mitigated below the level of significance.

Verification: Within 90 days after completion of ground-disturbing activities, including landscaping, the project owner shall submit the PRR under confidential cover to the CPM.

Certification of Completion
Worker Environmental Awareness Program

Watson Cogeneration Steam and Electric Reliability Project (09-AFC-01)

This is to certify these individuals have completed a mandatory California Energy Commission-approved Worker Environmental Awareness Program (WEAP). The WEAP includes pertinent information on cultural, paleontological, and biological resources for all personnel (that is, construction supervisors, crews, and plant operators) working on site or at related facilities. By signing below, the participant indicates that he/she understands and shall abide by the guidelines set forth in the program materials. Include this completed form in the Monthly Compliance Report.

No.	Employee Name	Title/Company	Signature
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			
25.			

Cultural Trainer: ______________ Signature:___________________ Date: ___/___/____

PaleoTrainer: _______________ Signature:___________________ Date: ___/___/____

Biological Trainer: ______________Signature:________________ Date:___/___/___

REFERENCES

Blake, T.F., 2006, EQFAULT™ Version 3.00, *A Computer Program for the Deterministic Estimation of Peak Acceleration Using Three-Dimensional California Faults as Earthquake Sources*, http://thomasfblake.con/eqfault.htm.

CalEMA 2009-California Emergency Management Agency, *Tsunami Inundation Map for Emergency Planning State of California – County of Los Angeles Torrance Quadrangle San Pedro Quadrangle,* A joint preparation of the California Emergency Management Agency, California Geological Survey, and University of Southern California, March 1, 2009.

CBC 2007-California Building Code.

CCR 2001-California Code of Regulations, Title 24. 2001, (*California Building Standards Code* [CBSC]), Part 2, *California Building Code* (CBC).

CDC 1982-California Department of Conservation, *Oil &, Gas Prospect Wells Drilled in California Through 1980.* Publication No. TR01, Second Edition.

CDC 1992, *California Oil & Gas Fields, Volume II (Southern, Central Coast, and Offshore California).*

CDC 2001, *Oil, Gas, and Geothermal Fields in California.*

CDMG 1966-California Division of Mines and Geology. *Geologic Map of California, Long Beach Sheet,* Scale 1:250,000.

CDMG 1990, *Industrial Minerals in California: Economic Importance, Present Availability, and Future Development*, Special Publication 105, reprinted from U.S. Geological Survey Bulletin 1958.

CDMG 1994, *Fault Activity Map of California and Adjacent Areas with Locations and Ages of Recent Volcanic Eruptions, Scale 1:750,000.*

CDMG 1997, *Seismic Hazard Zone Report for the Long Beach 7.5-Minute Quadrangle, Los Angeles County, California,* Seismic Hazard Zone Report 028.

CDMG 1998a, S*eismic Hazard Zones Map, Long Beach Quadrangle.*

CDMG 1998b, *Gold Districts of California*, Sesquicentennial Edition, California Gold Discovery to Statehood, Bulletin 193.

CDMG 1999, *Mines and Mineral Producers Active in California (1997–1998,.* Special Publication 103.

CDMG 2003, *Fault Investigation Reports for Development Sites Within Alquist-Priolo*

Earthquake Fault Zones in Southern California, 1974-2000.

CGS 2002-California Geological Survey, *California Geomorphic Provinces*. CGS Note 36.

CGS 2003, *Geologic Map of the Long Beach 30' x 60' Quadrangle, California*. Map Number 5, Version 1.0, Regional Geologic Map Series.

CSSC 2005-California Seismic Safety Commission, The Tsunami Threat to California, Findings and Recommendations on Tsunami Hazards and Risks, December.

Dibblee, Thomas W. Jr., 1999, *Geologic Map of the Palos Verdes Peninsula and Vicinity,* Dibblee Geological Foundation Map #DF-70.

DWR 2000-Department of Water Resources, Informational Web Site, http://www.water.ca.gov

FEMA 2008-Federal Emergency Management Agency, *Flood Insurance Rate Map, Los Angeles County, California and Incorporated Areas, Flood Insurance Rate Map No. 06037C1955F,* September 26, 2008*.*

Hart, E. W. and Bryant, W. A., 1999, *Fault-Rupture Hazard Zones in California, Alquist-Priolo Earthquake Fault Zoning Act with Index to Earthquake Fault Zones Maps:* California Division of Mines and Geology Special Publication 42.

ICC 2006-International Code Council, *International Building Code*.

McCulloch, D.S. 1985, *Evaluating Tsunami Potential*. In Evaluating Earthquake Hazards in the Los Angeles Region – An Earth-Science perspective, P. 375-413.

McLeod, S.A. 2009, Unpublished paleontology resources report, Natural History Museum of Los Angeles County, Los Angeles, California, 2 p.

Norris, R. M. and R. W. Webb, 1990, *Geology of California*. Second Edition, John Wiley and Sons, New York.

SCEC 2008-Southern California Earthquake Center, Data Center Website: http://www.data.scec.org/.

SVP 1995-Society for Vertebrate Paleontology, *Measures for Assessment and Mitigation of Adverse Impacts to Non-Renewable Paleontologic Resources: Standard Procedures.*

UCMP 2008-University of California Museum of Paleontology, Paleontology Collection Locality Records Website: http://ucmpdb.berkeley.edu/.

USGS 2007-United States Geological Survey, *Earthquake Ground Motion Parameters,* Version 5.0.8.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584), Application for Certification Volume I&II, dated 3/19/09, Submitted to CEC/Docket Unit on 3/19/09.

Watson 2009b – Watson Cogeneration Company/Thomas A. Lu (tn 50627), Application for Confidential - Paleontological Resources Technical Report, dated 3/19/09, Submitted to CEC/Docket Unit on 3/19/09.

Yeats, Robert S. 2004, Tectonics of the San Gabriel Basin and Surroundings, Southern California, GSA Bulletin, v. 116, no. 9/10.

POWER PLANT RELIABILITY

Erin Bright

SUMMARY OF CONCLUSIONS

Watson Cogeneration Company (Watson), the applicant, predicts an equivalent availability factor of 90 to 100%. Staff believes the middle of this range is achievable. Based on a review of the Application for Certification, staff concludes that the Watson Cogeneration Steam and Electric Reliability Project (BP Watson) would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

INTRODUCTION

In this analysis, California Energy Commission (Energy Commission) staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because it ensures that the resulting project would likely not degrade the overall reliability of the electric system it serves (see "Setting" below).

The scope of this power plant reliability analysis covers:

- equipment availability;
- plant maintainability;
- fuel and water availability; and
- power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While the applicant has predicted an equivalent availability factor of 90 to 100% for the BP Watson project (see below), staff uses typical industry norms as a benchmark, rather than Watson's projection, to evaluate the project's reliability.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

No federal, state, or local/county laws, ordinances, regulations, and standards (LORS) apply to the reliability of this project.

SETTING

In the restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the state's control area operators, such as the California Independent System Operator (California ISO), that purchase, dispatch, and sell electric power throughout the state. How the California ISO and other control area operators will ensure system reliability is an ongoing process; protocols are still being developed and put in place that will allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms being employed to ensure an adequate supply of reliable power.

In September 2005, California AB 380 (Núñez, Chapter 367, Statutes of 2005) became law. This modification to the Public Utilities Code requires the California Public Utilities Commission to consult with the California ISO to establish resource adequacy requirements for all load-serving entities (basically, public and privately owned utility companies). These requirements include maintaining a minimum reserve margin (extra generating capacity to serve in times of equipment failure or unexpected demand) and maintaining sufficient local generating resources to satisfy the load-serving entity's peak demand and operating reserve requirements.

In order to fulfill this mandate, the California ISO has begun to establish specific criteria for each load-serving entity under its jurisdiction. These criteria guide each load-serving entity in deciding how much generating capacity and ancillary services to build or purchase, after which the load-serving entity issues power purchase agreements to satisfy these needs [Refer to Comment 5.4.1]. ~~As a load-serving entity, Watson is obligated to satisfy these criteria, which include maintaining a 15% reserve margin and increasing local generation to reduce reliance on imported power~~

The California ISO's mechanisms to ensure adequate power plant reliability apparently have been devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures on power plant owners to minimize capital outlays and maintenance expenditures may act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill, 1994). It is possible that, if significant numbers of power plants were to exhibit individual reliability sufficiently lower than this historical level, the assumptions used by California ISO to ensure system reliability would prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone an adequate shakeout period, and the effects of varying power plant reliability are thoroughly understood and compensated for, staff will recommend that power plant owners continue to build and operate their projects to the level of reliability to which all in the industry are accustomed.

The applicant proposes to operate the 85-megawatt (MW) (nominal net output) BP Watson project, a cogeneration power plant, to meet a need for process steam for the adjacent BP Carson Refinery and capacity and voltage support in the region of the City of Carson (AFC § 2.0). The project is expected to achieve a service factor, similar to an equivalent availability factor (EAF), in the range of 90 to 100% (AFC §§ 3.11.3, 3.11.4). The applicant expects to operate the plant at a capacity factor of 95% during each year of its operating life (AFC § 3.4.5.3).

ASSESSMENT OF IMPACTS

METHOD FOR DETERMINING RELIABILITY

The Energy Commission must make findings as to the manner in which the project is to be designed, sited, and operated to ensure safe and reliable operation (Title 20, CCR §1752[c]). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

The availability factor for a power plant is the percentage of the time that it is available to generate power; both planned and unplanned outages subtract from its availability. Measures of power plant reliability are based on the plant's actual ability to generate power when it is considered available and are based on starting failures and unplanned, or forced, outages. For practical purposes, reliability can be considered a combination of these two industry measures, making a reliable power plant one that is available when called upon to operate. Power plant systems must be able to operate for extended periods without shutting down for maintenance or repairs. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability with scheduled maintenance outages, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the project and compares them to industry norms. If they compare favorably, staff can conclude that the BP Watson project would be as reliable as other power plants on the electric system and will therefore not degrade system reliability.

EQUIPMENT AVAILABILITY

Equipment availability would be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

Quality Control Program

The applicant describes a QA/QC program (AFC § 3.11.7) typical of the power industry. Equipment would be purchased from qualified suppliers based on technical and commercial evaluations. The project owner would perform receipt inspections, test components, and administer independent testing contracts. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

Equipment Redundancy

A generating facility called on to operate in base-load service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

The applicant plans to provide appropriate redundancy of function for the project (AFC § 3.11.4). The BP Watson project is essentially an expansion of the Watson Cogeneration Facility (Facility) and would be operating in parallel with the Facility's four existing trains. Thus BP Watson acts to enhance the operational reliability of the Watson Cogeneration Facility. If the BP Watson project were to experience an equipment failure, the four trains at the original plant would still be able to operate, so the combined facilities would still generate power (at reduced output). Further, all plant ancillary systems are also designed with adequate redundancy to ensure continued operation in the face of equipment failure. Staff believes that equipment redundancy would be sufficient for a project such as this.

Maintenance Program

The applicant proposes to establish a preventive plant maintenance program typical of the industry (AFC § 3.9). Equipment manufacturers provide maintenance recommendations with their products; the applicant would base its maintenance program on these recommendations. The program will encompass preventive and predictive maintenance techniques. Maintenance outages would be planned for periods of low electricity demand. In light of these plans, staff expects that the project would be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

Fuel Availability

The BP Watson project would burn natural gas supplied by Southern California Gas Company (SoCal Gas) and refinery gas supplied by the adjacent BP Carson Refinery. Natural gas fuel would be supplied to the project via the existing pipeline connection that currently serves the Watson Cogeneration Facility (AFC §§ 3.4.7, 3.7.1, 3.11.6.1). This natural gas system represents a resource of considerable capacity and offers access to adequate supplies of gas from the Rocky Mountains, Canada, and the Southwest. Staff agrees with the applicant's prediction that there would be adequate natural gas supply and pipeline capacity to meet the project's needs.

Water Supply Reliability

Water would be supplied to the BP Watson project from existing systems for the Watson Cogeneration Facility, which obtains treated reclaimed water from the West Basin Water Treatment Plant. Water would be used for inlet air fogger consumption, boiler feedwater makeup, and heat recovery steam generator (HRSG) blowdown quenching (AFC §§ 3.4.8, 3.11.6.2). Staff believes this source yields sufficient likelihood of a reliable supply of water. (For further discussion of water supply, see the **Soil and Water Resources** section of this document.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves), seiches (waves in inland bodies of water), and flooding would not likely represent a hazard for this project, but seismic shaking (earthquake) may present a credible threat to reliable operation.

Seismic Shaking

The site lies within the seismically active Southern California. However, no active or potentially active faults have been identified near the project site (AFC §§ 3.11.1.1, 5.3.1.2); see the “Faulting and Seismicity” portion of the **Geology and Paleontology** section of this document. The project will be designed and constructed to the latest applicable LORS (AFC Appendix J). Compliance with current seismic design LORS represents an upgrading of performance during seismic shaking compared to older facilities since these LORS have been continually upgraded. Because it would be built to the latest seismic design LORS, this project would likely perform at least as well as, and perhaps better than, existing plants in the electric power system. Staff has proposed conditions of certification to ensure this; see the section of this document entitled **Facility Design**. In light of the general historical performance of California power plants and the electrical system in seismic events, staff has no special concerns with the power plant’s functional reliability during earthquakes.

Flooding

The site is not within a 100-year flood zone (AFC § 3.11.1.2). Staff believes there are no concerns with power plant functional reliability due to flooding. For further discussion, see **Soil and Water Resources** and **Geology and Paleontology**.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Corporation (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS) and periodically summarizes and publishes the statistics on the Internet [http://www.nerc.com]. Because no statistics are available for cogeneration power plants, staff compares the project’s availability factor to the average availability factor of natural gas combined cycle units. The NERC reported an availability factor of 89.5% as the generating unit average for the years 2002 through 2006 for combined cycle units of any capacity (NERC 2007).

The model of gas turbine that would be employed in the BP Watson project has been on the market for many years now and can be expected to exhibit typically high availability. The middle range of the applicant’s prediction of an annual availability factor of 90 to 100% (AFC §§ 3.11.3, 3.11.4) appears reasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these machines can well be expected to outperform the fleet of various (mostly older and smaller) gas turbines that make up the NERC statistics. Further, since the plant would be operating in parallel with the four units at the Watson Cogeneration Facility, maintenance can be scheduled during those times of year when plant output is not required to meet BP Carson Refinery’s steam requirements or market demand, typical of industry standard maintenance procedures. The applicant's estimate of plant availability, therefore, appears realistic. The stated procedures for assuring design, procurement, and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

NOTEWORTHY PROJECT BENEFITS

The applicant proposes to enhance steam supply reliability at the BP Carson Refinery as well as power supply reliability in the Southern California electricity market by meeting regional energy demands (AFC § 2.0). The fact that the project would operate as an independent equipment train in parallel with the four trains from the existing Watson Cogeneration Facility provides inherent reliability. While a single equipment failure at the BP Watson project could disable operation, the BP Watson project is an expansion to a larger facility with multiple trains; so a single equipment failure, while possibly disabling the project's single train, would not affect the other trains of the Facility. Overall generation would continue (at reduced output).

The gas turbine that would be employed in the project has been on the market for many years and can be expected to exhibit typically high availability. The applicant's prediction of an equivalent availability factor of 90 to 100% appears achievable. Staff believes this should provide an adequate level of reliability.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

None Received.

CONCLUSION

Watson predicts an equivalent availability factor of 90 to 100%, the middle range of which staff believes is achievable. Based on a review of the proposal, staff concludes that the plant would be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability. No conditions of certification are proposed.

PROPOSED CONDITIONS OF CERTIFICATION

No conditions of certification are proposed.

REFERENCES

McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. Operational Experience in Competitive Electric Generation. Executive report.

NERC (North American Electric Reliability Council). 2007. 2002–2006 Generating Availability Report.

Watson 2009a – Watson Cogeneration Company/Thomas A. Lu (tn 50584). Application

for Certification Volume I&II, dated 3/19/09. Submitted to CEC/Docket Unit on 3/19/09.

BEFORE THE ENERGY RESOURCES CONSERVATION AND DEVELOPMENT COMMISSION OF THE STATE OF CALIFORNIA
1516 NINTH STREET, SACRAMENTO, CA 95814
1-800-822-6228 – WWW.ENERGY.CA.GOV

APPLICATION FOR CERTIFICATION
FOR THE *WATSON COGENERATION STEAM AND ELECTRICITY RELIABILITY PROJECT*

Docket No. 09-AFC-1

PROOF OF SERVICE LIST
(Revised 2/8/10)

APPLICANT

Ross Metersky
BP Products North America, Inc.
700 Louisiana Street, 12th Floor
Houston, Texas 77002
ross.metersky@bp.com

APPLICANT'S CONSULTANTS

URS Corporation
Cynthia H. Kyle-Fischer
8181 East Tufts Avenue
Denver, Colorado 80237
cindy_kyle-fischer@urscorp.com

COUNSEL FOR APPLICANT

Chris Ellison
Ellison Schneider and Harris LLP
2600 Capitol Avenue, Suite 400
Sacramento, CA 95816
cte@eslawfirm.com

INTERESTED AGENCIES

California ISO
e-recipient@caiso.com

INTERVENORS

California Unions for Reliable Energy (CURE)
c/o: Tanya A. Gulesserin
Marc D. Joseph
Adams Broadwell Joseph & Cardozo
601 Gateway Boulevard,
Suite 1000
South San Francisco, CA 94080
tgulesserian@adamsbroadwell.com

ENERGY COMMISSION

ROBERT WEISENMILLER
Commissioner and Presiding Member
rweisenm@energy.state.ca.us

KAREN DOUGLAS
Chairman and Associate Member
kldougla@energy.state.ca.us

Kourtney Vaccaro
Hearing Officer
kvaccaro@energy.state.ca.us

Alan Solomon
Project Manager
asolomon@energy.state.ca.us

Christine Hammond
Staff Counsel
chammond@energy.state.ca.us

*Jennifer Jennings
Public Adviser's Office
publicadviser@energy.state.ca.us

*indicates change

DECLARATION OF SERVICE

I, Cindy Kyle-Fischer, declare that on January 17, 2011, I served and filed copies of the attached *Comments on the Preliminary Staff Assessment*, dated January 2011. The original document, filed with the Docket Unit, is accompanied by a copy of the most recent Proof of Service list, located on the web page for this project at: **[www.energy.ca.gov/sitingcases/watson]**.

The document has been sent to both the other parties in this proceeding (as shown on the Proof of Service list) and to the Commission's Docket Unit, in the following manner:

(***Check all that Apply***)

FOR SERVICE TO ALL OTHER PARTIES:

_X_ sent electronically to all email addresses on the Proof of Service list.

_X__ by personal delivery or by depositing in the United States mail at Denver, Colorado with first-class postage thereon fully prepaid and addressed as provided on the Proof of Service list above to those addresses **NOT** marked "email preferred."

AND

FOR FILING WITH THE ENERGY COMMISSION:

_X_sending an original paper copy and one electronic copy, mailed and emailed respectively, to the address below (***preferred method***);

OR

____depositing in the mail an original and ___ paper copies, as follows:

CALIFORNIA ENERGY COMMISSION
Attn: Docket No. 09-AFC-1
1516 Ninth Street, MS-4
Sacramento, CA 95814-5512
docket@energy.state.ca.us

I declare under penalty of perjury that the foregoing is true and correct.

C Kyle-Fischer

_____________________________:
Cindy Kyle-Fischer