

## DOCKETED

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**CALIFORNIA ENERGY COMMISSION**

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**DATE:** January 29, 2016

**TO:** Interested Parties

**FROM:** Joseph Douglas, Compliance Project Manager

**SUBJECT: HIGH DESERT POWER PROJECT (97-AFC-1C)  
Staff Analysis/ Opening Testimony of the Proposed Petition to drought proof the project and allow the use of alternative water supplies**

On October 30, 2015, High Desert Power Trust, the owner of the High Desert Power Project (HDPP), filed a petition with the California Energy Commission (Energy Commission) requesting to amend the Final Decision for the HDPP. Staff prepared an analysis of this proposed change that can be reviewed on the Energy Commission website (see below).

The 830-megawatt, combined-cycle power plant was certified by the Energy Commission on May 3, 2000, and began commercial operations in April 2003. The facility is located in the city of Victorville, in San Bernardino County.

The modifications proposed in the petition would change Conditions of Certification **SOIL&WATER-1** to allow HDPP to use alternative water supplies in addition to State Water Project Water and recycled water from the Victor Valley Water Reclamation Authority. According to the petition, the proposed revisions are necessary to avoid possible operational disruptions due to drought-related water reliability impacts or recycled water interruptions.

Energy Commission staff reviewed the petition, assessed the impacts of this proposal on environmental quality and on public health and safety, and proposes language changes to existing Soil and Water Resources conditions of certification. It is staff's opinion that, with the implementation of the project owner proposed language changes, the facility would not remain in compliance with applicable laws, ordinances, regulations, and standards and that the proposed modifications would result in significant adverse direct or cumulative impacts to the environment (20 Cal. Code of Regs., § 1769).

The Energy Commission's webpage for this facility, [http://www.energy.ca.gov/sitingcases/high\\_desert/](http://www.energy.ca.gov/sitingcases/high_desert/), has a link to the petition and the Staff Analysis on the right side of the webpage in the box labeled "Compliance Proceeding." Click on the "Documents for this Proceeding (Docket Log)" option. The Energy Commission's Order regarding this petition will also be available from the same webpage.

This notice has been mailed to the Commission's list of interested parties and property owners adjacent to the facility site. It has also been e-mailed to the facility listserv. The listserv is an automated Energy Commission e-mail system by which information about this facility is e-mailed to parties who have subscribed. To subscribe, go to the Commission's webpage for this facility, cited above, scroll down the right side of the project's webpage to the box labeled "Subscribe," and provide the requested contact information.

Agencies and members of the public who wish to provide comments on the petition or Staff Analysis are asked to submit their comments by 5:00 p.m. on February 12, 2016. To use the Energy Commission's electronic commenting feature, go to the Energy Commission's webpage for this facility, cited above, click on the "Submit e-Comment" link, and follow the instructions in the on-line form. Be sure to include the facility name in your comments. Once submitted, the Energy Commission Dockets Unit reviews and approves your comments, and you will receive an e-mail with a link to them.

Written comments may also be mailed or hand delivered to:

California Energy Commission  
Dockets Unit, MS-4  
Docket No. 97-AFC-1C  
1516 Ninth Street  
Sacramento, CA 95814-5512

All comments and materials filed with the Dockets Unit will become part of the public record of the proceeding.

If you have any questions, please contact Joseph Douglas, Compliance Project Manager, at (916) 653-4677, or by fax to (916) 654-3882, or via e-mail at: [joseph.douglas@energy.ca.gov](mailto:joseph.douglas@energy.ca.gov).

If you would like information on participating in the Energy Commission's amendment process, please call the Energy Commission's Public Adviser's Office at (800) 822-6228 (toll-free in California). The Public Adviser's Office can also be contacted via e-mail at [publicadviser@energy.ca.gov](mailto:publicadviser@energy.ca.gov). News media inquiries should be directed to the Energy Commission Media Office at (916) 654-4989, or by e-mail at [mediaoffice@energy.ca.gov](mailto:mediaoffice@energy.ca.gov).

Enclosure

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High Desert Listserv

# HIGH DESERT POWER PROJECT (97-AFC-1C)

## Petition to Amend Commission Decision

### EXECUTIVE SUMMARY

Joseph Douglas

## INTRODUCTION

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On October 30, 2015 High Desert Power Trust, the owner of the High Desert Power Project (HDPP), filed a petition with the California Energy Commission (Energy Commission) requesting to amend the Final Decision for the HDPP. Enclosed is Staff's Analysis of this proposed change, submitted as Opening Testimony pursuant to the Committee's Order (TN# 207552). The 830-megawatt, combined-cycle power plant was certified by the Energy Commission on May 3, 2000, and began commercial operations in April 2003. The facility is located in the city of Victorville, in San Bernardino County.

The purpose of the Energy Commission's review process is to assess any impacts the proposed modifications would have on environmental quality and on public health and safety. The process includes an evaluation of the consistency of the proposed changes with the Energy Commission's Final Decision (Decision), and if the project, as modified, will remain in compliance with applicable laws, ordinances, regulations, and standards (LORS) (20, Cal. Code of Regs., § 1769).

This Staff Analysis (SA) contains the Energy Commission staff's evaluation of the affected technical area of **Soil and Water Resources**.

## DESCRIPTION OF PROPOSED MODIFICATIONS

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The modification proposed in the petition would allow HDPP to change Conditions of Certification **SOIL&WATER-1** to allow HDPP to use alternative water supplies other than State Water Project water (SWP) and recycled water from the Victor Valley Water Reclamation Authority.

## NECESSITY FOR THE PROPOSED MODIFICATIONS

Due to the statewide drought, SWP water was curtailed, and it is uncertain when it may become reliable again. The project has reported some issues with the use of recycled water and is requesting:

- The use of 3,090 AF per calendar year (calculated on a five-year rolling average) of ground water as a backup supply from the Mojave River Basin (MRB).

## STAFF'S ASSESSMENT OF THE PROPOSED PROJECT CHANGES

The technical areas contained in this Staff Analysis indicate recommended staff changes to the conditions of certification in the Final Decision. Staff believes that by requiring the proposed changes to the existing conditions, the potential impacts of the proposed changes would be reduced to less than significant levels. Staff's conclusions reached in each technical area are summarized in **Executive Summary Table 1**.

**Executive Summary Table 1  
Summary of Impacts to Each Technical Area**

TECHNICAL AREAS REVIEWED	STAFF RESPONSE			New or Modified Conditions of Certification Recommended
	Technical Area Not Affected	No Significant Environmental Impact or LORS noncompliance*	Process As Amendment	
Air Quality	X			
Biological Resources	X			
Cultural Resources	X			
Efficiency	X			
Facility Design	X			
Geological Resources	X			
Hazardous Materials Management	X			
Land Use	X			
Noise and Vibration	X			
Paleontological Resources	X			
Public Health and Safety	X			
Reliability	X			
Socioeconomics	X			
Soil and Water Resources			X	X
Traffic and Transportation	X			
Transmission Line Safety & Nuisance	X			
Transmission System Engineering	X			
Visual Resources	X			
Waste Management	X			
Worker Safety and Fire Protection	X			

\*There is no possibility that the modifications may have a significant effect on the environment and the modification will not result in a change or deletion of a condition adopted by the commission in the final decision or make changes that would cause the project not to comply with any applicable laws, ordinances, regulations, or standards (LORS) (20 Cal. Code Regs., § 1769 (a)(2)).

Energy Commission technical staff reviewed the petition to amend for potential environmental effects and consistency with applicable LORS. Staff has determined that the technical or environmental areas of Air Quality, Biological Resources, Cultural Resources, Efficiency, Facility Design, Geological Resources, Hazardous Materials Management, Land Use, Noise and Vibration, Paleontological Resources, Public Health and Safety, Reliability, Socioeconomics, Traffic and Transportation, Transmission Line Safety and Nuisance, Transmission System Engineering, Visual Resources, Waste Management, and Worker Safety and Fire Protection are not affected by the proposed

changes, and no revisions or new conditions of certification are needed to ensure the project remains in compliance with all applicable LORS.

Staff determined that the technical area of **Soil and Water Resources** would be affected by the proposed project change and has proposed revised conditions of certification to assure compliance with LORS and/or to reduce potential environmental impacts to a less than significant level. The details of the proposed condition changes can be found in the attached **Soil and Water Staff Resources Analysis**.

Based on staff's review, staff does not agree with the proposed amendment, as it relies on using the existing water treatment system and having access to large amounts of fresh water from the SWP and groundwater from the adjudicated MRB on a continuous basis for the life of the project. Long term use of fresh water violates state and Energy Commission water policies prohibiting use of fresh water supplies for power plant cooling unless it is environmentally undesirable, or economically infeasible to use other sources of water supply. Staff believes that the use of fresh groundwater in the amounts required from the MRB is environmentally undesirable since recycled water is available to the project, up to full load usage rates. The owner stated that it would be economically infeasible to retrofit HDPP water treatment facilities so that they can treat recycled water for consistent use at the project.

## **CONCLUSIONS AND RECOMMENDATIONS**

Staff concludes that use of 100 percent recycled water is a feasible alternative supply that would drought proof the project. Staff has proposed alternative language for **SOIL&WATER-1** that would ensure that the project makes full use of the recycled water supply while providing reasonable time to make the conversion and provide necessary backup supplies while the conversion is undertaken. Staff is also sensitive to the concerns about funding available for conversion of the project and identified areas where costs savings would be achieved when the conversion is completed. The condition would also ensure adequate mitigation for potential impacts to SWP and MRB.

Staff recommends the following for the HDPP to best drought proof the project and provide the project reliability that the owner and the rate payers expect:

- Eventual conversion to 100 percent recycled water;
- Termination of pretreatment and injection of SWP waters into the HDPP bank;
- Banking of SWP water in the MRB via Mojave Water Agency (MWA);
- Offset of any SWP water used at the project site or for the MWA bank; and
- Use of MWA groundwater only as an emergency backup supply, limited to a maximum of 1,600 AFY.

**HIGH DESERT POWER PLANT (97-AFC-1C)  
PETITION TO DROUGHTPROOF THE HIGH DESERT  
POWER PROJECT**

**Soil and Water Resources Staff Analysis / Opening Testimony  
Abdel-Karim Abulaban, Ph.D., P.E.**

**SUMMARY OF CONCLUSIONS**

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Staff reviewed the High Desert Power Project (HDPP) Petition to Amend (PTA) submitted by the project owner on October 30, 2015 seeking approval of the owner's proposed plan to drought proof the project. In accordance with California Environmental Quality Act (CEQA) Guidelines section 15162 (Cal. Code Regs., tit. 14, § 15162), staff concludes that the Committee may rely upon the environmental analysis of the 2000 Final Commission Decision, but supplementation is necessary for Soil and Water Resources.

Staff disagrees with the High Desert Power Plant (HDPP) PTA as requested, for the following reasons:

- It is incompatible with the State and Energy Commission policies on the industrial use of freshwater
- It does not drought proof the project as it still relies on State Water Project (SWP) directly, through their existing bank, or groundwater from the adjudicated Mojave River Basin (MRB) water as supplemented by SWP
- Use of fresh water or groundwater in the amounts required from the MRB is environmentally undesirable since recycled water is available to the project, up to full load usage rates
- The loading sequence proposed by the project owner does not address staff concerns regarding minimizing fresh water use as it is predicated on having access to large amounts of fresh water from the adjudicated MRB
- Staff showed in a previous analysis that use of recycled water for cooling purposes at the project is both environmentally desirable and economically feasible (CEC 2015d).

Staff recommends the following for the HDPP to best drought proof the project:

- Conversion of the project to 100 percent recycled water within a 3-year period;
- Allowing interim use of SWP water, banked SWP water, or MRB groundwater via the City of Victorville (CVV) adjudicated water rights during the 3-year conversion period;
- Allowing use of a backup supply after the conversion to 100 percent recycled water, made up of SWP water or banked SWP water via the existing bank or a bank developed in conjunction with MWA;
- Prohibiting use of adjudicated groundwater from MRB after conversion to 100 percent recycled water; and

- Implementation of a Water Conservation Offset Plan to reduce demand on the SWP equivalent to impacts created by the project use.

## INTRODUCTION

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As part of the Energy Commission's 2014 approval of the amendment for the HDPP to use water from the adjudicated MRB to supplement its fresh and recycled water supplies, the Energy Commission required HDPP to submit a PTA to drought-proof the project against an already unreliable fresh water supply from SWP, its primary water supply, by November 1, 2015, and to address the ongoing drought in California and the West. The intent of the 2014 approval (CEC 2014) was to give the project owner time to complete the feasibility study required in Condition of Certification **SOIL&WATER-1.f** (CEC 2009) showing what options could be utilized to convert to 100 percent recycled water use for project operation. Yet, the PTA proposes to use existing water supply and treatment systems with no significant changes to maximize the use of available recycled water. The project owner reiterated the same reasons that were cited in the feasibility study report as to why the project could not switch to 100 percent use of recycled water. Those reasons are summarized as follows:

- 1- Inadequate amount or quality of recycled water available to the project on an annual basis.
- 2- Inadequate capacity to supply the water at a rate and quality needed by the project 24 hours a day for all days of the year.
- 3- Onsite water treatment system was not designed to treat and remove the higher amount of impurities if 100 percent recycled water is to be used by the project.
- 4- The capital costs to upgrade the onsite water treatment system and to further treat the additional quantities of recycled water are extremely high.

The plan that the PTA proposes to make the project drought resistant is to use a combination of recycled water, SWP water, SWP water banked in the project's groundwater bank, and water from the MRB in proportions that make the blend suitable for operation of the project's water treatment system. The project owner proposed a loading sequence as an objective way to ensure that fresh water would only be used when needed, following certain criteria regarding total dissolved solids (TDS) and chloride concentrations in the cooling tower water. According to the proposed loading sequence, priority would be given to the recycled water, when available, followed by SWP water, if available, followed by SWP water in the project's groundwater bank, if available, followed by water from the adjudicated MRB.

The PTA is predicated on the assumption that the project would have access to a large amount of fresh water. There is nothing in the PTA about how the proposed loading sequence would ensure that use of fresh water would be limited to an upper maximum use, and how the project would stay within any maximum limits set for the project. Following is staff analysis of the PTA and staff recommendations.



## PROJECT DESCRIPTION AND BACKGROUND

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HDPP is an 830-megawatt natural gas-fired combined-cycle power plant located in the City of Victorville in San Bernardino County. The project uses the bulk of its industrial water in evaporative wet cooling towers. The project includes a zero liquid discharge (ZLD) system to treat and recover water from waste disposal streams.

HDPP has been operational since April 2003, and its primary water supply has been SWP surface water purchased from the City through a contract with the Mojave Water Agency (MWA). The MWA is a Long-Term SWP contractor with a full entitlement of 75,800 acre-feet (AF) of SWP water (CEC 2006 and DWR 2007, Table B-4). The HDPP has the potential to consume about 4,000 acre-feet per year (AFY) of raw water. Based on information provided by the project owner on the water use since operations commenced, the historic annual water consumption has been about 2,700 AFY. The average includes an extremely low consumption of only 1,368 for year 2011. Excluding that outlier, the adjusted average comes to about 2,900 AFY.

Drought and pumping constraints have resulted in fluctuations in SWP deliveries to MWA, which was foreseen by the original proceeding and 2000 Final Commission Decision (2000 Decision) (CEC 2000). From 2001 to 2005, deliveries of SWP water to MWA averaged less than 10,000 AFY (DWR 2007, Table B-5B). MWA expects SWP deliveries to continue to fluctuate for the next several years due to requests for additional water by other SWP contractors and insufficient yield from SWP conservation reservoirs (MWA 2005, Chapter 4). The California Department of Water Resources (DWR) administers the SWP. DWR's allocation of SWP water to contractors, including MWA, was reduced from five percent (5%) to zero percent (0%) on January 31, 2014 due to extreme water shortage. On April 18, 2014, DWR increased the allocation to contractors back to five percent (5%).

The project owner has been required to maintain a groundwater bank as backup for such anticipated delivery constraints. Contract SWP water from the City in excess of HDPP's operational needs is filtered by HDPP and injected into the underlying aquifer (groundwater bank) for retrieval for HDPP use when SWP water is not available. Currently, HDPP has only about 1,800 AF of available water in the bank, equivalent to about 60 percent of a year supply, at current HDPP capacity factors. The 2000 Decision had originally envisioned a bank of about 13,000 AF to address SWP delivery fluctuations.

### HDPP Water Supply Background

#### 2000 Decision (CEC 2000)

- Back up water supply - SWP water banked as groundwater, with 14,000 AF (13,000 AF and 1,000 AF of margin) to be banked by the end of the 5<sup>th</sup> year of operation (**SOIL&WATER-4.b** and **a**).
- The project shall not use treated water from the Victor Valley Wastewater Authority (**SOIL&WATER -1.d**) – conflicts with riparian uses in Mojave River.

- The project's water supply facilities shall be appropriately sized to meet project needs (**SOIL&WATER -1.e**).
- If there is no water available to be purchased from the MWA and there is no banked water available to the project ....no groundwater shall be pumped, and the project shall not operate. At the project owner's discretion, dry cooling may be used instead, if an amendment to the Commission's decision allowing dry cooling is approved (**SOIL&WATER -1.b**).

#### 2006 Order (CEC 2006)

- Require use of ultraviolet sanitizing as banking pre-treatment (**SOIL&WATER-1.b**).
- 13,000 AF (12,000 AF and 1,000 AF of reserve) to be banked by the end of the 15<sup>th</sup> year of operation (**SOIL&WATER-4.d, e and a**).
- Require Reverse Osmosis treatment if water banking amounts (14,000 AF by 15<sup>th</sup> year) are not met (**SOIL&WATER-1.d**).

#### 2009 Order (CEC 2009)

- Allowed use of recycled water from Victorville Wastewater Reclamation Authority plant (VWVRA) (**SOIL&WATER-1.a and c**).
- The project's water supply facilities shall be appropriately sized to meet project needs. The project shall make maximum use of recycled water for power plant cooling given the equipment capabilities and permit conditions (**SOIL&WATER-1.e**).
- Revised banking requirement to reflect recycled water use and reduced SWP water availability (**SOIL & WATER- 4.d**). Bank would be filled as much as possible up to 13,000 acre-feet (AF) until the planned future amendment for conversion to full recycled water use is received. Staff would further consider whether it would be appropriate to change or eliminate the water banking requirement at that time.
- Required feasibility study of using 100 percent recycled water, no later than December 31, 2011(**SOIL&WATER-1.f**).

#### 2011 Order (CEC 2011)

- Approval of extension of the due date for the feasibility study of using 100 percent recycled water to November 1, 2013. The order also approved moving the due date to the verification part of the condition of certification (**SOIL&WATER-1.f**).

#### 2013 Staff Approval

- Staff approval to extend the due date for the 100 percent recycled water feasibility study by one year to November 1, 2014. This was done as a staff approval that was communicated to the project owner via e-mail and was not required to be docketed because the due date was moved to the verification portion of the **SOIL & WATER- 1.f** condition of certification by the 2011 Order above.

## 2014 Order (CEC 2014)

- Allowed use of adjudicated MRB groundwater for a 2-year period as a backup supply during drought conditions and pending submittal of a PTA to convert to 100 percent recycled water use. (**SOIL&WATER-1**).
- Before use of MRB groundwater, HDPP is required to make maximum use of recycled water. Where adequate recycled water is not available then SWP and/or banked SWP and/or MRB groundwater can be used. The project may use up to 2,000 acre feet of MRB groundwater in either of water year 2014/2015 or 2015/2016.
- Require submittal of the subject PTA to drought proof the project and ensure consistency with state water policy or convert to dry cooling.

## **ANALYSIS OF PROPOSED MODIFICATION**

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In assessing the impacts of the proposed amendment elements, staff reviewed the project's 2000 Decision (CEC 2000), subsequent amendments, and information provided by the project owner in support of the proposed amendments. The scope of staff's analysis is to evaluate whether the proposed changes would have any adverse environmental impacts and if they would be consistent with applicable laws, ordinances, regulations and standards (LORS) and state water policies. Where potential impacts have been identified or LORS compliance was required, staff proposed appropriate mitigation and changes to the conditions of certification. Staff also evaluated the project owner's proposed modifications and proposed changes to Condition of Certification **SOIL&WATER-1**.

### **Changes in Project Water Supply**

While staff agrees with the owner that supply and quality from the SWP has been variable, staff disagrees with the owner that the variability and limitations on the supply are changed conditions that were not anticipated in the 2000 Decision. The 2000 Decision and Condition of Certification **SOIL&WATER-1** are evidence that if the primary supply (SWP) and the backup supply from a bank of injected SWP water were inadequate for project operation due to variability, the project could not pump MRB groundwater because of basin overdraft impacts.

During the 2000 permitting process the Applicant addressed staff concerns about water supply by vowing to not seek any other water supplies, and to shut down the plant if it lost the water supply from SWP, resulting in **SOIL&WATER-1**. Staff notes that in 2006, interests in the power project were bought by TPF Generation Holdings, LLC, from the Applicant (original owner), Constellation Power, Inc. The terms of the purchase included provisions that TPF Generation Holdings, LLC assume all obligations, including compliance with all conditions of certification of the original license. Compliance with all conditions of certification was also a requirement in the Commission's approval of the plant's change in ownership. Since some of the same board members that bought the project were also on the board of the original company, staff asserts that the project owner was aware of the 2000 Decision water supply requirements.

During the licensing process in 1999 and 2000, the issue of water availability was extensively debated because the project was proposed to be constructed in a desert environment where water resources are limited. Due to the limited water supply in the region, the project was permitted to use imported SWP water as its main source of water and was prohibited from using other sources of water such as local groundwater because of overdraft in the Mojave River groundwater Basin (MRB). The 2000 Decision prohibited the project from using local reclaimed wastewater (recycled water) because it was discharged to the Mojave River to maintain riparian habitat as required by the California Department of Fish and Wildlife (DFW, formerly DFG). Since that time, an excess recycled water supply has become available and has provided HDPP a feasible and more preferable alternative supply than complying with the original Condition of Certification **SOIL&WATER-1**, which would have otherwise required conversion to dry cooling or shutting down.

### **Banking for Backup Water Supply**

In case the SWP water supply was interrupted for any reason, the project was required in the 2000 Decision to create and maintain a groundwater bank for backup by injecting surplus SWP water into a subsurface bank. The project was required to inject an amount of water sufficient to satisfy project needs for three years in case supply from the SWP was completely curtailed. Initially, the project was required to fill the bank in five years. The three-year supply was based on the duration of the longest drought on the record in the state of California at the time the project was licensed. Since the design basis water consumption for the project was 4,000 AFY, the amount of water to be stored in the groundwater bank was determined to be 12,000 AF, plus 1,000 AF as a reserve to be left in the bank. The project was also required to account for dissipation from the aquifer to the Mojave River by injecting an amount of water equal to what has been dissipated to the river. The amount of dissipated water is determined using a groundwater numerical model constructed for that purpose. If the project pumps any of the water from the bank because SWP water is not available, it has been permitted to replace that amount as soon as SWP water delivery is restored and there is surplus water of suitable quality for injection so that the 3-year supply is maintained in the bank. The exception to that is when the project is 3 years away from its design life when it will be allowed to terminate replacement of water pumped from the bank.

However, due to issues with the availability of SWP water in sufficient quantity and quality for injection, and the fact that HDPP had to be online and operating to be able to inject, the project owner claimed in 2009 that the project was not able to accumulate the amount of water required to maintain in the bank. The maximum amount that the project had in the groundwater bank at any point since it was established was 5,185 AF, which occurred in the third quarter of 2012. Subtracting the 1,000-AF reserve, the amount available to the project was 4,185 AF, which was just over one year of supply based on the project's design water use.

In 2009, staff agreed to change the banking requirement acknowledging the project owner's claim that even during non-drought years the project was not able to bank the water it needed. Also, with the use of the more dependable recycled water supply, it

was possible to make the banking requirements more flexible while the project owner conducted the feasibility study and submitted the PTA to convert to 100 percent recycled water use.

In light of the severe drought that the State has been experiencing for the past four years, the use of recycled water instead of fresh water is consistent with the Governor's Executive Order B-29-15, which proclaimed a state of emergency throughout California due to severe drought conditions.

### **Recycled Water Supply**

In 2009, the project owner petitioned the Energy Commission to use recycled water at HDPP. The 2009 petition was submitted after the Victorville II (VV2) power plant project, which was certified by the Energy Commission to use recycled water for its operations, was unable to proceed<sup>1</sup> and thus made available the recycled water amount that was dedicated for VV2. The Energy Commission approved the HDPP owner's petition (CEC 2009). Since the recycled water is of different quality than the SWP water, staff acknowledges that it can affect the performance and efficiency of treatment facilities designed to treat the SWP water. Use of recycled water can also reduce the number of concentration cycles in the cooling tower, thereby slightly increasing the amount of water needed for project operation. Recognizing these effects, the Energy Commission recommended in 2009 that the project owner conduct a feasibility study to determine what would be needed for the project to switch to 100 percent recycled water for its operations (CEC 2009).

The feasibility study was initially due in November 2011. The Energy Commission approved two extensions of the feasibility study deadline as requested by the project owner: first until November 2013 (CEC 2011), and then until November 2014. The owner stated that the recycled water producer, VVWRA treatment plant, could not provide recycled water to the project for two consecutive summer seasons so they could adequately test feasibility.

In April 2014, due to curtailment of water delivery from SWP caused by the drought, the project owner petitioned the Energy Commission to allow the use of groundwater from the adjudicated Mojave River Basin<sup>2</sup> as a backup supply. The Energy Commission 2014

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<sup>1</sup> The VV2 project had its start of construction date extended by the Energy Commission to July 16, 2018 – if the project ever proceeds to construction, most of its conditions of certification, including water supply would have to be revisited to address changes in LORS and setting.

<sup>2</sup> The Mojave River Basin has been under adjudicated groundwater management since 1993 where withdrawals are allowed for groundwater-right holders based on past uses. Under the adjudication, withdrawals are being ramped down each year, and State Water Project water is being imported in an attempt to stabilize water levels in the basin. While VVWRA is not a party to the adjudication, its recycled water is discharged to the Mojave River to maintain shallow groundwater and surface water flows that sustain valuable riparian habitat. Under a 2003 MOU between California Department of Fish and Wildlife (DFW, formerly DFG), which is a party to the adjudication, VVWRA provides not less than 9,000 AFY and “not less than twenty percent (20%)” of increases that occur from regional growth of sanitary wastewater to the river. Also, the amount of recycled water to the river would be adjusted based on measured Mojave River flows at the ‘Lower Narrows’ gauge, allowing for credit to be given to VVWRA as the natural river flows improve, either due to the adjudication or hydrologic conditions.

Order for that petition permitted HDPP to acquire local Mojave River Basin groundwater as a backup supply of no more than 2,000 AFY in water year 2014/15 and in water year 2015/16, while requiring the project owner to submit a Petition To Amend by November 1, 2015 to identify reliable primary and backup water supplies, or to “drought proof” the project.

The project owner submitted the subject feasibility study report to the Energy Commission on November 3, 2014. The conclusion of the project owner’s feasibility report was that the project could not switch to using 100 percent recycled water for its operation because the supply was not reliable and the necessary water treatment upgrades were economically infeasible for the owner. Staff did not agree with the conclusions of the feasibility report and prepared an analysis of the project owner’s claims. Staff also conducted independent analysis of the facts regarding the quantity and quality of recycled water and the feasibility for project use (CEC 2015d).

In the following sections, staff presents analysis and conclusions concerning the present PTA. This analysis focuses on the following claims by the project owner and presents additional independent analysis of the feasibility for the use of 100 percent recycled water.

- 1- **Basis for the PTA is unforeseen information that was not known to the project owner.** This is hardly accurate, since, as mentioned above, the issue of the vulnerability of the project’s water supply was extensively discussed during the licensing proceedings for the project in 1999 and 2000, and the vulnerability was acknowledged by the project owners on more than one occasion. The Commissioners addressed the risk of the interruption of the primary water supply (SWP) by requiring the project to develop a groundwater injection plan to bank a backup supply adequate to fully supply the project for up to 3 full-load years. The 2000 Decision further clarified that in the event the primary supply or backup supply was not available the project would either shut down or convert to dry cooling. The 2000 Decision stated that no groundwater could be pumped, and, at the time, no recycled water could be used, due to potential impacts on the MRB.
- 2- **Adequacy of the amount of recycled water from the VVWRA and the Industrial Wastewater Treatment Plant (IWWTP).** As discussed in the staff’s response to the feasibility study report, the net amounts of recycled water available to the project from VVWRA plant alone are more than sufficient to meet project needs for more than 7 out of every ten years given the historic maximum amounts the project has used so far. Additionally, according to new information provided by the project owner’s consultant, GSI, Inc., (HDPP 2015) VVWRA plant has started to divert 1.2 MGD (approximately 1,340 AFY) of influent domestic wastewater to the IWWTP. Combined with the 0.5 MGD (560 AFY) that the IWWTP was producing before the diversion, that brings the total effluent from the IWWTP to 1.7 MGD (2,040 AFY). Since domestic wastewater is typically lower in TDS than the primarily industrial wastewater discharged from a Snapple juice plant to the IWWTP, the diversion is expected to result in diluting the TDS levels in the IWWTP’s effluent so that it is within the contractual specifications for HDPP.

Furthermore, as discussed in the staff's response to the feasibility study report, the City has requested the Snapple plant to perform pretreatment on its wastewater to reduce TDS levels before discharging it to the IWWTP. As discussed in the staff's response to the feasibility study report, the lowest projected net amount of recycled water from the VVWRA plant is 2,600 AFY. With the addition of the 560 AFY from the IWWTP as a result of the diversion of the 1,340 AFY of domestic wastewater from the VVWRA plant, the lowest projected amount goes up to 3,140 AFY, which is more than the historic average amount of water used by the project since it started operations, and within 3 percent of the maximum annual amount the project has used.

- 3- **Treatment capacity of existing equipment:** The project owner reiterated statements from the feasibility study report that existing treatment equipment were designed to treat SWP, not recycled water, which contains more constituents that cause microfiltration components to clog more often. The project owner stated that it does not have the capital required to add more treatment capacity to deal with the fouling constituents in the recycled water. However, staff notes that recycled water is currently being used in an economically feasible and efficient manner at seven other power plants that employ ZLD systems to manage their industrial wastewater (**Soil & Water Resources Table 1**). Six of the seven power plants listed in **Soil & Water Table 1** use 100 percent recycled water, while the seventh one, Mountainview plant, uses a combination of recycled water and impaired groundwater that contains a number of contaminants that the project must treat before it can be put to operational use. In fact, the Russell City Energy Center project treats secondary wastewater to tertiary levels on site for project use and to meet offsite demand. This requires significantly more treatment than what would be required by HDPP.
- 4- **Availability of water from the adjudicated MRB:** The project owner believes that the adjudication plan has been successful in balancing the MRB, especially the Alto sub-basin, where the project is located, and thus excess water is available for long term use by the project. Staff held one of many phone conferences with MWA, the appointed watermaster for the adjudicated MRB, and the City of Victorville on December 22, 2015. Representatives of MWA informed staff that their understanding from the project owner was that the project would seldom require the use of up to 3,090 AFY of groundwater from the MRB. However, MWA was unaware that the proposed plan essentially allowed the project to use up to 3,090 AFY in every year if the owner decided it was needed. MWA indicated that if this were the case they would not want a possibly firm use of MRB groundwater allowed. Instead, they indicated a willingness and preference to maintain a bank (e.g., the one under the control of HDDP) the way it was originally designed for use as a backup source.

The MWA representatives also informed staff that the agency would be willing to transfer the amount of water currently in the injection water bank and issue credit for the project to be used from the MRB. In fact, the MWA representatives indicated that

they would be in favor of taking SWP water acquired by the project and percolating it to the groundwater basin instead of the project injecting it in its current injection groundwater bank. This would give MWA the flexibility to percolate the water in areas where it is needed most. This would also allow the project owner to avoid treatment of SWP water before injection, and maintenance of the water injection banking program. This would result in cost reductions to the project by allowing banking any time water is available. It would also eliminate the need to have HDPP operating, which is a limitation of the existing banking scheme.

- 5- **Revival of the VV2 Power Project:** Again, the owner raised the possibility that the VV2 project might be constructed, thereby reducing the amount of recycled water available to the project. As was discussed in the staff's response to the feasibility report, VV2 is unlikely to be built, and not without reopening the permit. The technology, impacts, mitigation, Decision, and findings are all quite stale. The recycled water is not contractually committed to VV2, and therefore, is available to HDPP. (CEC 2015d, page 7)
- 6- **The Project owner failed to store enough water in the groundwater bank:** As mentioned above, the project owner has been required by the 2000 Decision to establish and maintain a groundwater bank to store SWP water after proper treatment as backup in case of interruptions in supplies from the primary source of water supply for the project. The project owner failed to inject the initial required amount of water in the bank, even though surplus water was acquired from SWP as shown in Table 1 of GSI's attachment (HDPP 2015). The table in reference shows that the project's requested allocations of 8,000 AFY of water from the SWP in the years 2004, 2005, 2006, and 2007, and 6,500 AFY in the years 2011, 2012, and 2013 were approved. However, the project injected less than 1,000 AFY during those years, with the exception of year 2006 where the project injected 1,431 AF. It is only after review of the information in GSI's Table 1 that staff realized that the project could have been banking far more water than was actually banked. This fact was also affirmed by MWA in the December 22, 2015 meeting with staff when they informed staff that when water was available, the project owner did not take advantage of it to store the required amount in the bank (CEC 2016).

In 2009, staff worked with the project owner to revise the banking requirement and reflect the use of recycled water that became available in 2009 while allowing the project to bank as much water from the SWP as feasible up to 13,000 AF. Had the project owner taken advantage of the available supply since 2004, it could have satisfied the requirement to achieve the required amount of water in the water bank, and significantly mitigated the current water supply predicament.

- 7- **MRB water is of consistently high quality:** In the current PTA, the project owner presented a number of arguments why the MRB is the more favorable source of water compared to the SWP water for blending with the recycled water. One argument made by the project owner is that the MRB water is the best quality water to blend with the recycled water, and thus less water would be needed than the



lower quality water from the SWP. The project owner also stated that the MRB is the most reliable and steady source of water. However, the cost of the water from the MRB is the highest, which, according to the project owner, is a factor that will cause the project owner to use as little of that water as possible.

**Soil & Water Resources Table 1 Jurisdictional Power Plants that Use Recycled Water for Operational Needs and a ZLD System to Process Industrial Wastewater**

Plant Name	County	Capacity (MW)	Average Capacity Factor (2010 - 2013)	CTG Size	STG Size	Cooling Tower Size	Primary Water Supply Type	Backup Water Supply Type	Average Water Use (afy) (2010 - 2013)	Approximate Water TDS (mg/L) in 2014	Equipment
Gilroy Energy Center	Santa Clara	142	4%	3 units, each 47.3 MW	None	3 cells	Recycled Water, Groundwater	Groundwater	33	Not Reported	ZLD
Magnolia	Los Angeles	310	44%	1 unit, 198.9 MW	1 unit, 188.7 MW	6 cells	Recycled Water, Groundwater	Colorado River and SWP	867	650	ZLD
Mountain-View	San Bernardino	1,054	62%	2 units, combined cycle single shaft, each 527 MW		20 cells	Recycled / Contaminated	Recycled / Contaminated	4,286	275	Brine Concentrator
Riverside Energy Center	Riverside	192	3%	4 units, each 48 MW	None	6 cells	Recycled	Recycled	6	651	ZLD
Roseville Energy Park (REP)	Placer	200	25%	2 units, 50 MW each	1 unit, 100 MW	4 cells	Recycled	Folsom Lake and City of Roseville wells	392	514 (based on reported conductivity of 770 $\mu$ mho/cm)	ZLD
Russell City	Alameda	600	24%	2 units, 195 MW each	1 unit, 250 MW	9 cells	Recycled	Hetch Hetchy watershed and Alameda watershed	1,647	479	ZLD / City of Hayward Sewer
Walnut Energy Center	Stanislaus	250	63%	2 units, 80 MW each	1 unit, 90 MW	5 cells	Recycled	Groundwater	1,152	680	ZLD

## **Project Financial Situation**

Project representatives have indicated to staff that the owner of the HDPP, High Desert Power Trust, LLC, does not have the requisite funds for capital projects. The representatives have also indicated that their company's organizational and financial structure limits access to funds for capital improvements necessary to implement water treatment system improvements that they assert are necessary to use recycled water up to 100 percent. Prior to the assignment of the Committee, the project owner's representatives asserted these points at a January 7, 2016 meeting with Energy Commission staff. Subsequent to this meeting, the project owner docketed a request for confidential designation for submitted financial records (TN# 207311). A final determination of whether a confidential designation will be granted by the Commission's Executive Director has not been made by the time of publishing staff's Opening Testimony, so staff lacks an awareness of what was docketed and therefore has not been able to determine whether the project owner has access to funds that could be used to finance construction of water treatment facilities to use 100 percent recycled water.<sup>3</sup>

## **Project Owner's Proposed Loading Sequence:**

The project owner proposed a loading sequence as an objective way to ensure that fresh water would only be used when needed to produce a blend of water suitable for the cooling tower given the existing equipment. The loading sequence uses criteria related to the cooling tower blowdown rate, which is related to the TDS in the cooling tower water, and chloride concentrations in the cooling tower water, such that when those criteria are exceeded, water of better quality is used for blending to improve the quality of the circulating water in the cooling tower. The loading sequence prioritizes water from the proposed four sources, where the first priority is given to the recycled water, followed by SWP water when available, followed by banked SWP water when available, followed by the MRB water.

The proposed loading sequence represents a fundamental disagreement between staff and the project owner. Staff concludes the project owner should be required to convert to 100 percent recycled water use because there is an adequate supply of sufficient quality to be used in an economic manner that would have significantly greater environmental benefits consistent with Energy Commission and State policies. Because the project owner believes the conversion to a drought resistant 100 percent recycled water supply is too expensive, the project owner plans to only use the current water treatment equipment to be able to use an undefined amount of recycled water, while using a discretionary method to blend fresh water sources as needed to stay under a maximum constituent level in the cooling tower waters.

Beyond this proposal not acknowledging the availability of a drought resistant alternative supply and maximizing its use through modifications and expansions of the

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<sup>3</sup> Prior to the January 7, 2016 meeting the project owner provided staff draft financial documents, which were treated as confidential and returned pursuant to Title 20, California Code of Regulations, section 2505(a)(6).

project, staff is particularly concerned about the project owner's request that the project have access to a rather large amount of fresh water from the MRB for the remaining project life. Also, the proposed loading sequence does not include any provisions that limit use of the fresh water to the maximum that staff is proposing. Rather, it is designed to bring in water of better quality whenever certain criteria for the cooling tower water are met. It relies on the assumption that the project would have access to up to 3,090 AFY of water from the MRB. Staff believes that this could result in significant impacts to the MRB. Also, staff would have no control on how the loading sequence would be implemented in the field and would not be able to monitor its implementation in real time. All staff would receive is after-the-fact information about what had been done and the owner's interpretation of what was required for blending and how it was conducted.

And since the petition does not propose even a minimum amount of recycled water use over any time period, all staff is left with is the intent of the project owner to use as much recycled water as feasible. Staff does not believe that the proposed loading sequence is consistent with the intent of the Commission Decision and subsequent amendments, and current state and Energy Commission water policy. Staff proposes a new condition of certification requiring use of 100 percent recycled water as discussed below.

## **LORS ANALYSIS**

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The Energy Commission has adopted the 2003 IEPR water policy since licensing of the project in 2000 and significant new guidance has been provided to staff through Energy Commission decisions analyzing how it should apply to project cases. Staff has provided an updated analysis of state water law and policies that apply to this project. Staff also provides a brief outline of the regulations that would specifically apply to recycled water use and discusses how it is interpreted to apply to this project.

### **State Regulations:**

*Water Code Section 13550.* "The Legislature hereby finds and declares that the use of potable domestic water for non-potable uses, including, but not limited to, cemeteries, golf courses, parks, highway, landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available which meets all of the following conditions, as determined by the State Board." This section requires the use of recycled water for industrial purposes subject to recycled water being available and upon a number of criteria including: provisions that the quality and quantity of the recycled 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. All of these conditions are satisfied for delivery of recycled water from VVWRA treatment plant to HDPP as demonstrated in "Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report" (CEC 2015d).

*Water Code Section 13551.* This section prohibits a person or public agency, including a State agency, city, county, city and county, district, or any other political subdivision of the State, shall not use water from any source of quality suitable for potable domestic

use for non-potable uses if suitable recycled water is available as provided in Section 13550. SWP is used as domestic supply for 2/3 of the population of the state of California. The portion of the MRB that would serve the project is in the Victorville area. The MRB is the primary domestic water supply in this area. Recycled water is available as demonstrated in “Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report” (CEC 2015d) and as provided in Section 13550.

*Water Code Section 13552.* This section specifically identifies the use of potable domestic water for cooling towers as unreasonable use of water within the meaning of Article X Section 2 of the California Constitution, if suitable recycled water is available and the water meets the requirements set forth in Section 13550. Recycled water is available as demonstrated in “Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report” (CEC 2015d) and as provided in Section 13550.

### **Energy Commission Policy**

The Energy Commission has five sources for statements of policy relating to water use in California applicable to power plants. They are the California Constitution, the Warren-Alquist Act, the Commission’s restatement of the State’s water policy in the 2003 Integrated Energy Policy Report (IEPR), the State Water Resources Control Board (SWRCB or Board) resolutions (in particular Resolutions 75-58 and 88-63), and the Genesis Solar Project Committee’s water-issues order as guidance for interpreting all of the above.

### **California Constitution**

Article X, section 2 prohibits the waste or unreasonable use, including unreasonable method of use, of water, and it requires all water users to conserve and reuse available water supplies to the maximum extent possible (Cal. Const., art. X, § 2). Use of surface water from the Sacramento-San Joaquin Delta through the State Water Project is subject to reasonable use. Use of groundwater from the MRB is subject to reasonable use.

### **Warren-Alquist Act**

Section 25008 of the Energy Commission’s enabling statutes echoes the Constitutional concern, by promoting “all feasible means” of water conservation and “all feasible uses” of alternative water supply sources (Pub. Resources Code § 25008). Adequate recycled water supply is now available for project use (CEC 2015d).

### **Integrated Energy Policy Report**

In the 2003 Integrated Energy Policy Report (IEPR or Report), the Energy Commission reiterated certain principles from SWRCB’s Resolution 75-58, discussed below, and clarified how they would be used to discourage use of fresh water for cooling power plants under the Commission’s jurisdiction. The Report states that the Commission will approve the use of fresh water for cooling purposes only where alternative water supply sources or alternative cooling technologies are shown to be “environmentally undesirable” or “economically unsound” (IEPR (2003), p. 41). In the Report, the

Commission interpreted “environmentally undesirable” as equivalent to a “significant adverse environmental impact” under CEQA, and “economically unsound” as meaning “economically or otherwise infeasible,” also under CEQA (IEPR, p. 41). CEQA and the Commission’s siting regulations define feasible as “capable of being accomplished in a successful manner within a reasonable amount of time,” taking into account economic and other factors (Cal. Code Regs., tit. 14, § 15364; tit. 20, § 1702, subd. (f)). Since the project was licensed, 7 projects are using either recycled water or a combination of recycled water and impaired groundwater for wet cooling and managing wastewater with a zero liquid discharge system (**Soil and Water Resources Table 1**).

### **State Water Resources Control Board Resolutions**

In the SWRCB’s updated Recycled Water Policy (Resolution No. 2009-11 and as amended in 2013), it was declared that “California is facing an unprecedented water crisis. The collapse of the Bay-Delta ecosystem, climate change, and continuing population growth have combined with a severe drought on the Colorado River and failing levees in the Delta to create a new reality that challenges California’s ability to provide the clean water needed for a healthy environment, a healthy population and a healthy economy, both now and in the future. These challenges also present an unparalleled opportunity for California to move aggressively towards a sustainable water future.” The purpose of the Policy is to increase the use of recycled water from municipal wastewater. To achieve this result the SWRCB has set an aggressive goal to increase the use of recycled water over 2002 levels by at least one million AFY by 2020 and by at least two million AFY by 2030. Converting HDPP, a single project using up to 4,000 AFY, to recycled water use would be a substantial contribution towards achieving this goal.

The SWRCB not only considers quantity of water in its resolutions, but also the quality of water. In 1975, the Board adopted the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Power Plant Cooling (Resolution 75-58). In it, the Board encourages the use of recycled water for power plant cooling. It also determined that water with a TDS concentration of 1,000 mg/L or less should be considered fresh water (Resolution 75-58). One express purpose of that Resolution was to “keep the consumptive use of fresh water for power plant cooling to that minimally essential” for the welfare of the state (Ibid; emphasis added). The SWP water and MRB groundwater that the project owner proposes to use contain generally less than 500 mg/l TDS. They are high quality sources of freshwater. Even the recycled water supply generally has concentrations at or below 500 mg/l TDS.

In 1988, the Board determined that water with TDS concentrations of 3,000 mg/L or less should be protected for and considered as potential supplies for municipal or domestic use unless otherwise designated by one of the Regional Water Quality Control Boards (Resolution 88-63).

## **Order from the Genesis Solar Project Committee**

The Genesis Solar Project Committee considered all these sources of policy to arrive at a simple, yet flexible, determination for water use by power plants under Commission jurisdiction. The Order states:

The Committee reads [the policies] as requiring projects seeking to use groundwater for power plant cooling to use the least amount of the worst available water, considering all applicable technical, legal, economic, and environmental factors (CEC 2010). In the Genesis Solar Energy Project case the project owner was proposing the use of groundwater for project operation. In this case the project owner is proposing to use both high quality groundwater and surface water.

Staff carefully considers all relevant factors when conducting analysis and arriving at recommendations for the Commission. Thus, staff must determine what is the least but nevertheless feasible amount of water available for use, and also the worst, feasibly available water for use for a project.

In several cases, the Commission has accepted conservation programs that conserve water in the region as means of accepting compliance with the water policies. Staff agrees that such conservation programs are an acceptable method to ensure compliance for current projects, although less desirable than avoiding the use of fresh water for cooling altogether. Where any freshwater is used for project operation, staff concludes that such water use should be offset consistent with other cases regardless of what role it plays for project supply.

## **Proposed Use of Freshwater by HDPP**

To summarize, the project owner proposes to use recycled water given the current capacity of their zero liquid discharge system with no expansion to use 100 percent recycled water. The project could use up to about 4,000 AFY (i.e., 100 percent capacity factor) of combined sources of recycled water, SWP water, banked SWP water, and MRB groundwater. The project owner proposes use of up to 3,090 AFY of SWP water, banked SWP water, or MRB groundwater for dilution of recycled water such that blowdown from the wet cooling tower is maintained at or below 980 mg/l chloride and a preset maximum cooling tower blowdown (CT Blowdown) rate determined as a function of the TDS in the circulating water. This would essentially be more freshwater than what the project has consumed on an annual basis for most the years since it commenced operation.

In 2014, the project was permitted to use MRB for backup supply for a 2-year period to ensure operation during the current drought (CEC 2014). Under the adjudication managed by MWA, the project owner is permitted to purchase groundwater from the MRB for this short term use. MWA has a fee structure for the adjudicated groundwater from MRB that funds purchase of water for recharge of the groundwater basin. A primary source of water for recharge using these funds is SWP. The MRB and SWP are directly linked in this way. Overdraft in the MRB has been somewhat stabilized but not completely recovered through recharge of the MRB with SWP.

As demonstrated in the analysis above, the reliability of SWP has significantly diminished. It is the reason the owner has filed this PTA. The Sacramento-San Joaquin Delta is in crisis. The demand for SWP in normal and dry years has exceeded the ability of the Delta to sustain multiple human uses while at the same time preserving what environmental resources remain.

The overdraft of the MRB is the basis for the adjudication agreement used to operate and sustain supply for the basin. Without adequate SWP supply to recharge the MRB or by allowing continued direct use of MRB, this would fix firm demand from HDPP on either of these supplies. This would be environmentally undesirable and therefore inconsistent with Energy Commission policy. Currently, potential impacts to the MRB remain, and continued use of this resource could result in significant impacts to MRB since there is limited SWP for purchase and recharge of the MRB. Recycled water is available in sufficient quantities and quality for project use.

Staff concludes that the proposed water supply does not comply with the state's water policies as detailed above. While proposing to use some relatively poorer quality water (recycled water), and possibly the worst quality water reasonably available for the purposes of the project, the proposed project fails to use the least amount of freshwater feasible. Staff concludes that the applicant has not demonstrated that conversion to 100 percent recycled water is infeasible. Therefore, staff recommends that the Commission adopt the revised Condition of Certification **SOIL&WATER-1**, which staff proposes to replace the existing condition. The new condition of certification requires the following:

- 1) Conversion of the project to use 100 percent recycled water within a 3-year period;
- 2) Allowing interim use of SWP, banked SWP, or MRB via CVV adjudicated water rights during the 3-year conversion period;
- 3) Allowing use of a backup supply after the conversion, made up of SWP water or banked SWP water via the existing bank or a bank developed in conjunction with MWA;
- 4) Prohibiting use of adjudicated groundwater from MRB after conversion to 100 percent recycled water; and
- 5) Implementation of a Water Conservation Offset Plan to reduce demand on the SWP equivalent to impacts created by the project use.

## **WATER SUPPLY ASSESSMENT**

### **California Water Code, Sections 10910-10915 (Senate Bill 610)**

Since the project is proposing a potentially fixed demand of 3,090 AFY from the MRB, staff concludes that this should be interpreted as a new water supply for the project that is in addition to the SWP and banked SWP supply currently permitted for project operation. Accordingly, staff concludes that a Water Supply Assessment (WSA) in accordance with California Water Code Sections 10910-10915 is necessary.



Water supply assessments are intended to inform CEQA decision-makers about project water supplies and their availability. The California Department of Water Resources (DWR) Senate Bill 610 Guidebook provides general guidance about how to interpret Water Code Sections 10910-10915. The central theme of the Guidance is that WSAs are necessary for projects that substantially increase the potable water demand on a local system. The Guidebook discusses how to manage water supplies and how to appropriately project future demands on the water supply system with the next 20 years when considering new developments. Ultimately, the WSA should provide evidence that verifies the sufficiency of or the deficiencies in a project's water supply while ensuring there is an adequate supply for existing users and future demand.

## **Required WSA Elements**

### **Is HDPP PTA a "project" under SB 610?**

Any CEQA project that meets the Water Code Section 10912 definition of a "project" requires the preparation of a WSA. Section 10912 identifies a "project" as meeting one of the following definitions excerpted from the water code and listed below. Staff bolded the only definitions that could clearly apply to HDPP; the other definitions are not tested here and do not require further explanation.

*10912. For the purposes of this part, the following terms have the following meanings:*

*(a) "Project" means any of the following:*

- (1) A proposed residential development of more than 500 dwelling units.*
- (2) A proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space.*
- (3) A proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space.*
- (4) A proposed hotel or motel, or both, having more than 500 rooms.*
- (5) **(A) Except as otherwise provided in subparagraph (B), a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.***  
*(B) A proposed photovoltaic or wind energy generation facility approved on or after the effective date of the amendments made to this section at the 2011-12 Regular Session is not a project if the facility would demand no more than 75 acre-feet of water annually.*
- (6) A mixed-use project that includes one or more of the projects specified in this subdivision.*
- (7) **A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.***

*(b) If a public water system has fewer than 5,000 service connections, then "project" means any proposed residential, business, commercial, hotel or motel, or industrial development that would account for an increase of 10 percent or more in the number*

*of the public water system's existing service connections, or a mixed-use project that would demand an amount of water equivalent to, or greater than, the amount of water required by residential development that would represent an increase of 10 percent or more in the number of the public water system's existing service connections.*

There are two “project” definitions that require further consideration. First is (5)(A), which states,

- (5) *(A) Except as otherwise provided in subparagraph (B), a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area.*

This definition would not apply to HDPP because the project site is 25 acres.

The other project definition that requires additional discussion is item (7), which would require a WSA if a project used an amount of water equivalent to a 500 dwelling unit project.

- (7) *A project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.*

Guidance for interpreting Water Code Section 10912 is provided in a California Department of Water Resources (DWR) document titled “Guidebook for Implementation of Senate Bill 610 and Senate Bill 221 of 2001 (DWR2003).” A helpful interpretive section on page 3 of the Guidebook, explains how to estimate water consumption for 500 dwelling units. It states that one dwelling unit typically consumes 0.3 to 0.5 afy (DWR2003). Therefore 500 dwelling units could be interpreted to mean 150 to 250 afy. The project’s use of 3,090 AFY far exceeds the trigger for the requirement to prepare a WSA.

HDPP is a “project” under SB 610.

**Will the project rely on groundwater? If so, what is the source?**

Yes, the project would rely on up to 3,090 AFY of SWP and/or groundwater pumped from the MRB.

**Are there sufficient water supplies to serve the project during normal, dry, and multiple dry-year scenarios?**

No, as indicated in the analysis above the project would continue to rely on SWP and proposes additional use of MRB groundwater where SWP is not available. The reason the project owner has filed this PTA is that the SWP has been and is increasingly unreliable. The state is currently undergoing a historical multiple dry year period. The project was originally required to maintain 13,000 AF of banked SWP after a 5-year period commencing from initial operation in 2003. The project has not attained that requirement and staff has had to revise the project license to accommodate the lack of banked SWP supply. The project is currently vulnerable even in a single dry year period as evidenced by the emergency order request by the project owner to use MRB for the

2-year period expiring on September 30, 2016. Continued use of SWP is not sustainable.

Facing this ongoing reality the project owner now proposes to shift demand when needed to the MRB. The MRB is in overdraft and is currently managed in accordance with the "Judgment After Trial," dated January 1996, which is a governance structure specifically designed to manage the overdraft in the MRB and ensure a sustainable supply for stipulated parties. In effect, this shift maintains continued demand on SWP supplies because they are relied on for recharge and maintaining groundwater levels in the adjudicated MRB.

During initial licensing of the project, MWA advocated use of SWP and banking of SWP because they did not feel a fixed demand on the MRB at the time was appropriate due to overdraft conditions. They also supported the use of a bank because of the concern in reliability of SWP deliveries even at that time. MWA still maintains this position but is willing to provide MRB on a limited emergency basis for project operation (CEC 2016).

MWA has a mechanism to assess fees to MRB groundwater users which can be used to purchase additional water for recharge and replacement of groundwater consumed in excess of adjudicated rights. HDPP would purchase groundwater from MRB through CVV adjudicated water rights and they would have to pay this water replenishment fee for use of MRB groundwater. Staff does not believe that this a sufficient long term mitigation of potential impacts to the groundwater basin because it is highly speculative that water in the volumes necessary to replace the volume consumed by HDPP would be available for purchase and will become increasingly unreliable. The unreliability of SWP is the reason the project owner has filed this PTA.

The project owner's folly of continued reliance on the strained SWP and MRB as primary supplies cannot be indulged. It is imperative that the Energy Commission reduce demand on the Delta where possible and preserve precious groundwater in the MRB for greater beneficial uses. Using the drought resistant recycled water supply is the clear logical alternative to drought proof the project. Staff is fully aware that there may be costs associated with such a conversion, but as discussed above there are several areas where cost savings can be achieved as well. Beyond the real costs of conversion, the environmental benefits must be included in the assessment of cost benefits.

In staff's proposed Condition of Certification **SOIL&WATER-1** staff recommends conversion to 100 percent recycled water use and interim use of MRB for the 3-year conversion period if needed. If MRB groundwater is used during the 3-year conversion period, the owner would pay the water replenishment fees, and this would be sufficient mitigation for this short period. Staff believes that this is a reasonable approach given the expense needed to convert to recycled water use. However for a long term back up supply, after the 3-year conversion, no adjudicated MRB groundwater should be used. Staff recommends use of SWP water banked in the MRB as a back-up supply for project operation after conversion to 100 percent recycled water. Given the current unreliable and increasingly unsustainable SWP supply, the project owner should be

required to implement a water conservation offset plan to reduce any demand on the SWP and contribute to saving the Sacramento-San Joaquin Delta. This would ensure that sufficient supplies are available during normal, dry, and multiple dry-year scenarios.

Typically WSA's are not conducted for recycled water supplies since statewide there is generally more recycled water available than that needed by users. Also, municipalities do not develop infrastructure for delivery of recycled water unless they have a firm user. However as discussed above and claimed by the owner, there is some question of the availability of recycled water. Staff has completed a detailed analysis of recycled water supply availability that is included in "Staff Analysis of the High Desert Power Plant Recycled Water Feasibility Report" (CEC2015d) that satisfies the WSA requirement for this supply.

## **STAFF RECOMMENDATIONS**

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Recycled water is a viable alternative that the project owner should be required to pursue, unless it opts for dry cooling or shutting the project down in accordance with the current Condition of Certification **SOIL&WATER-1**. At the time of the project certification, recycled water was not available to the project. Since conditions have changed in the region and recycled water has become available, it is to the advantage of the project owner to fully utilize this resource as a reliable source to drought proof the project. Given the lack of reliability in local and state freshwater supplies, potential impacts related to ongoing use of these supplies, and in accordance with State and Energy Commission policies regarding use of fresh water for cooling purposes, staff recommends that the project be required to switch to 100 percent recycled water for its operation within three years starting on October 1, 2016. During the transition period, the project would be allowed to use SWP water banked by MWA on its behalf, and/or groundwater from the adjudicated MRB, provided that the amount is limited to 1,600 AFY.

Staff does not agree with the amount of water the project owner is petitioning to use from the MRB - 3,090 AFY. This amount was determined based on extremely conservative assumptions, including the assumption that the VV2 project will be constructed and will use recycled water for its operation. However, staff is recommending allowing a limited amount of water from the MRB during the 3-year conversion period, based on the maximum amount of recycled water that the project owner has reported using in 2014. In table 2 of Exhibit C of the PTA, the project owner reported using a total of 326 AF during the month of August, one of the highest consumption months. Of the 326 AF, 192 AF, or 59 percent, was recycled water. Therefore, as a first step, staff recommends that the project be required to blend a minimum of 60 percent of recycled water, and no more than 40 percent of SWP, banked SWP, or MRB on an annual basis during the 3 year conversion period. Based on the maximum amount of project use of 4,000 AFY, the maximum amount of fresh water should not exceed 1,600 AFY, provided that the percentage of recycled water is not less than 60 percent.

After the transition to 100 percent recycled water is complete, staff recommends that the owner be allowed to use banked SWP water as a backup supply for project operation in case of short term interruptions of recycled water delivery, with a limit of 350 AFY and use the existing bank or create a new bank where 1,750 AF would be stored within a 5 year period. Use of fresh water both during the transition period and after the project has switched to 100 percent recycled water should be in accordance with the new Condition of Certification **SOIL&WATER-1** staff is proposing to replace the existing one.

As previously mentioned, MWA informed staff on December 22, 2015, that the agency would be willing to establish a water bank for the use of HDPP, but it would not support an option where the project would rely on water from the MRB without dedicated replacement. Staff recommends that the owner be allowed to establish a water bank in the MRB through MWA for future use as backup when recycled water is not available in sufficient quantity or quality to meet project needs (CEC 2016). Staff is in favor of the project banking all of the water it acquires from the SWP in the MRB through MWA to be used for blending with the recycled water. Since water from the MRB is generally of better quality than SWP water, less water would be needed to blend with the recycled water to achieve a blend that would be tolerable for the cooling tower and the ZLD system. Staff believes that this solution would eliminate all the confusion associated with having a portfolio of four sources of water, especially that three of those sources, SWP, banked SWP water, and MRB, are more or less linked together. For example, the water injected into the project's groundwater bank comes from SWP. The injected water gets mixed with native MRB water such that it cannot be distinguished from the native MRB water for the purpose of extracting water from the bank.

If the project starts banking all of its fresh water acquired from the SWP in the MRB through MWA, the project owner would no longer be required to maintain the current injection groundwater bank it has been using. The net balance available in that bank may either be transferred to MWA to seed the new bank for the project, or, at the project owner's discretion, continue to be treated as a distinct storage that the project can utilize and keep track of until all available water therein is depleted. A benefit of abandoning the injection groundwater bank is that it would eliminate the need for the project to treat the SWP for injection into that bank. This would result in savings of the treatment costs for the project. It would also free up treatment capacity that could be repurposed to treat more recycled water on the front end, which would result in better quality wastewater on the back end, and thus the back end treatment facilities would be able to treat larger amounts of wastewater.

However, since the water for banking in the MRB will be acquired from the SWP, and in order to eliminate impact to the SWP system, staff proposes that the project owner offset any new water brought from the SWP in order to be consistent with State and Energy Commission policies and decisions for other projects. As stated in the new staff proposed Condition of Certification, **SOIL&WATER-1**, offset can be done either through implementing conservation, or retirement of agricultural land in an area served by the SWP.

Lastly, eliminating the injection groundwater bank will result in additional savings of the cost of water lost to the river through dissipation, in addition to the carry charge for having purchased water sitting in the ground. The amount of water lost to the river through dissipation is proportional to the water level in the bank. For example, when the bank had a total of about 5,000 AF, the amount of dissipation was approximately 50 AFY. At an approximate cost of \$500 per AF, the annual cost to replace the lost water is approximately \$25,000. The annual cost would be higher if the amount of storage was higher. Assuming a linear relationship, the cost would be around \$50,000 per year if the amount of storage was 10,000 AF.

## **Conclusions**

- 1) Staff disagrees with the owner that the variability and limitations on the supply are changed conditions that were not anticipated in the May 2000 Energy Commission decision. The decision and Condition of Certification **SOIL&WATER-1** clearly indicate that if the primary supply (SWP) and the back-up supply from a bank of injected SWP were inadequate for project operation due to variability, the project could not pump MRB groundwater because of basin overdraft impacts. The project owner's vow on several occasions during the permitting process not to use any other water supplies and shut down the project if it loses water supply from SWP indicates that the project owner was well aware of this limitation and accepted it.
- 2) In order to have a backup supply of water in case of interruptions of the primary source of cooling water, the project was required to bank a 3-year supply of SWP water in an injection groundwater bank, which the project owner failed to do despite evidence that surplus water was available and was granted to the project.
- 3) Since recycled water, which was not available to the project at the time of the Final Decision, is now feasibly available in quantities and qualities that can be used by the project, staff concludes that the project owner should take advantage of it as a viable and reliable supply to drought proof the project against potential interruptions in supplies from the SWP.
- 4) The fact that 7 power plants with ZLD systems use recycled water or a combination of recycled water and impaired groundwater for operation is evidence that use of recycled water for cooling purposes is economically feasible.
- 5) Staff reviewed draft financial data provided by the project owner and cannot reach a conclusion about whether the project's ownership structure prevents any capital improvements, specifically for water treatment improvement.
- 6) In light of the fact that recycled water is available to the project in sufficient quantities to meet project needs most of the time, staff concludes that the changes sought by the project owner are not consistent with the State LORS or State or Energy Commission policies.
- 7) Staff proposed use of recycled water for project operation along with a backup of fresh water is consistent with State LORS requiring that worst quality waters be used for cooling purposes whenever such use is environmentally feasible and economically viable.
- 8) Staff also recommends the abandonment of the existing SWP pretreatment and banking operation and replacing it with a bank through MWA, allowing the agency to bank water when it is available, and in locations in the basin that provide benefit to

the basin. This would benefit the project owner because of the expense involved in maintenance and operation of the existing injection bank the project owner has been required to establish in the original 2000 Commission Decision.

- 9) Staff does not agree with the project owner's proposed loading sequence as it does not propose conversion to 100 percent recycled water use. The loading sequence would allow use of freshwater up to the maximum need for the project operation. Such freshwater use would result in potentially significant impacts and is inconsistent with Energy Commission water policy.
- 10) Staff concludes that use of 100 percent recycled water is a feasible alternative supply that would drought proof the project. Staff has proposed alternative language for **SOIL&WATER-1** that would ensure that the project makes full use of the recycled water supply while providing reasonable time to make the conversion and provide necessary backup supplies while the conversion is undertaken. Staff is also sensitive to the concerns about funding available for conversion of the project and identified areas where costs savings would be achieved when the conversion is completed. The condition would also ensure adequate mitigation for potential impacts to SWP and MRB.

## **PROPOSED MODIFICATIONS TO CONDITIONS OF CERTIFICATION**

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The project owner proposes modifications to Condition of Certification **SOIL&WATER-1** that reflect the changes sought by the PTA. Since staff is recommending against approving the proposed changes to the water supplies requested by the PTA, staff also recommends rejecting those modifications. Instead, staff proposes replacing Condition of Certification **SOIL&WATER-1** with the one proposed below which reflects staff's recommendations. Since conversion to 100 percent recycled water use would require time and planning, the condition allows the project to use banked SWP and/or adjudicated MRB water for make-up and blending during the 3-year transition period. The proposed condition would allow the project to use a maximum of 1,600 AFY of fresh water from the MRB for three years while the project transitions to 100 percent recycled water. This water can be either SWP water banked by MWA for project use, or adjudicated groundwater basin water. After the project converts to 100 percent recycled water use, the condition would allow the project to use up to 350 AFY of previously stored groundwater from MRB as backup in case of short term interruptions in recycled water supply.

**SOIL&WATER-1 The primary water supply for the project shall be appropriately treated recycled wastewater from the City of Victorville. On October 1, 2016 the project owner shall convert to use of a minimum of 60 percent recycled water and a maximum of 40 percent of Mojave River Basin (MRB) groundwater. Use of MRB during this 3-year period is limited to 1,600 acre feet per year (AFY).**

**Where project changes to convert to 100 percent recycled water use have the potential to affect the environment, the project owner shall timely submit**

the necessary petitions for project modification for expedited review and approval by the CPM.

Within 3 years after initiating use of a minimum of 60 percent recycled water, the project will begin to transition to 100 percent recycled water use. The conversion shall be completed by September 30, 2019. After the project converts to 100 percent recycled water supply, the project owner shall maintain the existing injection bank managed by City of Victorville or create a bank of SWP supply in cooperation with the City of Victorville and Mojave Water Agency through use of MWA spreading grounds. The project owner shall ensure that 1,750 AF is banked over a 5-year period after conversion to 100 percent recycled water use. The project shall limit use of banked supply to 350 AFY. The banked supply shall only be used for backup during recycled water supply interruptions that are beyond the control of the project owner. The project owner may discontinue banking within 5 years of cessation of project operation.

No groundwater from MRB other than banked SWP supply shall be used for project operation or backup supply after conversion to 100 percent recycled water use.

Whenever groundwater is needed from the MRB while the project is transitioning to 100 percent recycled water, the project owner may use groundwater stored in the existing project injection bank, water banked in the MRB by MWA on behalf of the project, and/or MRB groundwater provided by the City of Victorville through their adjudicated water rights. After transitioning to 100 percent recycled water, the project may only use SWP water banked in the MRB for its use. Any SWP water or City of Victorville adjudicated groundwater supply acquired for direct project use shall be offset on a one for one basis by implementing a Water Conservation Offset Plan (WCOP). SWP water acquired for banking using either the existing injection bank or banked by MWA on behalf of the project shall also be offset on a one for one basis.

Offset of water use from the existing project bank is not required unless use of the injection bank continues after the 3 year conversion and additional SWP water is injected for project use after adoption of this amendment. Whether the project owner chooses to continue or discontinue use of the existing injection bank for operation, the balance available to the project shall be maintained in accordance with SOIL&WATER-5.

The WCOP shall be implemented in the SWP service area and reduce demand on the SWP. The offset measures shall consider activities such as payment for irrigation improvements in the SWP service area, urban water conservation measures in the SWP service area, expansion or conversion of other projects to recycled water use in the SWP service area, or other proposed activities acceptable to the CPM.



**The WCOP shall be provided to the CPM for review and approval and shall include the following at a minimum:**

- A. Identification of the amount of water offsets that the project owner believes are required given their needs and schedule for conversion to 100 percent recycled water use.**
- B. Demonstration of the Project owner's ability to conduct the activity;**
- C. Whether any governmental approval of the identified offset will be needed, and if so, whether additional approval will require compliance with CEQA or NEPA;**
- D. Demonstration of how much water is provided by each of the offset measures;**
- E. An estimated schedule for completion of the offset activities;**
- F. Performance measures that would be used to evaluate the reduction in demand on the SWP; and**
- G. A Monitoring and Reporting Plan outlining the steps necessary and proposed frequency of reporting to show the activities are achieving the intended reductions in demand.**

**The project owner shall report all use of water from all sources to the Energy Commission CPM. The reports shall also include information showing the remaining groundwater bank account balances.**

**Verification: The project owner shall provide semi-annual reports to the CPM discussing progress the project owner is making towards conversion to 100 percent recycled water use and a schedule showing when the conversion will be completed. The reports shall include tables, charts, or graphs as necessary and a narrative discussion of any issues with the conversion to recycled water use, variations in recycled water quantity and quality, and any testing completed for recycled water supply or use at the project. The first report is due on April 1, 2017.**

**The project owner shall report all use of water from all sources to the CPM on a monthly basis in acre-feet during the 3 year conversion to 100 percent recycled water use. Once the conversion is complete the reports shall be submitted on an annual basis in the Annual Compliance Report. The reports shall include tables, charts, or graphs, or a combination thereof, showing how much of each supply was used. The reports shall also show the amount of water banked for project operation, which bank was used, the balance remaining for project operation, and any water conservation offset that was implemented in accordance with the WCOP described above.**

**The project Owner shall submit a WCOP to the CPM for review and approval thirty (30) days before the acquisition of SWP water for project operation.**

**The Project owner shall implement the activities reviewed and approved in the WCOP in accordance with the agreed upon schedule in the WCOP. Any reports on the status of conservation offsets may be combined with the water use reports described above. If agreement with the CPM on identification or implementation of offset activities cannot be achieved the Project owner shall immediately halt acquisition or banking for project use until the agreed upon activities can be identified and implemented.**

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Current Condition of Certification

**SOIL&WATER-1** Water used for project operation (except for domestic purposes) shall be State Water Project (SWP) water obtained by the project owner consistent with the provisions of the Mojave Water Agency's (MWA) Ordinance 9 and/or appropriately treated recycled waste water, and/or an alternative water supply obtained consistent with the "Judgment After Trial" dated January, 1996, in City of Barstow, et al. v. City of Adelanto, et al. (Riverside County Superior Court Case No. 208568) as administered by MWA (the "Judgment") (collectively, "Adjudicated Water Rights").

- ~~a. Whenever recycled waste water of quality sufficient for project operations is available to be purchased from the City of Victorville, the project owner shall use direct delivery of maximum quantities of such water for project operations. Whenever the quantity or quality of recycled waste water is not sufficient to support project operations, the project may supplement recycled water supplies with SWP water, banked SWP water from the four HDPP wells as long as the amount of water used does not exceed the amount of water determined to be available to the project pursuant to SOIL&WATER-5, and/or MRB Adjudicated Water Rights. The project owner shall consume no more than 2000 AF in water year 2014/2015 (October 1, 2014 – September 30, 2015) and no more than 2000 AF in water year 2015/2016 (October 1, 2015 – September 30, 2016) of MRB Adjudicated Water Rights and the acquisition, use, and transfer of MRB Adjudicated Water Rights shall be in compliance with the Judgment and Rules and Regulations of MWA Watermaster. At the project owner's discretion, dry cooling may be used instead, if an amendment to the Commission's decision allowing dry cooling is approved.~~
- ~~b. The project owner shall report all use of water from all sources to the Energy Commission CPM on a monthly basis in acre-feet.~~
- ~~c. The project owner shall submit a Petition to Amend (PTA) no later than November 1, 2015 that will implement reliable primary and backup HDPP water supplies that are consistent with state water policies or an alternate cooling system like dry cooling.~~

d. ~~(Item deleted)~~

e. ~~The project's water supply facilities shall be appropriately sized and utilized to meet project needs. The project shall make maximum use of recycled waste water for power plant cooling given current equipment capabilities and permit conditions.~~

f. ~~The project owner shall continue with the feasibility study evaluating the use of 100 percent recycled water for evaporative cooling purposes and other industrial uses. The feasibility study shall be completed by the project owner and submitted to the CPM.~~

**Verification:** ~~The project owner shall provide final design drawings of the project's water supply facilities to the CPM, for review and approval, thirty (30) days before commencing project construction. The project owner shall submit to the CPM documentation showing the agreements entered into between the project owner and, MWA Watermaster, and water right owners in MRB regarding the acquisition, use, and transfer of MRB Adjudicated Water Rights. The project owner shall report all use of water from MRB to Energy Commission CPM on a monthly basis.~~

~~The project owner shall provide a biannual report on the progress being made on the project design for use of 100 percent recycled water for power plant cooling. The report shall include information related to project modifications that may be needed for using up to 100 percent recycled water. The first report shall be due six months after adoption of this condition of certification, and the final feasibility report shall be submitted to the CPM no later than November 1, 2014. Verifying compliance with other elements of Condition **SOIL & WATER-1** shall be accomplished in accordance with the provisions of the Verifications for Conditions 2,3, 6, 20, and 21 as appropriate.~~

~~The project owner shall submit a PTA no later than November 1, 2015 that will implement reliable primary and backup HDPP water supplies that are consistent with state water policies or an alternate cooling system like dry cooling.~~

~~The final feasibility study should contain, but not be limited to, the following information:~~

~~I—~~ **Water Supply**

~~A. Potential sources of recycled water, its current and projected use, and alternative pipeline routes~~

~~B. Adequacy of recycled water supplies to meet plant operation demand (provide future projections of supply and demand considering annual~~

- volumes, monthly patterns of plant water use vs. availability of water supply, and peak day supply and demand)
- C. ~~Quality of existing and recycled water supplies~~
- D. ~~Water treatment requirements for existing and recycled water supplies~~
- E. ~~Cooling cycles of concentration for existing and potential recycled water supplies~~

## ~~II— Cooling & Process Needs~~

- A. ~~Consumptive water uses e.g.: cooling tower make-up, evaporative cooling of CTG inlet air, CTG compressor intercooling, and STG condensation; CTG NO<sub>x</sub> control; CTG power augmentation; boiler water makeup~~
- B. ~~Space requirements for additional treatment of recycled water supplies vs. space available on the plant site~~
- C. ~~Water balance diagrams for recycled water use and wastewater discharge for average and peak conditions to include distinctions in using existing vs. recycled water~~

## ~~III— Wastewater Treatment Disposal~~

- A. ~~Method (existing discharge via sewer system to WWTP, dedicated brine return line, deep well injection, or zero liquid discharge (ZLD) recovery)~~
- B. ~~Available capacity & operating limitations~~

## ~~IV— Economic Costs of Existing Source and Recycled Sources (where applicable)~~

- A. ~~Capital costs~~
  - 1. ~~water supply pipeline~~
  - 2. ~~water supply pumping station(s)~~
  - 3. ~~well(s)~~
  - 4. ~~water treatment system~~
  - 5. ~~wastewater pipeline & facility capacity charge~~
  - 6. ~~permitting (PM10, Legionella, discharge quality and quantities)~~
  - 7. ~~Right of Way and Easement acquisitions~~
  - 8. ~~engineering, procurement, construction inspection and testing~~
  - 9. ~~biologic surveys/environmental assessment reports~~
- B. ~~Annual (operating and maintenance) Costs~~
  - 1. ~~existing and recycled water purchase cost~~
  - 2. ~~chemicals (cooling tower & water treatment)~~
  - 3. ~~labor~~
  - 4. ~~energy (water supply pumping, water treatment)~~
  - 5. ~~wastewater discharge fee~~
  - 6. ~~solids disposal (class of waste, transportation & landfill fees)~~

- C. ~~Project Life – Identify project life~~
- D. ~~Total Project Cost (base case)~~
- E. ~~Installed cost per watt~~
- F. ~~Total Annualized Cost – expressed as the uniform end-of-year payment (A/P) of Capital Costs + Annual Costs~~
- G. ~~Cost of Capital~~
- H. ~~Debt to equity ratio~~
- I. ~~Average debt service coverage ratio~~
- J. ~~Identify internal rate of return~~
- K. ~~Monthly and annual energy production since becoming operational~~

**~~V – Expected Effects on Electric Customers~~**

- A. ~~Description of existing electricity rate structure and current rates to customers using existing water source~~
- B. ~~Description of expected electricity rates to customers using recycled water over remaining life of the plant~~

**~~VI – Environmental Considerations for the use of Recycled Water~~**

- A. ~~Describe the potential effects of recycled water use on the generation of hazardous waste and on the quality of its wastewater discharge~~
- B. ~~Describe the potential impacts to public health through the use and discharge of recycled water~~
- C. ~~Describe the potential effects of recycled water use and discharge on the degradation of water quality and its potential to be injurious to plant life, fish, and wildlife~~
- D. ~~Describe potential effects on existing water rights or entitlements~~

**~~VII – Discussion of applicable California Water Code provisions~~**

## References

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- CEC 2000 -- California Energy Commission. FINAL Commission Decision on the High Desert Power Project. May 2000.
- CEC 2006 -- California Energy Commission. Order Approving a Petition to Extend The Period To Inject Surface Water Into The Groundwater for a Backup Water Supply. TN # 37467. July 2006.
- CEC 2009 -- California Energy Commission. Order Approving a Petition to Modify Soil and Water Conditions Related to Use of Recycled Water for Project Cooling. TN # 54277. November 2009.
- CEC 2010 -- California Energy Commission. Genesis Solar Energy Project, Decision and Scoping Order. Filed with the dockets on February 2, 2010.
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- CEC 2015b -- California Energy Commission. Report of Conversation between Energy Commission staff and representatives from VVWRA treatment plant and Victorville Water District regarding issues of recycled water delivery to the HDPP. TN# 206296. October 2015.
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- CEC 2016 -- California Energy Commission. Report of Conversation Between Energy Commission Staff and Representatives from Mojave Water Agency and the City of Victorville Regarding Availability of Groundwater from the Mojave River Basin for Use by the High Desert Power Project.