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DAYZEN LLC

June 28, 2016

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California Energy Commission
1516 Ninth Street, MS-2000
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Subject: **PACIFIC GAS AND ELECTRIC COMPANY'S PETITION FOR AMENDMENT**
COLUSA GENERATING STATION
DOCKET NO. (06-AFC-9C)

Dear Mr. Veerkamp,

On behalf of Pacific Gas and Electric Company (PG&E) DayZen LLC hereby submits the Petition for Amendment (Petition) for Colusa Generating Station (06-AFC-9C) (CGS) to request addition of a Warehouse, addition of electrical equipment and three electrical cabinets to allow gradual increase of load to the electric motors for each fan on the Air Cooled Condenser (ACC), and installation of rotating intake screens to control algae blooms at the water intakes for the Tehama Colusa Canal (TCC).

I certify under penalty of perjury that the foregoing is true, correct, and complete to the best of my knowledge. I also certify that I am authorized by PG&E to submit this Petition for Amendment.

Sincerely,

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Counsel to PG&E

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PETITION TO AMEND

COLUSA GENERATING STATION (06-AFC-9C)

SUBMITTED TO: CALIFORNIA ENERGY COMMISSION

SUBMITTED BY: PACIFIC GAS & ELECTRIC COMPANY (PG&E)

JUNE 2016

DAYZEN LLC

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Section 1 INTRODUCTION

1.1 INTRODUCTION TO PETITION

Pursuant to Section 1769 of the California Energy Commission (Commission) regulations[1], Pacific Gas & Electric Company (PG&E) files this Petition For Amendment (Petition) with the California Energy Commission (Commission) to modify the Colusa Generating Station (CGS). This Petition requests addition of a Warehouse, addition of electrical equipment and three electrical cabinets to allow gradual increase of load (rather than instantaneous) to the electric motors for each fan on the Air Cooled Condenser (ACC), and installation of rotating intake screens to control algae blooms at the water intakes for the Tehama Colusa Canal (TCC). This section describes the procedural background of the CGS and cites the authority for the Commission to process this Petition.

Section 2 of the Petition describes the modifications proposed the CGS including an explanation of the need for each modification.

Sections 3, 4, 5 and 6 contain analysis of the proposed modifications comparing the potential environmental impacts from the modifications to the potential environmental impacts of the CGS as approved in the Commission Final Decision[2]. As discussed in these Sections, PG&E does not anticipate any significant environmental impacts from the proposed modifications and therefore is not proposing any modifications to the existing Conditions of Certification.

Section 7 contains an analysis demonstrating that the modifications do not increase any potential effects on nearby property owners or the public.

1.2 FINAL DECISION BACKGROUND

E&L Westcoast, LLC filed an Application For Certification (AFC) with the Commission on November 6, 2006 to construct and operate the CGS, a nominal 660 megawatt (MW) combined cycle power plant. The CGS was proposed by E&L Westcoast, LLC in response to PG&E's 2004 Request For Offers and on January 11, 2008, PG&E became the Applicant and Project Owner. The Commission issued its Final Decision approving the CGS on April 23, 2008 (Order No. 08-0423-23, the "Final Decision", 06-AFC-9).

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[1] Title 20 CCR Section 1769

[2] References to the Commission Final Decision include all amendments approved after issuance and prior to the date of this Petition For Amendment.

1.3 PRIOR PETITIONS FOR AMENDMENT

On August 14, 2008, PG&E filed a Petition For Amendment to revise the general equipment arrangement, eliminate the diesel emergency generator, replace the diesel fire pump with an electric fire pump, eliminate the auxiliary boiler, relocate the natural gas metering station, and incorporate a natural gas water bath heater system and a wet surface air cooler. On July 15, 2009 the Commission approved the Petition For Amendment.[3]

On January 21, 2009, PG&E submitted a Petition For Amendment proposing slight modifications to the size and layout of the switchyard and the electric transmission interconnection route. On April 16, 2009 the Commission approved the Petition For Amendment.[4]

On November 13, 2013, PG&E submitted a Petition For Amendment proposing to modify its ultra-filtration system. The Commission approved the Petition For Amendment on December 13, 2013.[5]

On February 6, 2014 PG&E submitted a Petition For Amendment to store a spare generator step-up transformer at the CGS site. The Commission approved the Petition For Amendment on March 14, 2014.[6]

On March 14, 2014, PG&E submitted an Emergency Petition for Amendment to allow temporary withdrawal and trucking of water from the Glenn Colusa Canal in the same manner that was authorized during construction. On April 22, 2014, the Commission approved the Petition For Amendment.

On May 28, 2014, PG&E filed a Petition For Amendment to replace the temporary withdrawal and trucking of water from the Glenn Colusa Canal with a permanent water supply line. The Commission approved the Petition For Amendment on August 22, 2014.[7]

On February 6, 2015, PG&E filed a Petition For Amendment to add a fin fan cooling apparatus to dry cool the Heat Recovery Steam Generator (HRSG) Blowdown effluent water and a separate Petition For Amendment to install additional grating on the steam

[3] Order No. 09-715-2, dated July 15, 2009, TN 522443

[4] Letter from Chris Davis, CEC Compliance Project Manager, dated April 16, 2009 to John Maring, PG&E, TN 51119

[5] Notice of Determination, dated December 13, 2013, TN 201431, no objections filed within 14 days

[6] Notice of Determination, dated March 14, 2014, TN 201878, no objections filed with 14 days

[7] Notice of Determination, dated August 22, 2014, TN 202974, no objections filed with 14 days

turbine deck to expand the useful area and make it safer for turbine and generator work. On March 25, 2015, the Commission approved both Petitions.[8]

On June 25, 2015, PG&E filed a Petition For Amendment to conform the Air Quality Conditions of Certification to the Revised Title V Operating Permit. On July 27, 2015, PG&E revised the Petition For Amendment as requested by CEC Staff. The Commission approved the Petition For Amendment as revised on December 9, 2015.[9]

1.4 SUMMARY OF ENVIRONMENTAL IMPACTS

As described in Sections 3, 4, 5 and 6 of this Petition, the project modifications proposed herein, with implementation of the Conditions of Certification contained in the Final Decision and subsequent amendments will not result in significant environmental impacts and will comply with all applicable LORS.

1.5 CONSISTENCY OF PROJECT MODIFICATIONS WITH LICENSE

As demonstrated in Sections 3 through 6 the proposed modifications proposed in this Petition do not undermine any of the findings and conclusions contained in the Final Decision.

[8] Notice of Determination, dated March 25, 2015, TN 203959 and letter dated April 22, 2015 from CEC Compliance Project Manager Eric Veerkamp to Charles Price, PG&E, TN 204312

[9] Order No. 15-1209-3, dated December 9, 2015, TN 207036

Section 2 DESCRIPTION OF PROJECT AMENDMENT

2.1 OVERVIEW OF PROPOSED MODIFICATIONS

PG&E is proposing in this Petition For Amendment to install a new warehouse, to convert the electric motors for each fan on the ACC to allow soft starts, and to install rotating intake screens to control algae blooms at the water intakes for the Tehama Colusa Canal (TCC). Detailed descriptions of each modification are provided below.

2.1.1 NEW WAREHOUSE

The proposed new warehouse will be constructed 30 feet to the west of the existing warehouse which is currently located in the southeast corner of the CGS site. It will be approximately 65 feet by 110 feet and approximately 24 feet tall. The warehouse will have a roof interconnection to the existing warehouse to allow for covered storage. It will be constructed on spread footings with a concrete slab on grade. The building will utilize standard metal I-beam construction with metal-clad walls and will be constructed with materials and methods similar to the existing adjacent warehouse.

Figure 2-1, General Arrangement and Site Plan shows the proposed location of the new warehouse. This location consists of land that was previously graded during the construction of the CGS. Figures 2-2 and 2-3 depict the relative size of the new warehouse in relation to the surrounding structures.

2.1.2 ACC SOFT START

The existing ACC has 42 fans, each driven by a 200 HP/480 volt motor. Each fan has an associated gearbox. Starting and stopping each fan repeatedly to accommodate plant cycling induces stresses on the gearbox. This induced stress has contributed to higher than desired failure rates of the gearboxes and motors. To reduce this stress on each fan motor/gearbox, soft start electrical equipment (Soft Starts) will be installed within three new electrical equipment cabinets. The Soft Starts will control the flow of electricity to allow each fan motor to gradually increase electric load to the motor to greatly reduce start-up inertia stresses. The three new electrical cabinets will be approximately 3 feet by 8 feet and 7 feet tall and will be located under the ACC. The electrical cabinets are the only additional equipment to be installed and will be installed on new concrete pads.

2.1.3 ROTATING INTAKE SCREENS

PG&E is proposing to install rotating intake screens and associated equipment to assist its approved use of water from the Tehama Colusa Canal (TCC). The TCC is owned by the U.S. Bureau of Reclamation and operated by the Tehama Colusa Canal Authority (TCCA). As described in the Final Decision and subsequent amendments, although the CGS is a "dry-cooled" facility, the Commission approved the pumping of water from the TCC for its primary water supply and water pumped from the Glenn Colusa Irrigation District (GCID) canal as a backup water supply. The proposed modifications are for the intake facilities at the TCC only and not for the facilities at the GCID.

Large algae blooms that occur near the pump intakes at the TCC result in the need for operators to manually clean the pump intake screens on a routine, sometimes daily basis. The modification proposed for use at the CGS TCC pump is an apparatus which will remove algae from the intake screens on an automated basis. The apparatus will use rotating, periodic blasts of compressed air to remove the attached algae.

The system would require a small modification to the intake pumps and the addition of an air compressor. The compressor would reside across the canal access road from the canal, would have secondary containment to prevent any oil leakage into the canal, and would be checked during and after any rain event prior to releasing the stormwater. There will also be a downward facing light pole in the area for maintenance and operational checks. This automated system will remove the potential for personnel injury from the manual, repetitive, ergonomically-poor sweeping. The new light sources will also improve personnel safety around the water. The TCCA has approved screen modification to the pumps.

To accommodate the rotating intake screen modifications the following new equipment will need to installed:

- Two rotating screens
- Covers over the pump inlet screens
- A new light pole at the location of the new compressor pad
- New Compressor Pad, Compressor, Compressor Switch and Compressor Junction Box
- A new underground compressed air pipeline
- New underground electric cabling within existing underground conduit

Figure 2-4 shows the new components including the new compressor (highlighted in yellow) to be installed to support the rotating intake screens. Figure 2-5 shows the locations, relative to the existing platform and intake structures, where the new intake

screens will be installed. Additionally, a vendor brochure describing the rotating intake screens is provided in Appendix A.

2.2 CONSTRUCTION ACTIVITIES

2.2.1 New Warehouse

The contractor and sub-contractor will use the area along the south fence for laydown. The areas proposed for laydown and the new warehouse footprint are currently surfaced with gravel over previously disturbed soil. Construction equipment is not expected to include more than two trucks and two lifts on site at any one time. Construction workforce would not exceed more than 6 workers on site on a regular basis. The construction activities would be same for the new warehouse as was used to construct the existing warehouse.

2.2.2 ACC Soft Start

Existing building space will be used to store necessary equipment indoors during construction. There is adequate laydown area directly under the ACC for construction. There will be an average of 4 people on site for the duration of the project. Construction will be in accordance with the existing CEC Conditions of Certification.

2.2.3 Rotating Intake Screens

Crews will access the TCC pumps from the west canal access road from the west side of the CGS to the TCC. None of the work will take place within the TCC. The pumps will be removed and the screens installed and then placed back into the TCC.

Construction of the compressor pad, installation of the compressor and light fixtures, and hose and electrical will all be performed from the canal access road. See Figure 2-6 for the locations of the pull boxes.

2.3 PROJECT MODIFICATIONS SCHEDULE

2.3.1 New Warehouse

It is expected that the construction of the new warehouse will take approximately 60 days including mobilization and demobilization.

2.3.2 ACC Soft Start

Installation of the soft start equipment will require an outage of the ACC fans. Therefore, the work cannot be performed during the summer months, when all fans are required for operation of the plant. Prior to the summer heat, it is expected that the

three foundation pads will be poured and cured and one electrical cabinet will be installed. It will take approximately 30 days to complete the foundations and install the single cabinet. The other two cabinets will be installed after temperatures have cooled.

2.3.3 Rotating Intake Screens

This project is estimated to be completed within 30 days. PG&E plans to perform the work when the TCC is out of service for annual maintenance. The TCC maintenance window is typically 30 to 60 days and is scheduled by the TCCA during the months of low usage. PG&E will coordinate with the TCCA to ensure this project does not interfere with annual TCC maintenance activities.

2.4 PURPOSE AND NEED FOR AMENDMENT

During the time of licensing, PG&E did not envision needing additional warehouse storage capacity, the need for soft-start capability for the ACC, nor the need for automatic rotating intake screens. Therefore, these components were not requested by PG&E at the time of the original licensing proceedings.

2.4.1 New Warehouse

PG&E's purpose for requesting the additional warehouse is to accommodate the immediate necessity for indoor storage of major component parts for the upcoming Hot-gas Path outage (a requirement by the equipment manufacturer). The long-term necessity is to allow storage for a more complete set of spare parts to increase reliability of the power plant.

2.4.2 ACC Soft Start

The need for the conversion of the electric motors on the ACC fans is to allow gradual increase of the electric load to each motor to greatly reduce start-up inertia stresses and reduce higher than desired failure rates experienced as a result of plant cycling.

2.4.3 Rotating Intake Screens

The purpose of installing the rotating intake screens is to remove the potential for personnel injury from the repetitive, ergonomically poor manually sweeping. It will also improve personnel safety around the water by increasing light after dark.

Section 3 ENGINEERING ASSESSMENT

This section contains an evaluation of the modifications proposed in this Petition For Amendment to determine if they would result in modification the findings, conclusions or conditions of certification for each technical discipline included within the Engineering Assessment section of the Final Decision.

3.1 FACILITY DESIGN

3.1.1 Proposed Modifications

3.1.1.1 New Warehouse

The construction of the proposed new warehouse will not undermine any finding or conclusion contained in the Final Decision. The proposed new warehouse will be constructed in a similar manner using the same construction methods approved for the existing warehouse which is immediately adjacent to the proposed new warehouse. Existing conditions of certification will ensure the proposed new warehouse will comply with all applicable laws, ordinances, regulations and standards (LORS) and therefore no modifications to the analysis, findings, conclusions or conditions to the certification contained in the Facility Design section of the Final Decision are necessary.

3.1.1.2 ACC Soft Start

As described in Section 2 of this Petition, to enable the individual motors for each ACC fan to allow better plant cycling, three electrical cabinets and soft start electrical gear will need to installed beneath the ACC. The Final Decision requires that all electrical components be designed, constructed and operated in accordance with all applicable LORS. Existing conditions of certification will ensure the ACC Soft Start will comply with all applicable laws, ordinances, regulations and standards (LORS) and therefore no modifications to the analysis, findings, conclusions or conditions to the certification contained in the Facility Design section of the Final Decision are necessary.

3.1.1.3 Rotating Intake Screens

Existing conditions of certification will ensure the Rotating Intake Screens will comply with all applicable laws, ordinances, regulations and standards (LORS) and therefore no modifications to the analysis, findings, conclusions or conditions to the certification contained in the Facility Design section of the Final Decision are necessary.

3.1.2 Changes in LORS Conformance and Other Permits

There are no changes in Facility Design LORS or required permits necessary to construct and operate the modifications proposed in this Petition.

3.1.3 Conditions of Certification

No modifications to the any of the existing Facility Design conditions of certification are necessary.

3.2 POWER PLANT EFFICIENCY AND RELIABILITY

The proposed modifications do not result in any negative affect on power plant efficiency or reliability. However, the addition of the ACC Soft Start capability increases reliability as breakdown of fan motors should decrease due to the reduced stress on the gearboxes associated with plant cycling. Similarly, the rotating intake screens may slightly increase reliability since the intake pumps will not be dependent on manual cleaning.

3.3 TRANSMISSION SYSTEM ENGINEERING

None of the proposed modifications require changes to the switchyard or the transmission line. Therefore the proposed modifications will have no effect on the findings, conclusions or conditions of certification contained in the Transmission System Engineering section of the Final Decision.

3.4 TRANSMISSION LINE SAFETY AND NUISANCE

None of the proposed modifications require changes to the switchyard or the transmission line. Therefore the proposed modifications will have no effect on findings, conclusions or conditions of certification contained in the Transmission Line Safety and Nuisance section of the Final Decision.

Section 4 PUBLIC HEALTH AND SAFETY

This section contains an evaluation of the modifications proposed in this Petition to determine if they would result in modification to the findings, conclusions or conditions of certification for each technical discipline included within the Public Health and Safety section of the Final Decision.

4.1 AIR QUALITY, GREENHOUSE GASES AND PUBLIC HEALTH

4.1.1 Proposed Modifications

4.1.1.1 New Warehouse

The proposed new warehouse will result in emissions during construction. The emissions will be created through limited grading and excavation within the proposed new warehouse footprint and use of approximately two trucks and two lifts on site at any one time. These construction emissions will be considerably less than the construction emissions of the entire plant. The plant construction emissions were evaluated in the Air Quality section of the Final Decision and determined to result in less than significant environmental impacts with the implementation of the conditions of certification. Construction of the proposed new warehouse will comply with the conditions of certification and therefore will not undermine any of the findings and conclusions of the Air Quality, Public Health and Greenhouse Gases sections of the Final Decision.

4.1.1.2 ACC Soft Start

Construction of the ACC Soft Start modification will involve very limited construction work and therefore any associated emissions are negligible. Operation of the ACC Soft Start modification will not alter the emissions of the plant. Therefore, the ACC Soft Start modification will not undermine any finding or conclusion of the Air Quality, Public Health and Greenhouse Gases sections of the Final Decision.

4.1.1.3 Rotating Intake Screens

The Rotating Intake Screens are powered by electricity and will not produce any emissions during operation. Construction activities do involve limited trenching to install a new compressed air line from the compressor skid to the intake locations. However, these emissions are negligible and certainly much less than the emissions from construction of the plant. The construction work to install the rotating intake screens and necessary support equipment will comply with the existing conditions of certification and therefore will not undermine any of the findings and conclusions of the Air Quality, Public Health and Greenhouse Gases sections of the Final Decision.

4.1.2 Changes in LORS Conformance and Other Permits

There are no new Air Quality, Public Heath, or Greenhouse Gases LORS or required permits for the modifications proposed in this Petition.

4.1.3 Conditions of Certification

No modifications to the any of the existing Air Quality and Public Health conditions of certification are necessary.

4.2 HAZARDOUS MATERIALS MANAGEMENT

The modifications proposed in this Petition will not affect the findings and conclusions contained in the Hazardous Materials Management section of the Final Decision as none of the modifications will involve the use of hazardous materials.

4.3 WORKER SAFETY/FIRE PROTECTION

The proposed modifications will not expose workers to any additional risks not evaluated in the Worker Safety/Fire Protection section of the Final Decision. PG&E will require the contractors to comply with its various safety plans during construction. Ultimately the installation of the rotating intake screens will reduce potential injuries to workers by reducing the repetitive, ergonomically poor manual and cleaning currently required. In addition, installation of the lighting will improve worker safety.

None of the modifications proposed in this Petition will affect the findings and conclusions of the Final Decision relating to fire protection.

Since the work for all of the proposed modifications will be performed in accordance with the Conditions of Certification, the proposed modifications do not undermine any finding or conclusion of the Worker Safety/Fire Protection section of the Final Decision.

Section 5 ENVIRONMENTAL ANALYSIS

This section contains an evaluation of the modifications proposed in this Petition to determine if they would result in modification to any of the findings, conclusions or conditions of certification for each technical discipline included within the Environmental Assessment section of the Final Decision.

5.1 BIOLOGICAL RESOURCES

5.1.1 Proposed Modifications

5.1.1.1 New Warehouse

The proposed new warehouse will result in grading and excavation. However, the new warehouse construction area and the area proposed for laydown are currently surfaced with gravel over previously disturbed soil. Construction of the proposed new warehouse will comply with the conditions of certification and therefore will not undermine any of the findings and conclusions of the Biological Resources sections of the Final Decision.

5.1.1.2 ACC Soft Start

Construction of the ACC Soft Start modification will also take place within previously disturbed areas under the ACC. Construction will comply with the conditions of certification and therefore will not undermine any of the findings and conclusions of the Biological Resources section of the Final Decision.

5.1.1.3 Rotating Intake Screens

Construction of the Rotating Intake Screens will involve limited ground disturbance related to the trenching of the compressed air pipeline and installation of the compressor skid and associated electrical equipment. There will be no construction or disturbance in the TCC or its banks. The pumps will be lifted from the TCC and the rotating intake screens installed and lowered back into the TCC. The construction work to install the rotating intake screens and necessary support equipment will comply with the existing conditions of certification and therefore will not undermine any of the findings and conclusions of the Biological section of the Final Decision.

5.1.2 Changes in LORS Conformance and Other Permits

There are no new Biological Resource LORS or required permits for the modifications proposed in this Petition.

5.1.3 Conditions of Certification

No modifications to the any of the existing Biological Resource conditions of certification are necessary.

5.2 SOIL AND WATER RESOURCES

The only potential impact that may affect soil or water resources is related to the addition of an air compressor which would reside across the canal access road from the TCC. The compressor would have secondary containment and would be checked during and after any rain event prior to releasing the stormwater. With this design feature and the existing conditions of certification the modifications proposed in the Petition will not undermine any of the findings or conclusions contained in the Soil and Water Section of the Final Decision. No modification to any Soil and Water Resource condition of certification is necessary.

5.3 CULTURAL RESOURCES

Since all of the construction will take place within previously graded areas, the modifications proposed in this Petition will not have any effect on the findings, conclusions or will not require any modification to the conditions of certification contained in the Cultural Resources Section of the Final Decision.

5.4 GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

Since all of the construction will take place within previously graded areas, the modifications proposed in this Petition will not have any effect on the findings, conclusions or will not require any modification to the conditions of certification contained in the Geological and Paleontological Resources Section of the Final Decision.

5.5 WASTE MANAGEMENT

The construction of the modifications proposed in this Petition will create minor amounts of construction related waste materials. However, compared to the amount of construction waste created during construction of the plant, the amounts are negligible. No new waste streams will be created during operations of the New Warehouse, the ACC Soft Start, or the Rotating Intake Streams. Therefore, the proposed modifications will not undermine any findings or conclusions of the Waste Management section of the Final Decision. No modifications to the Waste Management conditions of certification are required.

Section 6 LOCAL IMPACT ANALYSIS

This section contains an evaluation of the modifications proposed in this Petition to determine if they would result in modification to any findings, conclusions or conditions of certification for each technical discipline included within the Local Impact Assessment section of the Final Decision.

6.1 LAND USE

The modifications proposed in this Petition will not affect the findings and conclusions contained in the Land Use section of the Final Decision as none of the modifications will involve the use of new land areas.

6.2 NOISE AND VIBRATION

The modifications proposed in this Petition will not affect the findings and conclusions, nor require any modifications to the existing conditions of certification, contained in the Noise and Vibration section of the Final Decision as none of the modifications will create new sources of noise or vibration.

6.3 SOCIECONOMICS

The modifications proposed in this Petition will not affect the findings and conclusions, nor require any modifications to the existing conditions of certification, contained in the Socioeconomic Resources section of the Final Decision as none of the modifications will burden existing public services.

6.4 TRAFFIC AND TRANSPORTATION

The modifications proposed in this Petition will not affect the findings and conclusions, nor require any modifications to the existing conditions of certification, contained in the Traffic and Transportation section of the Final Decision as none of the modifications will significantly increase traffic on local roads.

6.5 VISUAL RESOURCES

The modifications proposed in this Petition will not affect the findings and conclusions, nor require any modifications to the existing conditions of certification, contained in the Visual Resources section of the Final Decision as none of the modifications will create significant visual impacts. As shown in Figures 2-2 and 2-3, while the new warehouse will be able to be seen, the new structure will be similar in design and color as the

existing adjacent warehouse. The new warehouse although slightly larger will not dominate the view as the view is currently dominated by the larger plant structures.

Section 7 POTENTIAL EFFECTS ON PROPERTY OWNERS

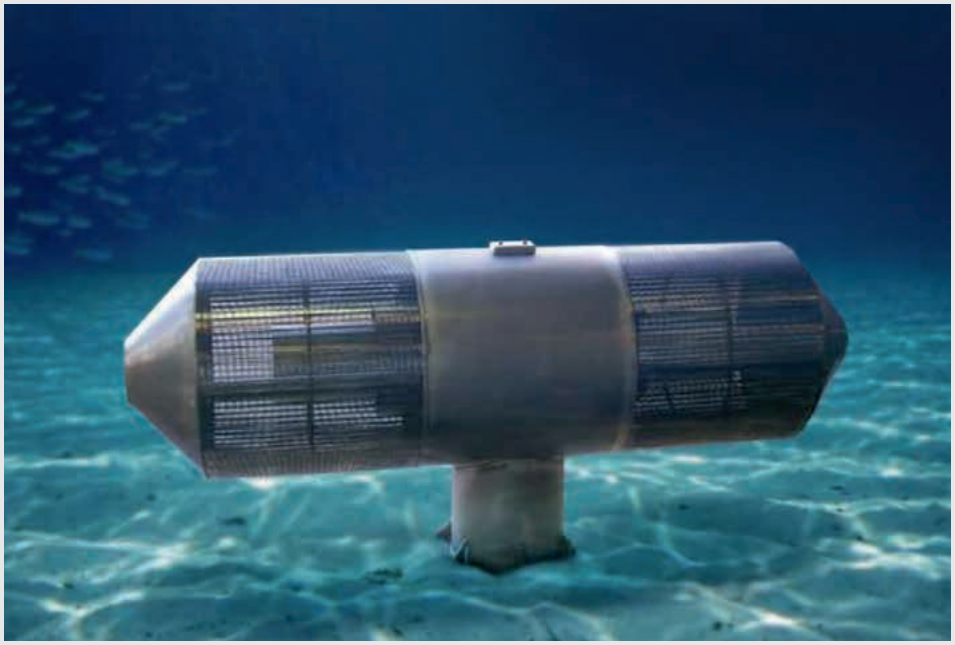
The Commission's Power Plant Siting Regulations require a Petition For Amendment to include 1) a discussion of how the modification affects the public; 2) a list of property owners potentially affected by the modification; and 3) a discussion of the potential effect on nearby property owners, the public and the parties in the application proceedings.

As described in technical area evaluated in Sections 3, 4, 5 and 6 of this Petition, with implementation of the existing conditions of certification the impacts of the proposed modifications are less than significant and therefore would not affect the public differently than the identified in the Final Decision.

PG&E has not included a list of property owners for this Petition because the property owners are the same as provided for the Commission during previous Petitions For Amendment.

Appendix A

Rotating Intake Screen Vendor Brochure



BILFINGER WATER TECHNOLOGIES

JOHNSON SCREENS® PASSIVE INTAKE SYSTEMS

JOHNSON SCREENS® high capacity passive intake screens provide uninterrupted water withdrawal from lakes, rivers and oceans. With over 30 years of intake screen experience and thousands of installations covering a variety of conditions, application engineers from Bilfinger Water Technologies can provide design and application assistance. From shallow rivers to deep oceans, the passive intake screen systems can meet site requirements anywhere in the world.

To provide maximum efficiency, the JOHNSON SCREENS® passive intake screens are custom designed and engineered to each unique environment, resulting in a system which costs less to install, operate and requires less maintenance.

The JOHNSON SCREENS® high capacity passive intake screens are constructed using non-plugging vee-Wire® with a patented internal dual flow modifier that creates a nearly uniform low flow velocity through the entire screen surface. This significantly reduces impingement and entrainment of debris while protecting aquatic life. Passive screens are designed to meet regulatory requirements for a maximum slot velocity for both entrainment and impingement. This velocity is typically 0.15 m/s which is the maximum velocity at which a juvenile fish can turn around, swim away and not be impinged onto a passive screen but the screens can be designed to the velocity requirements of the application. This, combined with a wide range of slot sizes (typically between 2 - 10 mm) determines our screen sizing. Furthermore, the large open area and low velocities result in a very low headloss in all applications, providing low overall operating costs.

Key Features

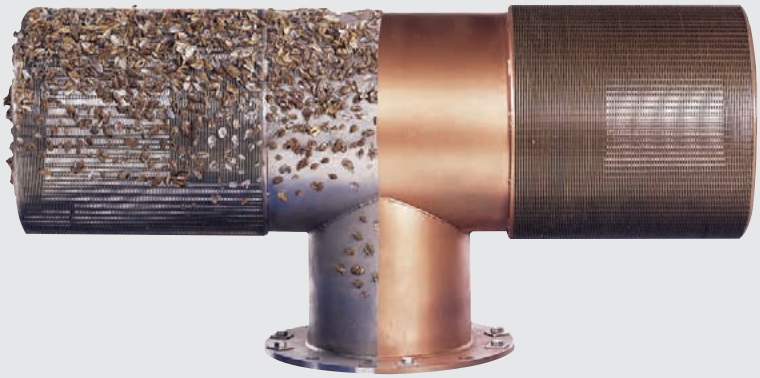
- Low capital costs and no moving parts, no power consumption, and low maintenance needs.
- Environmentally-friendly – this approach meets the US EPA's 316b regulations for fish protection.
- No waste stream – there is no debris brought to the surface to be handled or disposed of.
- Easy cleaning – with a periodic blast of compressed air using our Hydroburst™ system.
- Three standard configurations – drum, tee and half screens.
- Selection of materials – 304 stainless steel for fresh water and Z-alloy (CuNi) for repelling zebra mussel attachment and anti-bio fouling in seawater.
- Seawater applications – higher corrosion-resistant materials such as 316L, along with cathodic corrosion protection and duplex steels.
- Dual-flow modifier – provides low and even slot velocity (CFD modelling is available on demand).
- Patented internal flow modifier.

ADVANTAGES

- Highly efficient
- Custom-designed and engineered
- Low operating costs
- Low capital costs
- Environmentally-friendly: EPA Rule 316b-compliant and also compliant with UK fish protection laws
- Low head loss
- Proven technology for shallow water resources
- No waste stream

BILFINGER WATER TECHNOLOGIES

JOHNSON SCREENS® Vee-Wire®



JOHNSON SCREENS® Passive Intake Screen Z-Alloy (CuNi) to avoid zebra mussel growth

Internal Dual Flow Modifier

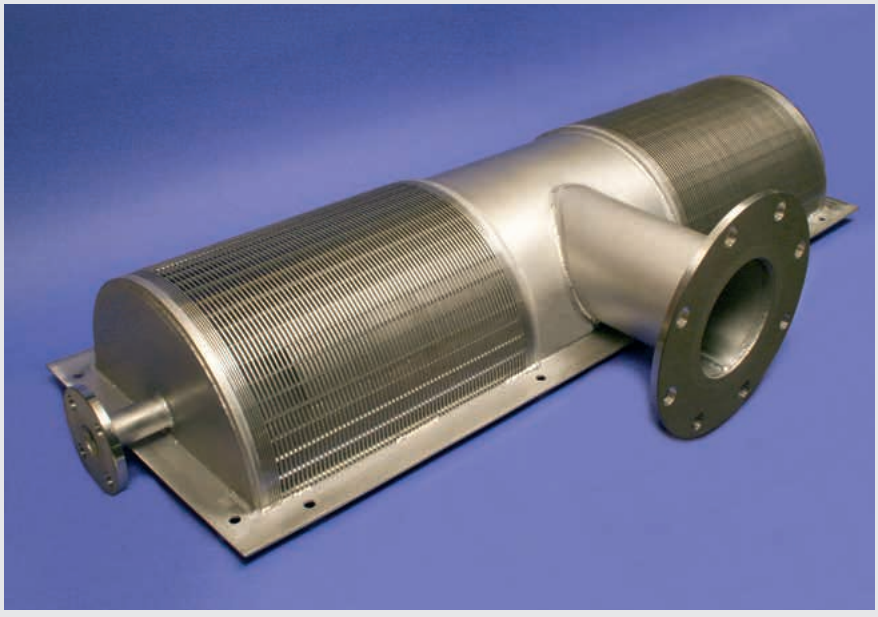
Early flow modifier designs, which included restrictive pipes using slots and holes, plugged easily and experienced a very high pressure drop across the screen surface area. The JOHNSON SCREENS® passive intake screen systems have an open pipe design that is much more effective, and is now the industry standard.
The key component of an intake screen system is the internal dual flow modifier. The even flow raises the overall efficiency of the screen to over 90 percent, which means more compact screen cylinders and Hydroburst™ components can be used.

The low pressure drop across the screen surface and through the screen body (lower head loss) reduces the amount of energy required to pull water through the screen, creating significant savings on operating costs.

Half Intake Screens: For Shallow Water

As water demands increase for cities, towns and industry, shallow water resources previously hard to withdraw from due to their lack of depth, have become a more viable option.

Our patented half screen has all the same attributes (low slot velocity, Hydroburst™ option, Vee Wire®, dual flow modifier, etc.) as the standard passive intake screens but can operate in a much lower depth of water. Our standard passive screens require approximately half a diameter clearance around the screen. The half screen sits flat on the bottom and only needs the top clearance.



Hydroburst™ Air-Backwash System: Maximizes Intake System Efficiency

Bilfinger Water Technologies developed the Hydroburst™ backwash system especially for conditions in which intake screens may need regular cleaning due to areas with high concentrations of debris or areas that are difficult to access.

Hydroburst™ with Surface Blast

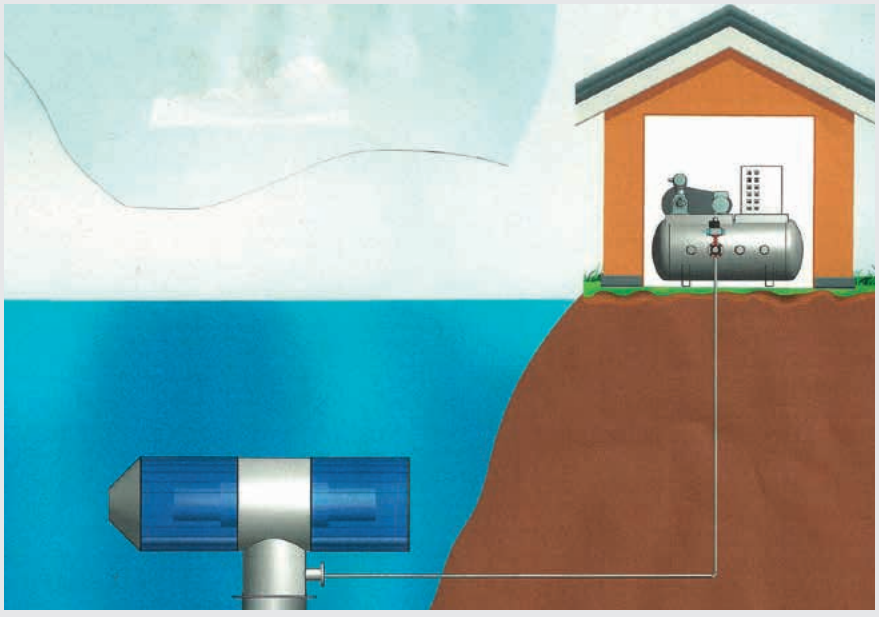
The process flushes the debris away from the screen surface by releasing a large volume of compressed air through the bottom of the screen within a few seconds. The typical backwash procedure cleans each water intake either sequentially or at regular intervals.

The Hydroburst™ basically consists of four main components typically pre-assembled on a skid:

1. A modern control panel, for manual or automatic operation.
2. A high-capacity receiver tank that stores the compressed air.
3. A high-capacity compressor, which supplies compressed air, needed to recharge the receiver tank.
4. Valves.
5. An optimized air distribution pipe assembly and nozzles inside the screen for even and efficient air distribution.

Hydroburst™ Air-Backwash System: Mode of Operation

With time, general debris will gather on the outer screen surface and will need periodic cleaning to keep the screen functioning continuously and properly. Our Hydroburst™ system offers an efficient method of regular cleaning without having to send divers in to clean the screens.



The Complete Hydroburst™ System

Our Hydroburst™ system is designed to deliver a sufficient volume of air in 3 – 5 seconds time – a real solid blast of air that has proven to work in all types of applications and conditions. This volume of air comes out from the bottom of the screen, and as it rises and expands, grabs and carries impinged debris away from the screen surface, returning the screen to a clean and efficient operating condition. Our application engineers evaluate screen size, depth and distance away in order to deliver the correct amount of air. Systems vary from operating a manual valve, to using a programmable timer system or automated PLC system that communicates to a central data control system / SCADA system for control.

JOHNSON SCREENS® Passive Intake Installation: Drinking Water Plant in South Carolina, USA

JOHNSON SCREENS® Passive Screen Installation for WE Power at Lake Michigan

Transport of JOHNSON SCREENS® Passive Screens to the Santa Maria Power Plant at a Site in Chile

Water Technologies

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Figures

PLANT NORTH

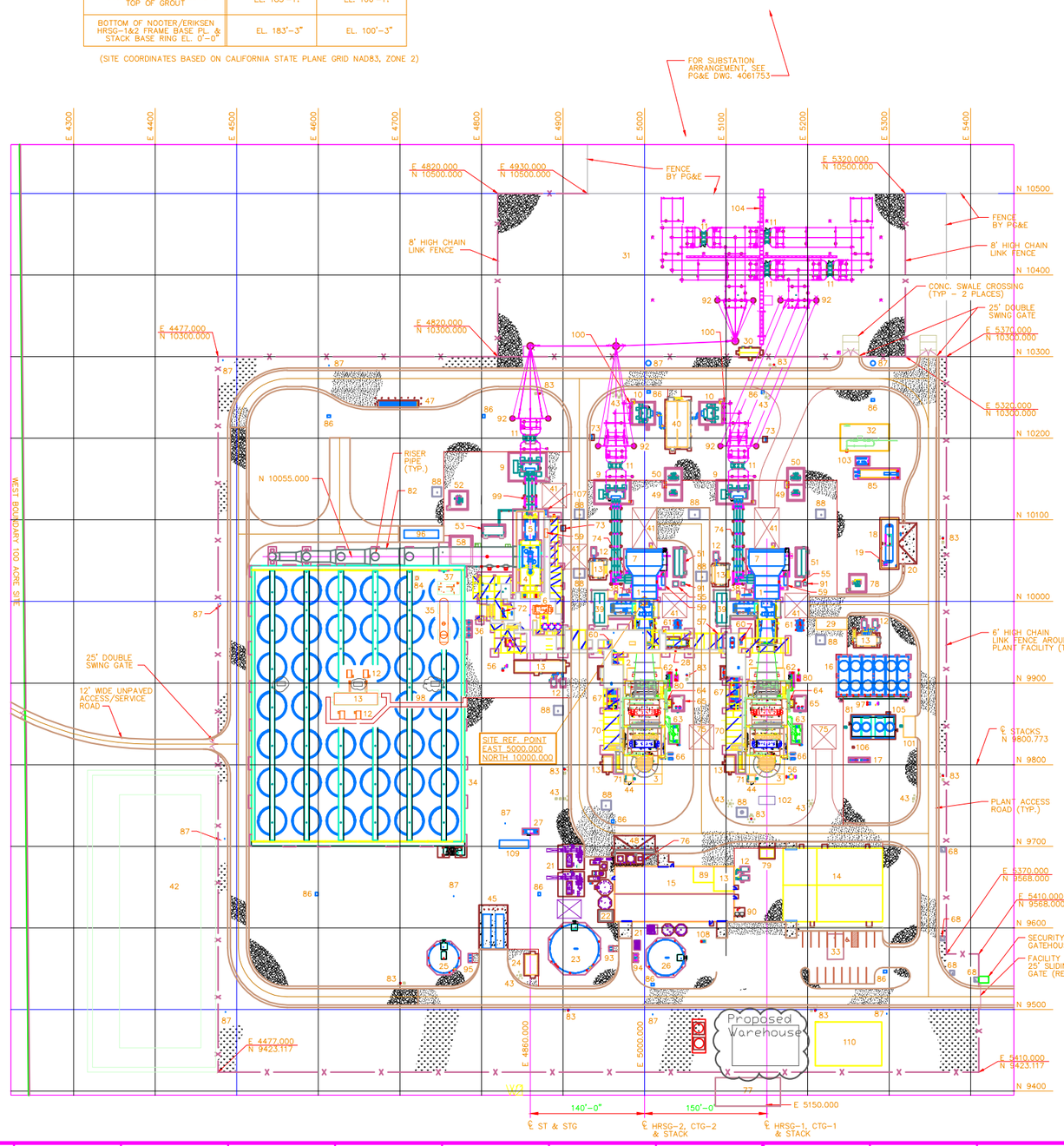
CALIFORNIA STATE PLANE GRID NORTH

0.6335° NTS

COORDINATE SYSTEM:

LOCATION	SITE COORDINATE	PLANT COORDINATE
CENTERLINE OF CTG-2 TURBINE BASE ANCHOR SUPPORT NORTH/ SOUTH	N 2259519.171	N 10000.000
CENTERLINE OF CTG-2 UNIT EAST/ WEST	E 6485331.470	E 5000.000
TOP OF CTG FOUNDATION CONC.	EL. 183'-0"	EL. 100'-0"
TOP OF HRSG FOUNDATION CONC.	EL. 183'-0"	EL. 100'-0"
CTG EQUIPMENT BASELINE TOP OF GROUT	EL. 183'-11"	EL. 100'-11"
BOTTOM OF NOOTER/ERIKSEN HRSG-1&2 FRAME BASE PL. & STACK BASE RING EL. 0'-0"	EL. 183'-3"	EL. 100'-3"

(SITE COORDINATES BASED ON CALIFORNIA STATE PLANE GRID NAD83, ZONE 2)



NEW PLANT DESCRIPTION

1 COMBUSTION TURBINE
2 HEAT RECOVERY SYSTEM GENERATOR (HRSG)
3 HRSG EXHAUST STACK
4 STEAM TURBINE
5 STEAM TURBINE GENERATOR
6 STEAM TURBINE LUBE OIL SKID
7 COMBUSTION TURBINE AIR INLET
8 NOT USED
9 GSU TRANSFORMER
10 STATION SERVICE TRANSFORMER
11 HIGH VOLTAGE BREAKER
12 SUS TRANSFORMERS
13 POWER DISTRIBUTION CENTER
14 ADMIN/CONTROL/MAINT/WHSE BUILDING (11,000 S.F.)
15 WATER TREATMENT BUILDING (10,000 S.F.)
16 FIN FAN COOLERS
17 CLOSED COOLING WATER PUMPS
18 AMMONIA STORAGE TANK
19 AMMONIA FORWARDING PUMPS
20 AMMONIA UNLOADING AREA
21 ZERO LIQUID DISCHARGE AREA (OUTDOOR)
22 WASTE WATER RECOVERY SUMP
23 RAW/ FIRE WATER STORAGE TANK
24 FIRE WATER PUMP HOUSE
25 DEMINERALIZED WATER STORAGE TANK
26 FILTERED WATER STORAGE TANK
27 OIL WATER SEPARATOR
28 SAMPLE PANEL ENCLOSURE
29 CYCLE CHEMICAL FEED SHELTER
30 SWITCHYARD CONTROL HOUSE (1,800 S.F.)
31 230KV SWITCHYARD
32 GAS METERING AREA
33 SEPTIC TANK
34 AIR COOLED CONDENSER (ACC)
35 CONDENSATE TANK AND DEAERATOR
36 CONDENSATE PUMPS
37 STEAM JET AIR EJECTOR (SJAE) SKIDS (HOLDING & HOGGING)
38 ACCESSORY MODULE
39 PACKAGED ELECTRICAL ELECTRONIC CONTROL CENTER (PEECC)
40 MEDIUM VOLTAGE SWITCHGEAR ENCLOSURE
41 PLANT MAINTENANCE AREAS
42 STORMWATER DETENTION BASIN
43 FIRE PROTECTION PIV
44 CEMS SHELTER
45 DEMINERALIZED WATER TRAILERS
46 NOT USED
47 HYDROGEN STORAGE AREA
48 CHEMICAL UNLOADING AREA
49 CTG EXCITATION TRANSFORMER
50 CTG ISOLATION TRANSFORMER
51 CTG LCI / EXCITATION COMPARTMENT
52 STG EXCITATION TRANSFORMER
53 STG EXCITATION COMPARTMENT
54 NOT USED
55 DC LINK REACTOR
56 AREA SUMP
57 WATER WASH SKID
58 ACC SUMP AND PUMPS
59 CO2 BOTTLE STORAGE RACK
60 CTG FIRE PROTECTION SKID
61 WASH WATER DRAIN TANK (UNDERGROUND)
62 DUCT BURNER SKID
63 AIG SKID
64 BLOWDOWN TANK
65 BLOWDOWN TANK SUMP AND PUMPS
66 RECIRCULATION PUMPS
67 FUEL GAS CONDITIONING SYSTEM SKID
68 ELECTRICAL HANDHOLE
69 NOT USED
70 BOILER FEEDWATER PUMPS
71 HRSG STAIRTOWER
72 GLAND STEAM CONDENSER
73 FIRE PROTECTION VALVE ENCLOSURE
74 AIR PROCESSING UNIT
75 HRSG CATALYST REMOVAL AREA
76 CHEMICAL STORAGE AREA
77 LEACH FIELD
78 ALTERNATE POWER TRANSFORMER
79 OIL & CHEMICAL STORAGE ENCLOSURE
80 DUCT BURNER FUEL GAS PRESSURE REDUCING STATION
81 WET SURFACE AIR COOLER (WSAC)
82 STEAM TURBINE DUCT
83 FIRE HYDRANT
84 A.C.C. CLEANING SKID
85 WATER BATH HEATER
86 STORM DRAINAGE CATCH BASIN
87 STORM DRAINAGE MANHOLE
88 ELECTRICAL MANHOLE
89 POTABLE WATER EQUIPMENT
90 COMPRESSED AIR EQUIPMENT
91 AC LINE REACTOR
92 DEAD END STRUCTURE
93 RAW WATER FORWARDING PUMPS
94 FILTERED WATER FORWARDING PUMPS
95 DEMINERALIZED WATER FORWARDING PUMPS
96 TEMPORARY CONDENSATE POLISHER
97 WET SURFACE AIR COOLER (WSAC) SUMP
98 PDC ASPHALT WALKWAY
99 PT & SURGE PROTECTION CUBICLE
100 CIRCUIT SWITCHER
101 WSAC CHEMICAL FEED SHELTER
102 CO2 RECOVERY AREA
103 FUEL GAS DRY SCRUBBER SKID
104 ELECTRICAL TRENCH
105 WSAC SAMPLE PANEL
106 CLOSED COOLING CHEMICAL FEED TANK
107 ST HYDROGEN GENERATOR
108 DEMIN TRAILER FEED PUMP
109 API EFFLUENT SUMP & PUMPS
110 WAREHOUSE

LEGEND

GRAVEL 0.015 — GRAVEL
CONC 0.015 — CONCRETE
ASPHLT 0.015 — ASPHALT
GRASS 0.01 — GRASS

50 0 50 100 150
SCALE: 1"=50'

REFERENCE DRAWINGS:

COLS-1-DW-111-002-001 OVERALL SITE PLAN
COLS-1-DW-111-002-003 WATER TREATMENT/ZLD AREA – GRADE EL.
COLS-1-DW-111-002-101 HRSG-1 AREA – GRADE EL.
COLS-1-DW-111-002-102 HRSG-1 AREA – EL. 155'-2"
COLS-1-DW-111-002-103 CT-1 AREA – GRADE EL.
COLS-1-DW-111-002-104 CT-1 & HRSG-1 AREA – EL. LOOKING EAST
COLS-1-DW-111-002-201 HRSG-2 AREA – GRADE EL.
COLS-1-DW-111-002-202 HRSG-2 AREA – EL. 155'-2"
COLS-1-DW-111-002-203 CT-2 AREA – GRADE EL.
COLS-1-DW-111-002-204 CT-2 & HRSG-2 AREA – EL. LOOKING WEST
COLS-1-DW-111-002-301 ST AREA – GRADE EL.
COLS-1-DW-111-002-302 ST AREA – EL. 121'-6"
COLS-1-DW-111-002-303 ST AREA – EL. 142'-9"
COLS-1-DW-111-002-304 ST AREA – ELEV. LOOKING NORTH
COLS-1-DW-111-002-305 ST AREA – ELEV. LOOKING EAST
COLS-1-DW-613-002-001 WATER TREATMENT BLDG. – F.F. EL. 99'-6"
COLS-1-DV-030001-COS-G-S0012.5KV SWITCHYARD SITE PLAN

REV	DATE	DESCRIPTION	DRAWN	CHECKED	LEAD DESIGNER	ENGINEER/TECH SPECIALIST	PROJECT ENGINEERING MANAGER	PROJECT MANAGER
A	10/16/09	GENERAL OVERALL UPDATES	RWB	JW	KE	SJR	BMW	MAG
B	10/16/09	PER TRUE NTE	RWB	JW	KE	SJR	BMW	MAG
C	10/16/09	REV. ARRANGEMENT OF SOUTHWEST CORNER AS INDICATED	RWB	JW	KE	SJR	BMW	MAG
D	10/16/09	REVISED AS INDICATED	RWB	JW	KE	SJR	BMW	MAG
E	10/16/09	REVISED AS INDICATED	RWB	JW	KE	SJR	BMW	MAG
F	10/16/09	REVISED AS INDICATED	RWB	JW	KE	SJR	BMW	MAG
G	10/16/09	GENERAL UPDATES	RWB	JW	KE	SJR	BMW	MAG
H	10/16/09	GENERAL UPDATES	RWB	JW	KE	SJR	BMW	MAG
J	10/16/09	GENERAL UPDATES	RWB	JW	KE	SJR	BMW	MAG
K	10/16/09	INITIAL PROGRESS ISSUE	RWB	JW	KE	SJR	BMW	MAG

PRELIMINARY STATUS — DATE — REPRESENTS GENERAL DESIGN CONCEPTS BASED ON ASSUMPTIONS. REVIEWED NOT CHECKED.
LEAD: S.J. RUZZIN — 01/16/08
APPROVED STATUS — DATE — REPRESENTS REVIEWED AND APPROVED DESIGN. ANY PORTION MARKED "HOLD" RETAINS PRELIMINARY STATUS.
LEAD:

ORIGINATING PERSONNEL — PROFESSIONAL ENGINEER'S SEAL
DRAWN BY: R.W.B.
CHECKED BY: J.L. WORK
LEAD DESIGNER: K.E. ERFERDOH
ENGINEER/TECH SPECIALIST: S.J.R. RUZZIN
PROJECT ENGINEERING MANAGER: B.M. WITZEL
PROJECT MANAGER: M.A. GENGER

Zurn Nepa — Leadership Into Industrial Gas Turbines

PROFESSIONAL ENGINEER'S SEAL — PREPARED UNDER THE RESPONSIBLE SUPERVISION OF: PEL: STATE: LIC. NO.: DATE:

WorleyParsons resources & energy

Gemma Power Systems California, Inc.

PG&E Pacific Gas and Electric Company

COLUSA GENERATING STATION

GENERAL ARRANGEMENT
SITE PLAN

FIGURE 2-1

SCALE: 1"=50' — DRAWING SIZE: ANSI E (44" x 34")

WORLEYPARSONS DWG. NO.: COLS-1-DW-111-002-002 — REV: L

VHL: Mon Oct 05 09:47:12 2009

FIGURE 2-2 PHOTO LOOKING NORTH

FIGURE 2-3 PHOTO LOOKING WEST

ROADWAY

SLOPE

EXISTING GRADE LINES

(N) Compressor Pad

(N) Compressor

8'–6"

(N) Compressor Switch

6'–0"

(N) Compressor Junction Box

(E) Water Pipe

(N) Concrete Bollard

(N) Light Pole

(N) Air Pipe (Underground)

(N) Electrical Conduit for Lighting
2'-6" Under ground

(E) Junction Box & Switch

(N) 4" Conduit to
Compressor Pad
(Under ground)

(N) Light Pole

(E) Concrete Bollard

(N) Electrical Conduit for Lighting Switch
2'-6" Under ground

(E) Fence

(E) Concrete Bollard

ROADWAY

CANAL

(N) Switch Box for Lights

1
C-1 SITE PLAN

Scale: 1/4"=1'-0"

PRELIMINARY-
NOT FOR
CONSTRUCTION

FIGURE 2-4 Rotating Intake Screen Component Layout

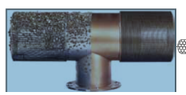
CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621
Web: www.choweng.com Email: info@choweng.com
Phone: (510) 636-8500 Fax: (510) 636-8544

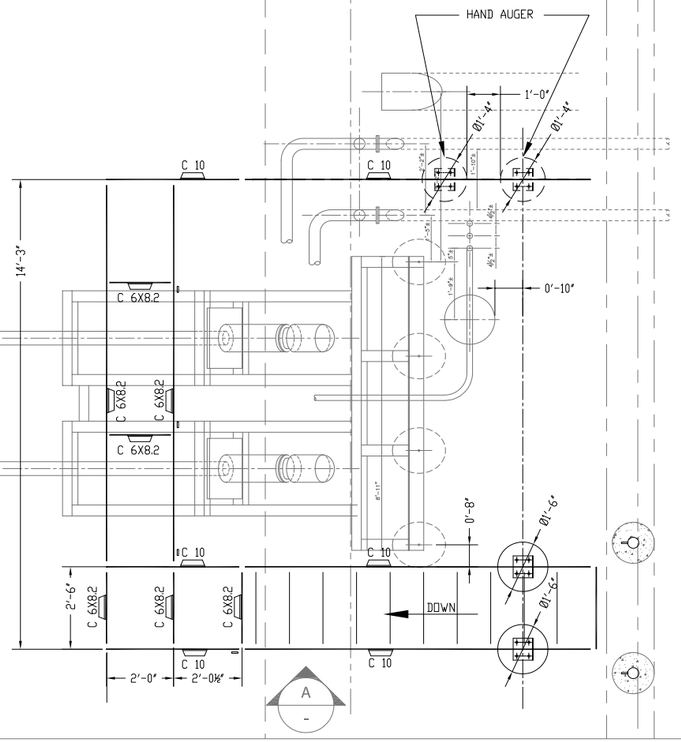
REVISIONS

SITE PLAN
PG&E TRASH FILTER PROJECT, COLUSA

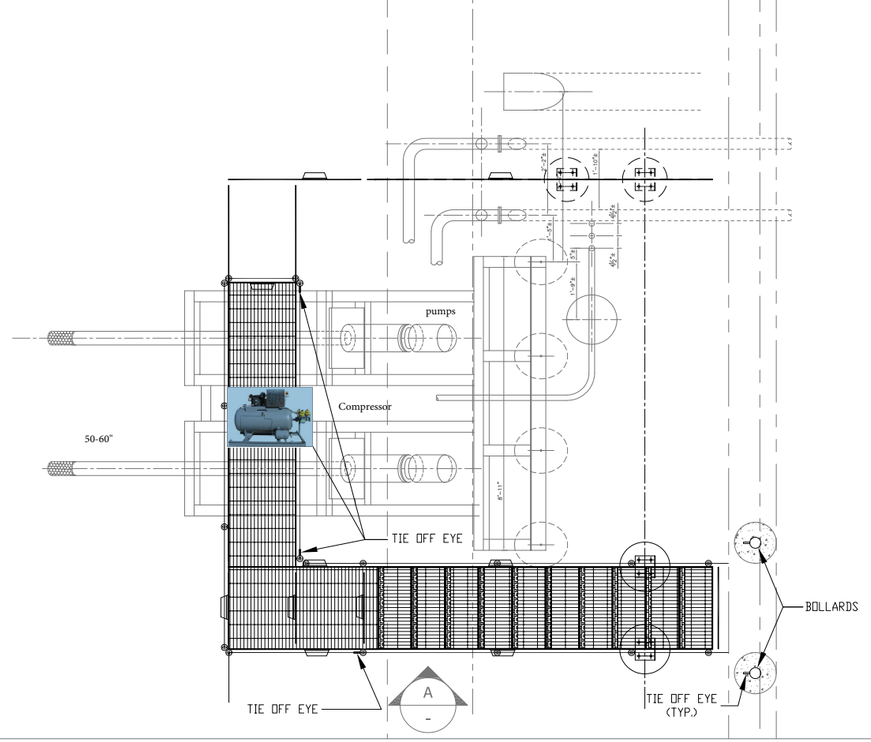
POWER GENERATION - ENGINEERING
PACIFIC GAS AND ELECTRIC COMPANY
MAXWELL, CALIFORNIA

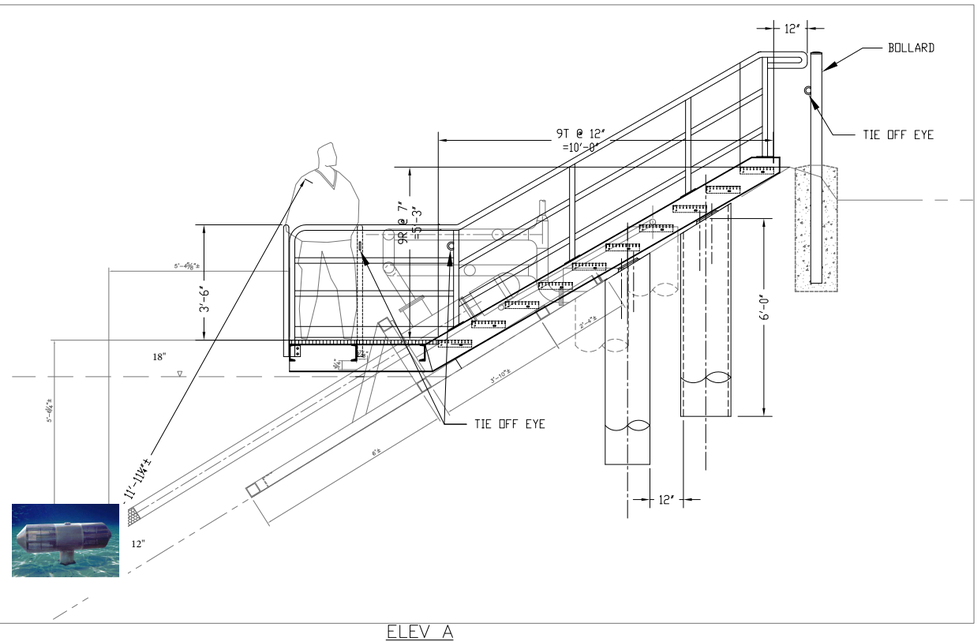
C-1 - SITE PLAN



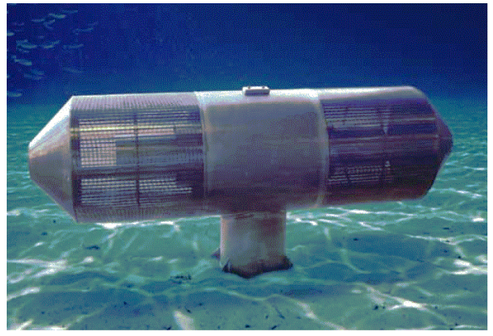


FRAMING PLAN





ELEV A



Water intake Screen

FIGURE 2-5 Locations of Intake Screens and Compressor

REVISIONS	DRAWN	DATE

CHOW ENGINEERING, INC.
7770 PARDEE LANE, SUITE 100
OAKLAND, CA 94621
Phone: (510) 636-8500 Fax: (510) 636-8544
Web: www.choweng.com E-Mail: info@choweng.com

SHEET TITLE: PLATFORMS
CANAL PLATFORM

OWNER: PG&E
PACIFIC GAS & ELECTRIC COMPANY
COLUSA GENERATING STATION
MAXWELL, CA.

STAMP

DATE	03/10/11
DRAWN	CM
CHECKED	MR
JOB NO.	11R-103
SCALE	
DRAWING No.	S-3
SHEET No.	4 OF xx
REV.	0

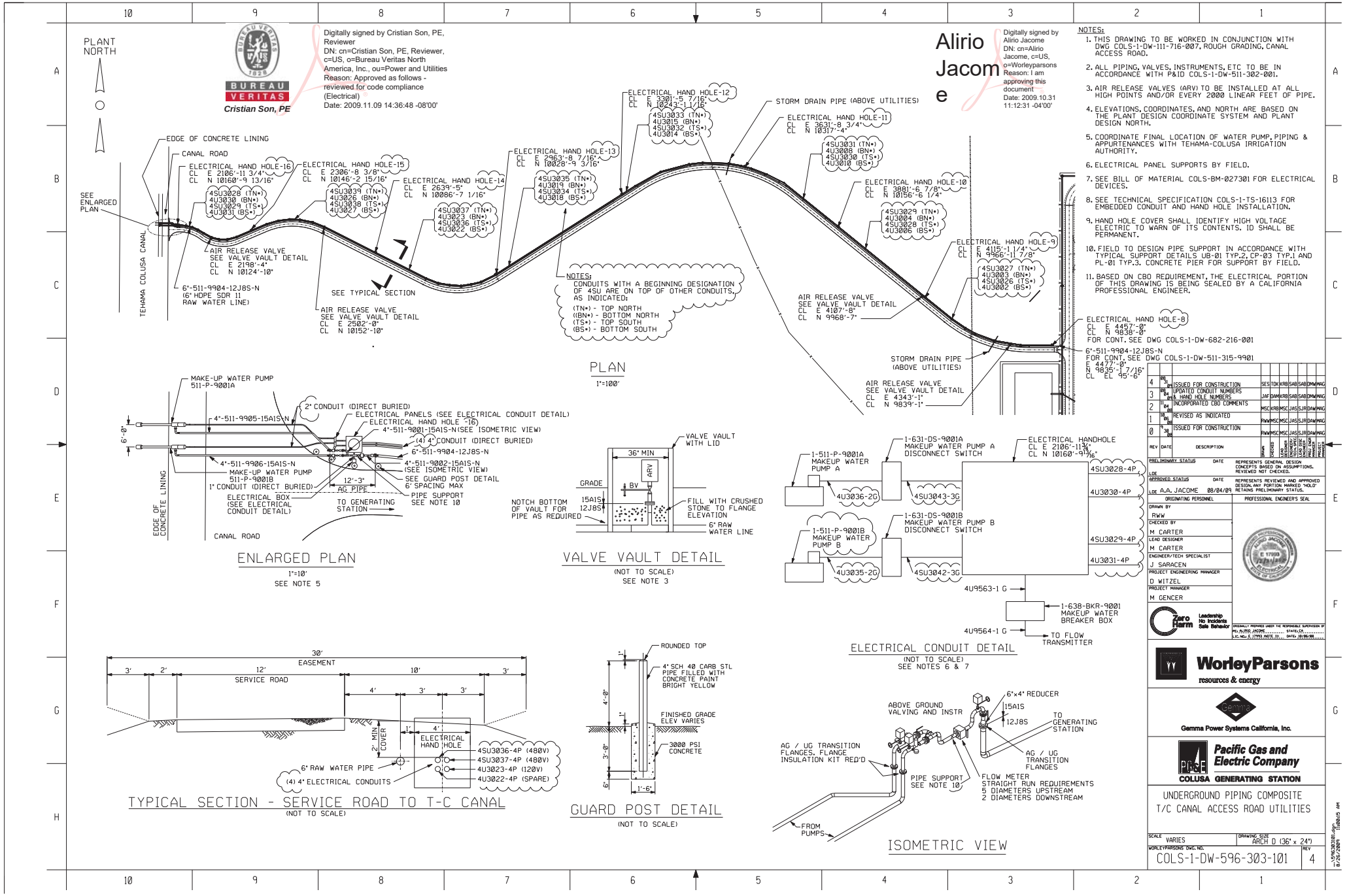


FIGURE 2-6 Location of the Pull Boxes