5.15 Water Resources

5.15.1 Introduction

On August 16, 2001, GWF Energy LLC filed an Application for Certification (AFC) with the California Energy Commission (CEC) for the Tracy Peaker Project (TPP). The CEC found the AFC data adequate on October 17, 2001. The CEC released a staff assessment on December 28, 2001, and a supplemental staff assessment on February 1, 2002. The CEC published its Presiding Member's Proposed Decision on May 31, 2002, with the project receiving its Final Decision on July 17, 2002. These documents are incorporated by reference into this AFC and are presented in electronic form in Appendix 1A.

Section 5.15.2 evaluates the project's compliance with applicable laws, ordinances, regulations, and standards (LORS). Section 5.15.3 describes the affected environment, and Section 5.15.4 analyzes the project's environmental impacts on water resources. Section 5.15.5 presents proposed mitigation measures. Section 5.15.6 discusses cumulative project impacts. Section 5.15.7 identifies the involved agencies and agency contacts, and Section 5.15.8 lists required permits and permit schedules. Section 5.15.9 provides the references used to prepare this section.

5.15.2 Laws, Ordinances, Regulations, and Standards

Federal, state, and local LORS applicable to water resources and conformance are discussed in this section and summarized in Table 5.15-1.

TABLE 5.15-1
Laws, Ordinances, Regulations, and Standards for Water Resources

LORS	Requirements/Applicability	Administering Agency	AFC Section Explaining Conformance
Federal			
Federal Clean Water Act of 1977 (as amended)	Prohibits discharge of pollutants to receiving waters unless the discharge is in compliance with a National Pollution Discharge Elimination System (NPDES) permit.	Central Valley RWQCB	Sections 5.15.4.2 and 5.15.4.4.
State			
Constitution, Article X, Section 2	Prohibits waste or unreasonable use of water.	Central Valley RWQCB	Section 5.15.4.3
Water Code, Section 13550	States that use of potable water for non-potable purposes is an unreasonable use of water.	Central Valley RWQCB	Section 5.15.4.3
SWRCB Resolution 75-58	Encourages use of wastewater for power plant cooling	Central Valley RWQCB	Section 5.15.4.3
Porter-Cologne Water Quality Control Act	Governs the regulation of water quality within California and authorizes preparation of Basin Plans.	Central Valley RWQCB	Sections 5.15.4.2 and 5.15.4.4.

5.15.2.1 Federal LORS

5.15.2.1.1 Clean Water Act

The Clean Water Act authorizes the U.S. Environmental Protection Agency (EPA) to regulate discharges of wastewater and stormwater into surface waters by issuing NPDES permits and setting pretreatment standards. In California, the State Water Resources Control Board (SWRCB), acting through its Regional Water Quality Control Boards (RWQCB), implements these permits consistent with a Memorandum of Understanding with EPA. For this reason, relevant NPDES permits are discussed below under state LORS.

5.15.2.2 State LORS

5.15.2.2.1 California Constitution, Article X Section 2, California Water Code Sections 13550 and 13551, and SWRCB Resolution 75-58

Article X of the California Constitution prohibits waste or unreasonable use of water. California Water Code Sections 13550 and 13551 encourage the conservation of potable water resources and the maximum reuse of wastewater to conserve potable water, particularly in areas where recycled water of adequate quality is available at reasonable cost. It requires the use of reclaimed water, where available, for nonpotable uses, and states that the use of potable domestic water for nonpotable uses, including industrial uses, is considered 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.

Resolution No. 75-58 provides statewide water quality principles for adoption of discharge requirements and implementation actions for power plants that depend upon inland waters for cooling. This policy also provides guidance in the planning of new power plants to encourage the use of wastewater for cooling where appropriate, thus minimizing the use of potable water.

5.15.2.2.2 Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act authorizes implementation of a statewide program to control the quality of all waters of the state. The act establishes the state and regional water quality control boards as the state agencies with the primary responsibilities for coordinating and controlling water quality. It requires that SWRCB, or the appropriate RWQCB, adopt water quality control plans (or Basin Plans) for the protection of water quality. A Basin Plan contains the following:

- Beneficial uses of water to be protected;
- Water quality objectives for the reasonable protection of the beneficial uses; and a
- Program of implementation for achieving the water quality objectives.

Under the authority of the Porter-Cologne Act and as delegated by EPA, SWRCB and the Central Valley RWQCB implement the Clean Water Act in the project area. Relevant LORS are described below.

Construction Stormwater NPDES Permit

SWRCB implements regulations under the federal Clean Water Act requiring stormwater discharges associated with construction activity to be regulated by an NPDES permit. SWRCB has adopted a statewide General Permit for Stormwater Discharges Associated with Construction Activity (General Construction Permit) that applies to projects resulting in one

or more acres of soil disturbance (Order 99-08-DWQ). The construction of GWF Tracy would result in disturbance of more than one acre of soil; therefore, the project will require coverage under the statewide General Construction Permit. This includes the preparation of a Stormwater Pollution Prevention Plan (SWPPP) that would specify site management activities to be implemented during site development. These management activities could include construction stormwater best management practices (BMPs), dewatering runoff controls, and construction equipment decontamination.

Industrial Stormwater NPDES Permit

SWRCB has issued Waste Discharge Requirements (WDRs) for discharges of stormwater associated with industrial activities (such as GWF Tracy), excluding construction activities (NPDES Permit CAS000001, Order 97-03-DWQ). The project will require an industrial activities SWPPP that would specify management measures necessary to meet WDRs to ensure receiving water quality is protected. SWRCB requires a Notice of Intent to be filed prior to any stormwater discharge from industrial activities, and that the SWPPP be implemented and maintained on site.

5.15.2.3 Local LORS

Chapter 9-1400 of the San Joaquin County Ordinance provides a permitting process for construction excavation, grading, and earthwork within San Joaquin County. The ordinance requires the preparation and submittal of a drainage, erosion, and sedimentation control plan to minimize impacts to waters of the State as a condition of securing a building permit.

5.15.3 Affected Environment

5.15.3.1 Hydrologic Setting

5.15.3.1.1 Surface Water

GWF Tracy is located within the San Joaquin Basin, which includes the San Joaquin Valley, the eastern slope of the Coast Ranges, and the western slope of the Sierra Nevada. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Calaveras, Mokelumne, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno rivers. Major reservoirs include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones. Runoff from the Sierra Nevada and Coast Ranges supplies the San Joaquin River with fresh surface water before eventually flowing out to the Sacramento–San Joaquin Delta. GWF Tracy is not located near any of these surface water features.

In addition to the rivers, surface water is imported to the basin through several main canals via the State Water Project (SWP) and the federal Central Valley Project (CVP). These canals include the Delta-Mendota Canal (CVP) and the California Aqueduct (SWP). The Delta-Mendota Canal and California Aqueduct carry fresh water from the Sacramento and San Joaquin River systems to a network of local canals and irrigation ditches. These sources provide water to agricultural lands as well as cities and industries throughout the San Joaquin Valley region and Southern California. The Delta-Mendota Canal is adjacent to the GWF Tracy site, and the California Aqueduct is approximately one-half mile southwest of the site (Figure 5.15-1).

5.15.3.1.2 Groundwater

GWF Tracy is located within the southern two-thirds of the Central Valley aquifer system, which is made up of post-Eocene continental rocks and deposits and contains most of the fresh water in the valley. Below the continental deposits are tertiary marine sediments that contain mostly saline water, except in certain areas where an influx of fresh water has flushed out the saline water.

The aquifer system in the San Joaquin Valley generally consists of an upper and a lower aquifer, which are separated by a relatively thick clay layer of regional extent called the Corcoran Clay member of the Tulare Formation (shown as E-clay on Figure 5.15-2). Several of these clay beds were deposited in a lake that once occupied the San Joaquin Valley trough. The Corcoran Clay is approximately 450 feet below ground surface and is approximately 50 to 100 feet thick. The Corcoran Clay is silty, diatomaceous clay with low permeability and is one of the largest confining bodies in the region, underlying an area of approximately 5,000 square miles. In general, clay zones are impermeable aquitards that restrict vertical and lateral movement of groundwater. Movement of groundwater through soil can be retarded or terminated by aquitards.

Although the Corcoran Clay is believed to be a competent barrier between the upper and the lower aquifers in the southern sections of the San Joaquin Valley, the Corcoran Clay pinches out and begins to disappear as it moves north toward the GWF Tracy site. Where the Corcoran Clay disappears, the lower aquifer is no longer isolated from the upper aquifer. The absence of the Corcoran Clay allows the regional groundwater flow to be affected by numerous lenses of fine-grained materials that are distributed throughout the aquifer. These fine-grained lenses have a combined thickness of several thousand feet.

5.15.3.2 Flood, Tsunami, and Seiche

The Federal Emergency Management Agency has not published flood insurance rate maps for the GWF Tracy area. No nearby areas, however, are designated as special flood hazard areas; therefore, it is unlikely that the project site is subject to flooding. The GWF Tracy site is not in an area subject to flooding from a tsunami or seiche.

5.15.3.3 Precipitation and Drainage

5.15.3.3.1 Climate and Precipitation

The Tracy area is arid to semiarid, with hot summers and mild winters. Most of the yearly precipitation falls between the months of October and May. Table 5.15-2 lists the average monthly maximum temperatures, the average monthly minimum temperatures, and the average monthly rainfall recorded at the Tracy Carbona weather station from 1927 through 2000. Average annual rainfall is 9.99 inches.

TABLE 5.15-2
Monthly Climate Summary at Tracy (December 1, 1927 to July 31, 2000)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (degrees F)	54.1	61.0	66.7	73.4	80.6	88.1	93.8	92.4	87.9	78.6	64.9	54.7	74.7
Average Min. Temperature (degrees F)	36.7	40.0	42.5	45.6	50.0	54.8	56.8	55.6	53.9	48.7	42.1	36.6	46.9
Average Total Precipitation (in.)	1.93	1.71	1.41	0.84	0.50	0.09	0.03	0.09	0.24	0.53	1.13	1.49	9.99

Note: Percentages of possible observations for period of record: maximum temperature; 94.9%; minimum temperature, 94.4%; precipitation, 95.8%; snowfall, 97.0%.
Source: Western Regional Climate Center, 2001.

5.15.3.3.2 Stormwater Runoff

The GWF Tracy site is currently developed, including drainage improvements as shown on Figures 5.15-3a through 5.15-3d. These figures also show the proposed drainage pattern for GWF Tracy. Runoff from the project would be managed with the use of trench drains, shallow ditches, culverts, and storm piping systems. All of the stormwater runoff would be collected into a retention pond and would rely on percolation and evaporation for drainage of the pond. The existing storm drainage system within the existing power block area and most of the remainder of the existing developed site would not be altered, but the existing retention basin would be replaced by a new, larger pond. Natural drainage outside of the plant fence line would not be altered.

5.15.3.4 Water Supply, Use, and Disposal

This section characterizes the quantity of the water required for GWF Tracy project, the sources of the water supply and wastewater discharge, and treatment and disposal methods.

5.15.3.4.1 Water Supply and Use

Byron-Bethany Irrigation District (BBID) would supply GWF Tracy with water from the Delta-Mendota Canal using the existing pipeline developed for the original project. The project does not include a cooling tower and would, therefore, have a minimal water demand. Average annual water consumption from the canal is approximately 54.4 acre-feet, based on 8,000 hours of operation.

Water at the site would be used for fire protection, evaporative cooling in the air intake, heat recovery steam generator (HRSG) makeup, auxiliary boiler makeup, steam turbine lubricating oil wet surface air cooler (WSAC), to wash the combustion turbine compressors, and miscellaneous plant uses. The evaporative cooling and boiler makeup water uses will be processed through the reverse osmosis and portable ion exchange systems prior to use. The WSAC and miscellaneous plant (wash water) water will not be treated prior to use. Bottled water will be used on site for domestic purposes. Total daily and average annual water use projected for GWF Tracy is shown in Table 5.15-3.

TABLE 5.15-3
Daily and Annual Water Use for GWF Tracy Operations

Water Use	Water Source	Daily Use (gpm)		Annual Use (AFY)
		Average	Maximum[a]	
Raw Water	Delta-Mendota Canal	37	156	54.4
Demineralized Water	Delta-Mendota Canal	46[b]	70[b]	NA
Evaporative Cooler	Delta-Mendota Canal	21	49	NA
Steam Turbine Lubricating Oil Cooling	Delta-Mendota Canal	7	95	NA
Plant Service Water (intermittent use)	Delta-Mendota Canal	<1	<1	NA

[a] Maximum water requirements are based on 98º F ambient temperature.
[b] Demineralized water used for HRSG makeup, intermittent auxiliary boiler makeup, and turbine wash water

AFY = acre-feet per year (based on an annual operation of 8,000 hours/year at full plant output)
gpm = gallons per minute
NA = not applicable

5.15.3.4.2 Wastewater Discharges and Disposal

The plant would be a near-zero wastewater discharge facility. Small quantities (less than 1 gallon per minute) of industrial wastewater from the plant would be stored on site and periodically transported from the plant via licensed haulers for offsite recycle or disposal. Industrial wastewater and contact stormwater runoff from the plant would be stored in an onsite storage unit and eventually transported off site by truck. Noncontact stormwater from the plant site would be channeled and directed to an onsite evaporation/percolation basin. All sanitary wastewater would be routed on site to an existing septic tank/leach field. All other wastewater generated would be handled and disposed of according to standard procedures and all applicable LORS.

A wastewater recovery system would be used to reduce the volume of wastewater produced by the plant. The small quantity of wastewater remaining would be sent to a 10,000-gallon storage tank for offsite recycle or disposal.

5.15.4 Environmental Analysis

This section evaluates the potential impacts of GWF Tracy on various water resources. Consistency with state water policy and power plant cooling water policy are also examined. Consistent with the California Environmental Quality Act (CEQA) Guidelines, GWF Tracy is determined to have a significant effect on the environment if it would:

- Substantially degrade water quality;
- Contaminate a public water supply;
- Substantially degrade or deplete groundwater resources;
- Interfere substantially with groundwater recharge;
- Encourage activities that result in the use of large amounts of water;
- Use water in a wasteful manner;
- Cause substantial flooding, erosion, or siltation; or
- Substantially diminish habitat for fish, wildlife, or plants.

5.15.4.1 Groundwater Impacts

GWF Tracy is not expected to have an impact on local and regional groundwater. The project would not directly withdraw groundwater from the area. The onsite evaporation/percolation basin would contain noncontact stormwater, and, therefore, would not cause an impact on local and regional groundwater.

5.15.4.2 Surface Water Hydrology and Drainage

Potential surface water impacts resulting from GWF Tracy include the disruption of surface runoff patterns during the construction phase, and stormwater management requirements during the operations and maintenance phase.

During construction of GWF Tracy, approximately 12.3 acres would be temporarily disturbed at the site for construction laydown and staging located on the 40-acre parcel, which were previously disturbed during construction of TPP. An additional 3.28 acres would be permanently disturbed for the relocation of the stormwater retention basin. The project site generally slopes toward the northeast. Grading during construction would alter existing drainage patterns on the site. However, the plant footprint and other disturbed areas would not encroach on surface water features.

To reduce potential impacts to surface water hydrology and drainage from construction activities, a SWPPP will be developed and implemented in accordance with the NPDES General Permit for Stormwater Discharges Associated with Construction Activity, as described in Section 5.15.5 and Appendix 5.11A. The SWPPP will establish best engineering management practices and drainage controls intended to design the use and placement of BMPs to prohibit the entry of pollutants from the construction site into stormwater during construction. A stormwater monitoring program would also be implemented for construction activities at the site which will determine the potential impacts of stormwater on waters of the State. In order avoid potential impacts related to excess erosion and pollutant loading, surface water runoff will be directed around the construction site to the maximum extent feasible. With implementation of the SWPPP in accordance with the NPDES General Permit, impacts to surface water hydrology and drainage during construction will be less than significant.

Following the completion of construction activity, contact stormwater (runoff from the equipment areas on the site) would be controlled and contained within the plant area by an industrial wastewater collection system, which will be stored in an onsite holding tank and eventually transported off site via truck for disposal by a licensed hauler. The noncontact stormwater drainage system would be designed to accommodate runoff from a maximum 25-year, 24-hour rainfall event. Drainage at the site would be designed to prevent flooding of permanent facilities and roads. As a result of these project design features, no post-construction impacts to surface water quality due to local flooding are expected.

The post-construction site grading and drainage will be achieved through a balanced cut-and-fill approach. The final site grading and drainage will be designed to contain all runoff or drainage within the plant fence line. Runoff and noncontact stormwater will be directed by grading to drains or to a culvert system that will drain into the stormwater percolation/evaporation basin. The natural drainage outside of the plant fence line will not be altered.

5.15.4.3 Water Supply and Use

Process and other water requirements for GWF Tracy would be met by the property's existing water allocation and pipeline from BBID. As the owners of the overall 40-acre project site, GWF has the right to 136 AFY of water, significantly more than the incremental increase of 25.5 AFY expected to be used by the project. In addition, GWF would also have access to 120 AFY of water from the Tracy Biomass facility as a backup source. Because water for plant operation would be supplied under a pre-existing agreement, the project would not place any additional or new demand on BBID water supplies and is, therefore, not projected to cause a significant impact on water supply.

Under the SWRCB Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted on June 19, 1975, as Resolution 75-58), the use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. In the 2003 Integrated Energy Policy Report, the CEC adopted a policy stating it will approve the use of fresh water for cooling purposes by power plants only where alternative water supply sources and alternative cooling technologies are shown to be "environmentally undesirable" or "economically unsound."

GWF Tracy is consistent with SWRCB Resolution 75-58 and the CEC's fresh water policy. Only a very small increase in water consumption will be associated with the project because it does not involve a cooling tower, as discussed in Section 5.15.3.4.1. Moreover, GWF Tracy's limited water demand can be met by the property's existing water allocation, thereby eliminating the need to procure additional water supplies or construct new water supply infrastructure, such as pipelines. If new infrastructure were required, construction costs would reduce the economic feasibility of the project while construction activities could significantly increase environmental impacts related to water quality, air quality, soils, traffic, and biological resources. Therefore, GWF Tracy's use of the property's existing water allocation eliminates the need to construct new water supply infrastructure that would be both "environmentally undesirable" and "economically unsound."

5.15.4.4 Stormwater Quality

During construction, 16.38 acres of land would be disturbed. Activities such as grading can potentially increase rates of erosion during construction. In addition, construction materials could contaminate runoff or groundwater if not properly stored and used.

To address impacts from erosion during construction, the SWPPP will implement erosion and sediment controls, surface water pollution prevention measures, and other BMPs in accordance with the NPDES General Permit. The SWPPP will identify construction BMPs to ensure compliance with all water quality standards of the NPDES General Permit so that no violations of receiving water standards occur. The BMPs will be site-specific and will be modified during construction depending on the phase of construction and weather conditions pursuant to the procedures established in the SWPPP. BMPs to be contained in the SWPPP will include: erosion controls (such as soil binders), sediment controls (such as gravel barriers and silt fencing), masonry and paint waste management controls, hazardous material protected programs, material storage and waste management controls, tracking controls (such as protected construction site entrances), wind erosion controls, dry weather flow management, and training components. Successful implementation of the SWPPP will

ensure that construction impacts to water resources are mitigated to a less-than-significant level. Following construction, all drainage will be maintained on site (directed to an onsite stormwater evaporation/percolation basin) and will not interfere with the historical drainage patterns of adjoining properties. The runoff from the project would be managed with the use of trench drains, shallow ditches, culverts, and storm piping systems. All of the stormwater runoff would be collected into a retention pond to the west of the air-cooled condenser and would rely on percolation and evaporation for drainage of the pond. Natural drainage outside of the plant fence line would not be altered.

5.15.4.5 Wastewater Disposal

A wastewater recovery system would be used to reduce the volume of wastewater produced by the plant. The system would consist of a packaged softening/filtration/reverse osmosis system. The water recovered by the wastewater treatment system would be routed to the reverse osmosis product tank for use as makeup water to the evaporative coolers. The small quantity of wastewater from the final reverse osmosis stage would be sent to a 10,000 gallon storage tank for offsite recycle or disposal. Uncontaminated rainwater would be allowed to flow through a stormwater system, grading to an onsite, unlined, evaporation/percolation basin.

5.15.5 Mitigation Measures

This section presents mitigation measures proposed to reduce impacts to water resources in areas affected by the project.

- In accordance with the NDPES General Permit, a SWPPP shall be prepared prior to the start of project construction to implement BMPs designed to minimize soil erosion and sediment transport during construction of the plant site and project linear features. The SWPPP will identify appropriate erosion and sediment controls for slopes, catch basins, culverts, stream channels, and other areas prone to erosion. BMPs for material management will also be implemented in accordance with the SWPPP. See Appendix 5.11A for the Draft Construction SWPPP.

- Operations at the GWF Tracy site will be conducted in accordance with the statewide General Permit for Industrial Activities. A suite of good housekeeping requirements will be implemented, including steps to identify and mitigate pollutants and conditions of concern. BMPs will be selected for implementation during operation to address the potential pollutants generated on site and address industrial areas exposed to the elements, material loading and storage areas, dust generating activities, spill and leak prevention, potential non-stormwater flows and prohibitions on discharge of certain non-stormwater flows (such as boiler blowdown, reverse osmosis reject streams), waste handling, and employee training. Inspections and monitoring (including sampling) will be conducted per the requirements of the statewide General Permit. The BMPs will be designed and implemented to prevent or control pollutants potentially associated with the operation of the plant from entering storm drains in accordance with the SWPPP.

Compliance with these programs would ensure that all residual impacts associated with the proposed project are mitigated to a less-than-significant level.

5.15.6 Cumulative Effects

Cumulative effects to water resources could occur through the use of groundwater, the contribution of sanitary wastewater, or stormwater runoff. None of these categories of water use is expected to result in significant cumulative effects to area water resources:

- **Water Supply:** The project is expected to result in a very small increase in water use of 24.9 acre-feet per year, with the total expected water use of 54.4 acre-feet per year being well within GWF Energy's property water allocation. Because this water is not being used for cooling and no feasible alternative with a lower environmental impact is available, it is consistent with state water LORS (see the discussion in Section 5.15.4.3).
- **Surface Water:** The project area is relatively flat and there are no significant dams or levees in the vicinity. As described in Section 5.10.7, implementation of BMPs during construction and operation would avoid the potential for adverse impacts to surface water from the project.
- **Groundwater**: GWF Tracy will not make any direct use of groundwater resources and, therefore, would cause no adverse impacts to groundwater resources.
- **Stormwater**: Implementation of GWF Tracy will neither increase nor decrease runoff significantly on the project site. The onsite stormwater detention areas have been sized to adequately retain stormwater for gradual release into the storm drain system. The cumulative effects from stormwater runoff would not be significant.

5.15.7 Agencies and Agency Contacts

Involved agencies and agency contacts are listed in Table 5.15-4.

TABLE 5.15-4
Agency Contacts for Water Resources

Issue	Agency	Contact
To comply with NPDES permit requirements, a Notice of Intent must be filed prior to construction activities. A construction SWPPP also must be prepared.	SWRCB	State Water Resources Control Board Attn. Stormwater Section P.O. Box 1977 Sacramento, CA 95812-1977
To comply with NPDES permit requirements, a Notice of Intent must be filed prior to operational activities. An operational SWPPP also must be prepared.	SWRCB	State Water Resources Control Board Attn. Stormwater Section P.O. Box 1977 Sacramento, CA 95812-1977

5.15.8 Permits and Permit Schedule

Table 5.15-5 lists the permits required and permit schedule for water resources.

TABLE 5.15-5
Permits and Permit Schedule for Water Resources

Permit	Agency Contact	Schedule
Statewide General Permit for Construction Activities	State Water Resources Control Board Attn. Stormwater Section P.O. Box 1977 Sacramento, CA 95812-1977	One day to submit the Notice of Intent. SWPPP must be onsite prior to commencement of construction activities.
Statewide General Permit for Industrial Activities	State Water Resources Control Board Attn. Stormwater Section P.O. Box 1977 Sacramento, CA 95812-1977	One day to submit the Notice of Intent. SWPPP must be onsite prior to commencement of operational activities.

5.15.9 References

Western Regional Climatic Center (WRCC). 2001. Historical Climate Data Summary.

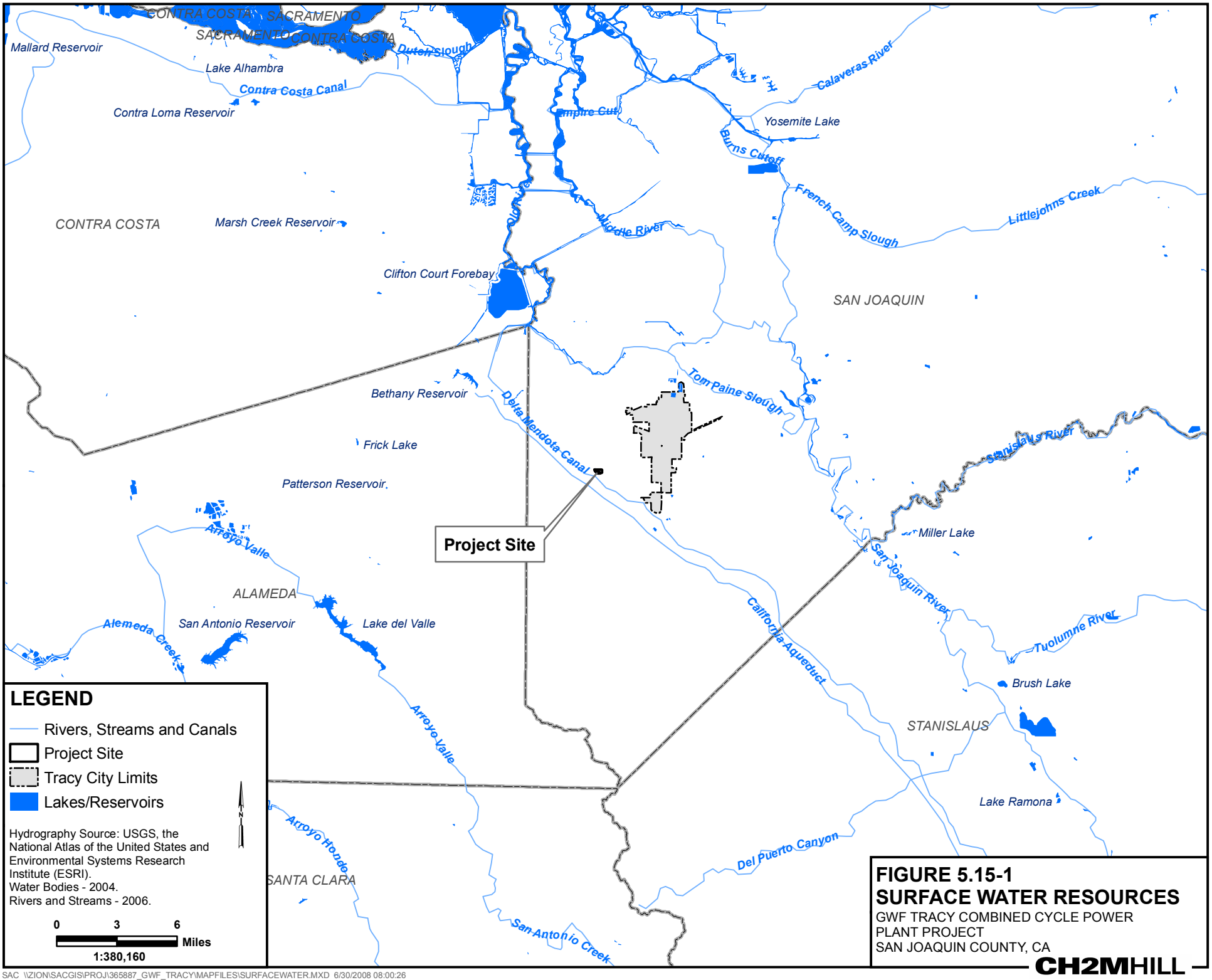

FIGURE 5.15-1
SURFACE WATER RESOURCES
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SAN JOAQUIN COUNTY, CA

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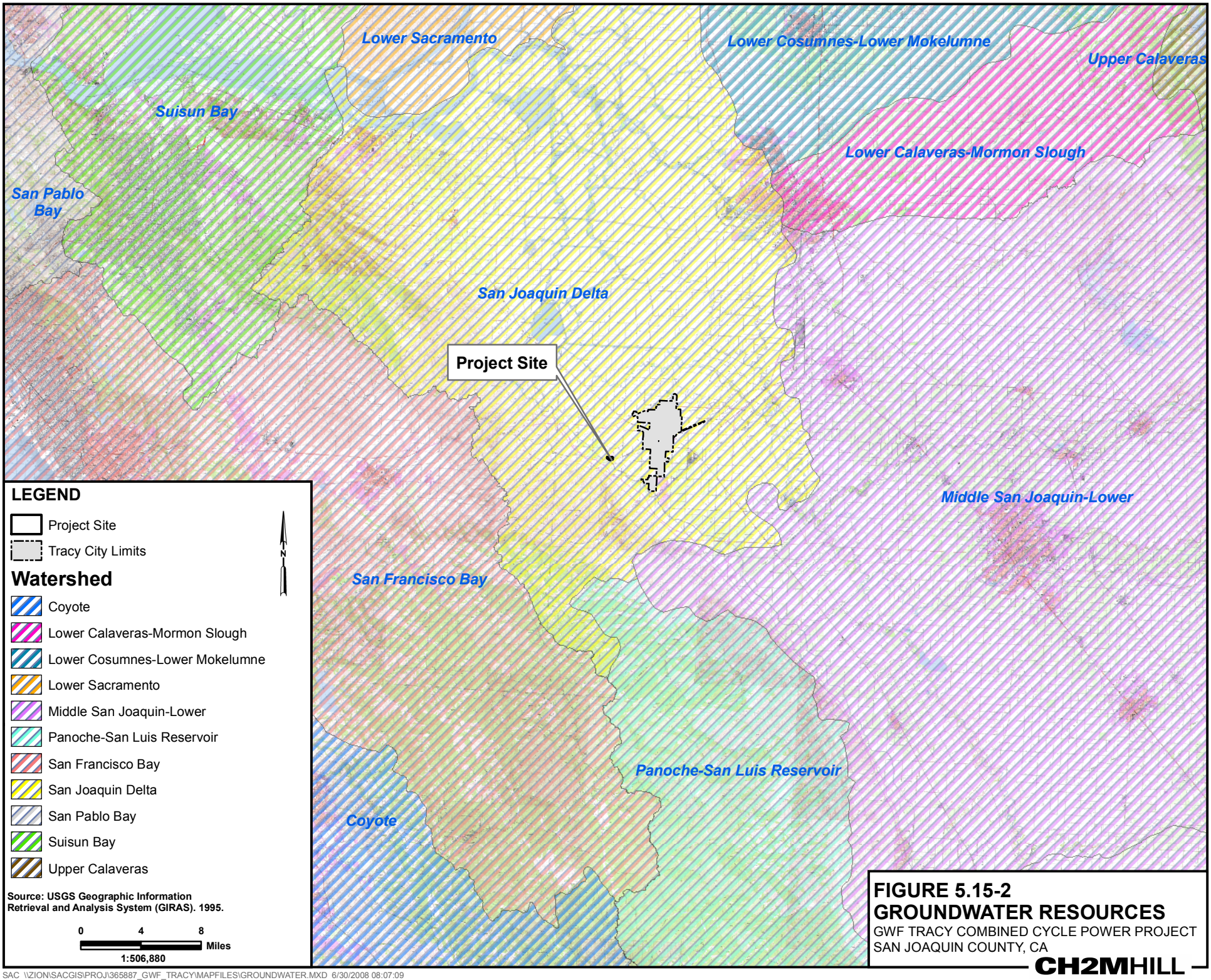

FIGURE 5.15-2
GROUNDWATER RESOURCES
GWF TRACY COMBINED CYCLE POWER PROJECT
SAN JOAQUIN COUNTY, CA

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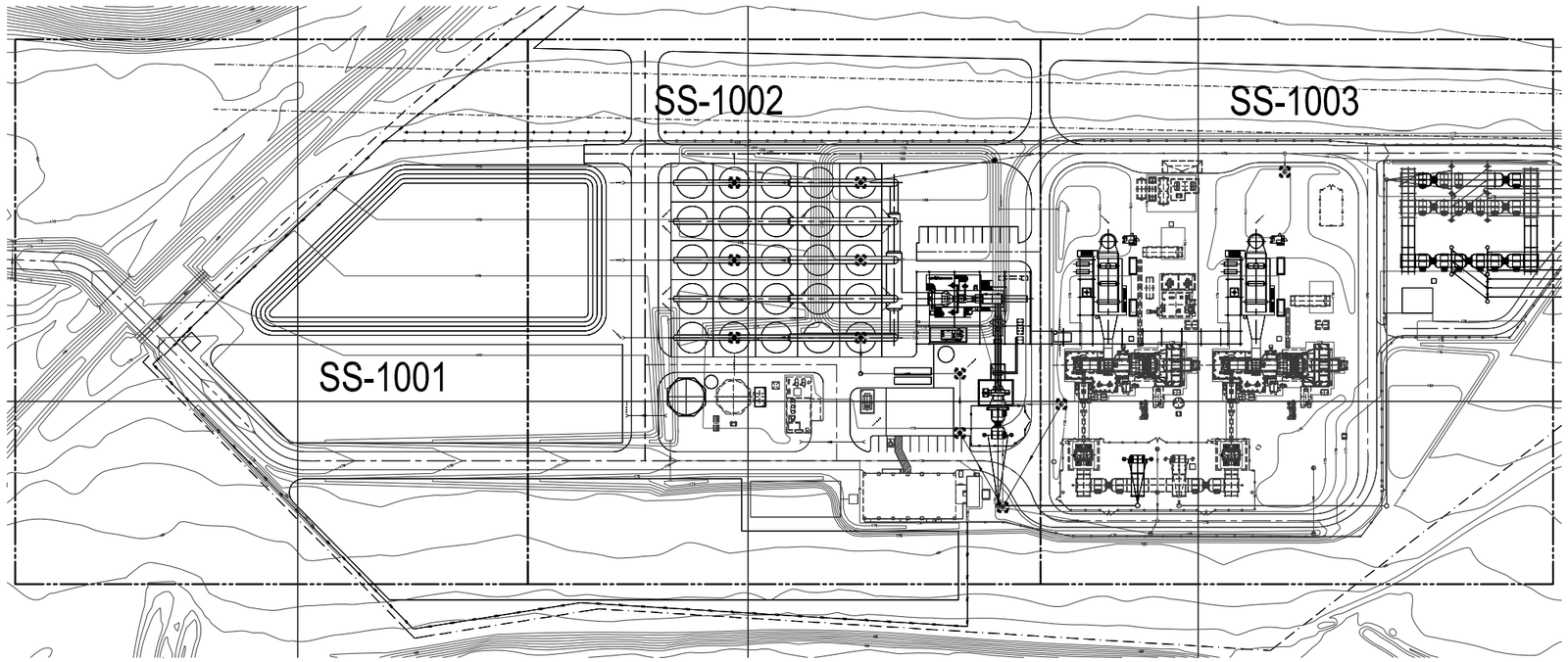

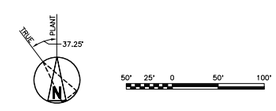

GENERAL NOTES

1. SEE DRAWING 160129-DM-M1001 FOR SITE ARRANGEMENT.
2. LOCATIONS OF EXISTING ROADS AND UTILITIES ARE SUBJECT TO FIELD VERIFICATION BY THE CONTRACTOR.
3. CONSTRUCTION SEQUENCE SHALL BE SCHEDULED TO MINIMIZE UNCONTROLLED RUNOFF AND OFFSITE SEDIMENTATION DURING GRADING OPERATIONS. SILT FENCE SHALL BE INSTALLED IN EACH AREA BEFORE GRADING OPERATIONS BEGIN.
6. NEW CONTOURS AND SPOT ELEVATIONS SHOWN ON THE DRAWINGS INDICATE FINISH GRADE, TOP OF SURFACING OR TOP OF ASPHALT, UNLESS NOTED OTHERWISE. SUBTRACT MATERIAL THICKNESS ACCORDINGLY WHERE TOP OF SUBGRADE ELEVATION IS REQUIRED.
7. ANY CONSTRUCTION ACTIVITIES THAT TAKE PLACE OUTSIDE THE LIMITS OF THE SILT FENCE AND HAVE THE POTENTIAL FOR ERODED SOIL TO BE WASHED AWAY FROM THE AREA SHALL BE ENTIRELY ENCLOSED BY SILT FENCE PRIOR TO THE START OF ANY SUCH ACTIVITIES.
8. GRADE SHALL SLOPE UNIFORMLY BETWEEN FINISH SPOT ELEVATIONS AND CONTOURS SHOWN ON THE PLAN.
9. A SMOOTH VERTICAL TRANSITION SHALL BE PROVIDED AT ROAD INTERSECTIONS.
10. ANY DISTURBED PORTIONS OF THE SITE WHERE CONSTRUCTION ACTIVITY TEMPORARILY CEASES FOR AT LEAST 21 DAYS SHALL BE TEMPORARILY MULCHED.
11. THE CONTRACTOR SHALL CONTROL DUST BY WATERING THROUGHOUT THE DURATION OF CONSTRUCTION.
12. SURFACE VEGETATION SHALL BE REMOVED COMPLETE WITH ROOTS TO A DEPTH OF NO LESS THAN 4 INCHES BELOW THE GROUND SURFACE.
13. THE TOP 12 INCHES OF EARTH SHALL BE REMOVED AND SHALL BE STOCKPILED ON SITE.
14. PRIOR TO FILLING, THE SUBGRADE SHALL BE SCARIFIED AND COMPACTED IN ACCORDANCE WITH THE CONSTRUCTION SPECIFICATIONS.
15. FILL MATERIAL SHALL BE PLACED TO THE FINISH ELEVATIONS INDICATED ON THE DRAWINGS.
16. ADEQUATE SHEETING AND BRACING SHALL BE PROVIDED TO PROTECT AND MAINTAIN THE STABILITY OF PREVIOUSLY CONSTRUCTED STRUCTURES AND THE SIDES OF EXCAVATION AND TRENCHES UNTIL THEY ARE BACKFILLED.
17. ADEQUATE DEWATERING EQUIPMENT SHALL BE PROVIDED TO REMOVE AND DISPOSE OF ALL SURFACE AND GROUND WATER ENTERING EXCAVATIONS AND OTHER PARTS OF THE WORK.
18. EXCAVATION, OVEREXCAVATION AND BACKFILL FOR INDIVIDUAL EQUIPMENT FOUNDATIONS SHALL BE TO THE DIMENSIONS AND ELEVATIONS BELOW THE CONCRETE FOOTINGS AS INDICATED ON THE DRAWINGS.

LEGEND

- NEW ASPHALT PAVEMENT
- EXISTING STRUCTURE
- NEW STRUCTURE
- SUBGRADE
- 10 — EXISTING CONTOUR
- 10 — NEW CONTOUR
- × 9.2 — EXISTING SPOT ELEVATION
- + 172.50 — NEW SPOT ELEVATION
- PROPERTY LINE
- MATCH LINE
- NEW FENCE
- TEMPORARY CHAIN LINK FENCE
- EXISTING FENCE
- SILT FENCE
- STRAW BALES
- STRAW BALE INLET SEDIMENT FILTER
- SURFACE DRAINAGE FLOW INDICATOR
- PERSONNEL GATE
- SWING GATE
- CB-01 — EXISTING CATCH BASIN
- CB-01 — NEW CATCH BASIN
- MH-01 — EXISTING MANHOLE
- MH-01 — NEW MANHOLE
- C-1 — EXISTING CULVERT
- C-1 — NEW CULVERT
- NEW DRAINAGE PIPING
- EXISTING DRAINAGE PIPING
- EXISTING POWER POLE
- EXISTING LIGHT POLE
- 1 / S3000 — SECTION OR DETAIL NUMBER / DRAWING DESIGNATION NUMBER
- N 9500.00 — NORTHING COORDINATE
- E 5000.00 — EASTING COORDINATE
- DEMOLITION/REMOVAL

ABBREVIATIONS

APPROX	– APPROXIMATE
ASPH	– ASPHALT
BM	– BENCH MARK
CB	– CATCH BASIN
CHDPE	– CORRUGATED HIGH DENSITY POLYETHYLENE
CCW	– COUNTERCLOCKWISE
CJ	– CONTRACTION JOINT
CL	– CENTER LINE
CONC	– CONCRETE
CW	– CLOCKWISE
DIA	– DIAMETER
DIP	– DUCTILE IRON PIPE
DWG	– DRAWING
EL	– ELEVATION
EJ	– EXPANSION JOINT
EXIST	– EXISTING
FF	– FINISHED FLOOR
HDPE	– HIGH DENSITY POLYETHYLENE
HP	– HIGH POINT
ID	– INSIDE DIAMETER
INV	– INVERT
MAX	– MAXIMUM
MIN	– MINIMUM
MSL	– MEAN SEA LEVEL
NO	– NUMBER
NTS	– NOT TO SCALE
PC	– POINT OF CURVATURE
PI	– POINT OF INTERSECTION
PL	– PROPERTY LINE
PT	– POINT OF TANGENCY
PVI	– POINT OF VERTICAL INTERSECTION
R	– RADIUS
RCP	– REINFORCED CONCRETE PIPE
REV	– REVISION
R/W	– RIGHT OF WAY
T/C	– TOP OF CURB
T/P	– TOP OF PAVEMENT
TOC	– TOP OF CONCRETE
T/GRATE	– TOP OF GRATE
TYP	– TYPICAL

FIGURE 5.15-3a
EXISTING AND PROPOSED GRADING AND DRAINAGE
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SAN JOAQUIN COUNTY, CA

Figure source: Black & Veatch Corp., 2007

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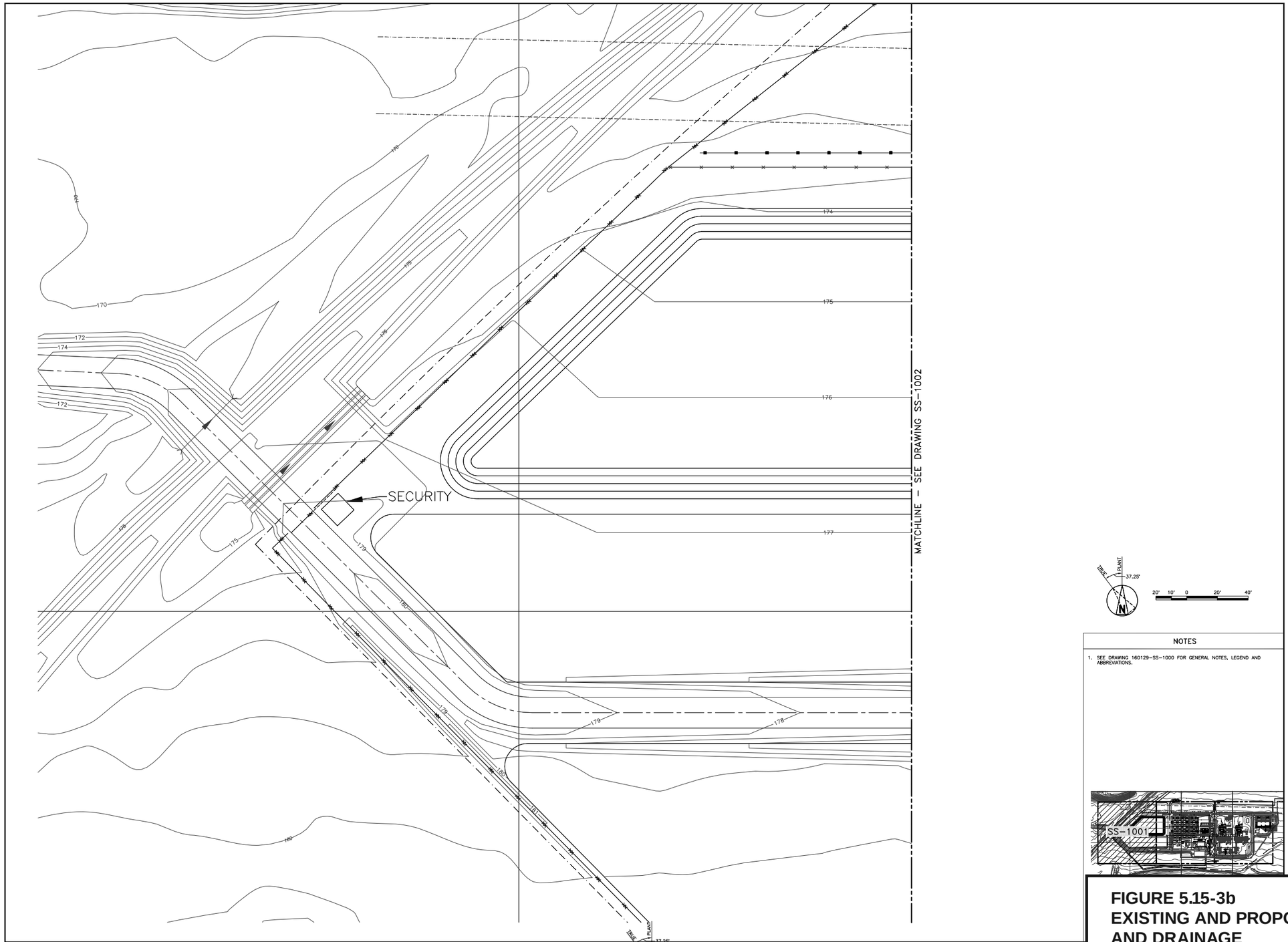

NOTES

1. SEE DRAWING 160129-SS-1000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

FIGURE 5.15-3b
EXISTING AND PROPOSED GRADING AND DRAINAGE
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SAN JOAQUIN COUNTY, CA

Figure source: Black & Veatch Corp., 2007

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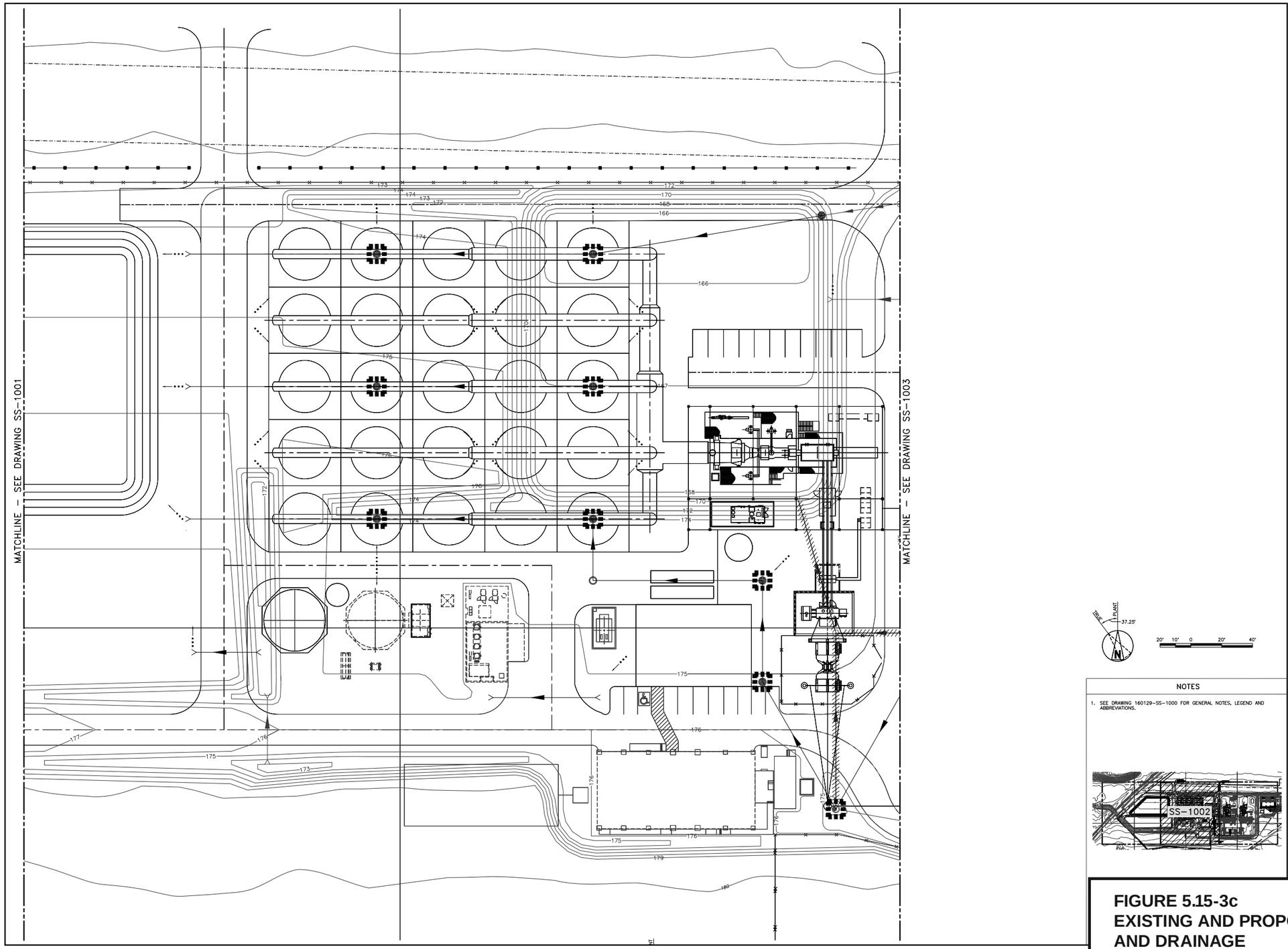

FIGURE 5.15-3c
EXISTING AND PROPOSED GRADING AND DRAINAGE
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SAN JOAQUIN COUNTY, CA

Figure source: Black & Veatch Corp., 2007

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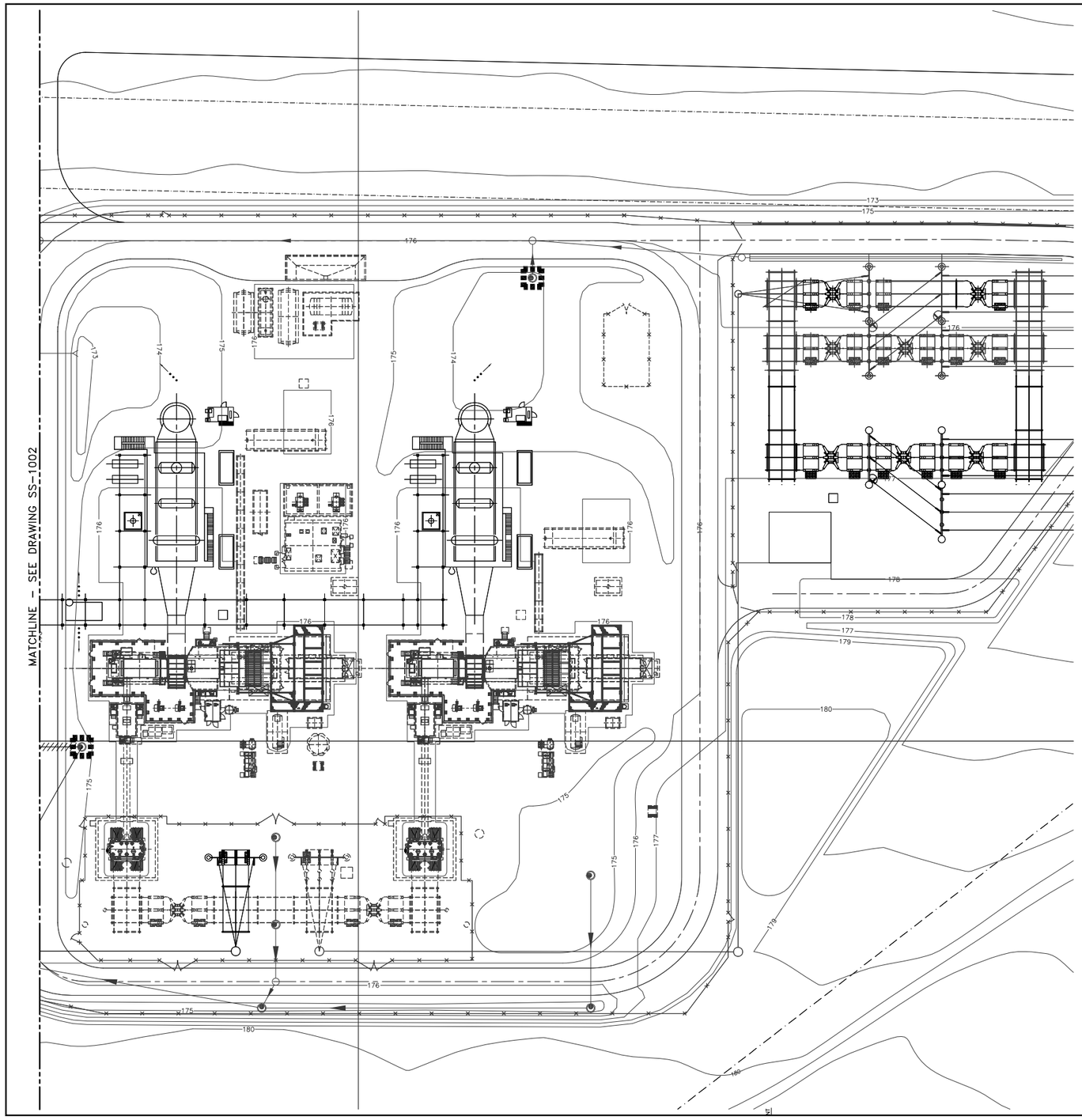

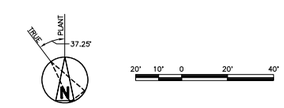

NOTES

1. SEE DRAWING 160129-SS-1000 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

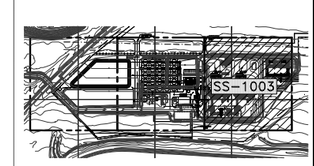

FIGURE 5.15-3d
EXISTING AND PROPOSED GRADING AND DRAINAGE
GWF TRACY COMBINED CYCLE POWER PLANT PROJECT
SAN JOAQUIN COUNTY, CA

Figure source: Black & Veatch Corp., 2007

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