Section 3 Project Description

3.1 PROJECT LOCATION

The proposed Gill Ranch Storage Field (Storage Field) will utilize depleted reservoirs in an existing gas field, the Gill Ranch Gas Field (Gas Field). The proposed Storage Field is located in central California's San Joaquin Valley, approximately 20 miles west of Fresno, and approximately 7 miles northeast of the city of Mendota. The Storage Field is located primarily in western Madera County, and a portion of the field spans the San Joaquin River into Fresno County. The town of Firebaugh is located approximately 11 miles northwest of the Storage Field, and the town of Kerman is located approximately 8 miles southeast. Figure 1.1-1 in Section 1, Executive Summary, and Figure 3.1-1 show the Project location in relation to nearby communities. Site photographs are provided at the end of this section and listed in Table 3.1-1.

An approximately 27-mile 30-inch diameter gas transmission pipeline will be constructed between Pacific Gas and Electric's (PG&E's) existing Line 401 near Interstate 5 (I-5) and the compressor site, which will be located near the center of the Storage Field reservoirs. Approximately 25 miles of pipeline will be located in Fresno County, and approximately 2 miles will be located in Madera County. The San Joaquin River forms the Fresno/Madera county boundary in this area. The pipeline will pass approximately 2 miles south of the town of Mendota. Figure 3.1-1 shows the proposed pipeline alignment. Several locations along the pipeline alignment are shown in Photos 1 through 16.

Land uses along the pipeline corridor are primarily agriculture or agricultural processing facilities. Other land uses along the pipeline corridor include the Mendota Wildlife Management Area (between pipeline Mileposts 17.5 and 18.3) and the Alkali Sink Ecological Reserve (between pipeline Mileposts 20 and 21.5). The pipeline would avoid construction in both of these areas.

The alignment will cross under several surface water features, including the California Aqueduct (pipeline Milepost 2.7), Fresno Slough (pipeline Milepost 18), and the San Joaquin River (pipeline Milepost 25). Agricultural ponds, canals, and irrigation ditches are also located at several locations on or near the alignment. One relatively large agricultural water feature the pipeline will cross under is the "Four-Mile" Slough (pipeline Milepost 22.4). Four-Mile Slough is located approximately 4 miles east of Fresno Slough and is an isolated remnant tributary to the Fresno Slough. Boring methods will be used to cross under these water features. The alignment parallels several roadways including Lincoln Avenue (a mostly unpaved private agricultural road from pipeline Milepost 0.0 to 10.2); State Route (SR) 33 (pipeline Milepost 10.2 to 15.3);West Panoche Road (pipeline Milepost 15.3 to 17); and SR 180 (West Whitesbridge Avenue; pipeline Milepost 17 to 22.6). Private agricultural roads will be followed between pipeline Milepost 22.6 and the central compressor station.

An estimated 30 surface owners will be involved in the gas transmission line right-of-way. Additional information on the pipeline alignment is provided in Section 3.5.

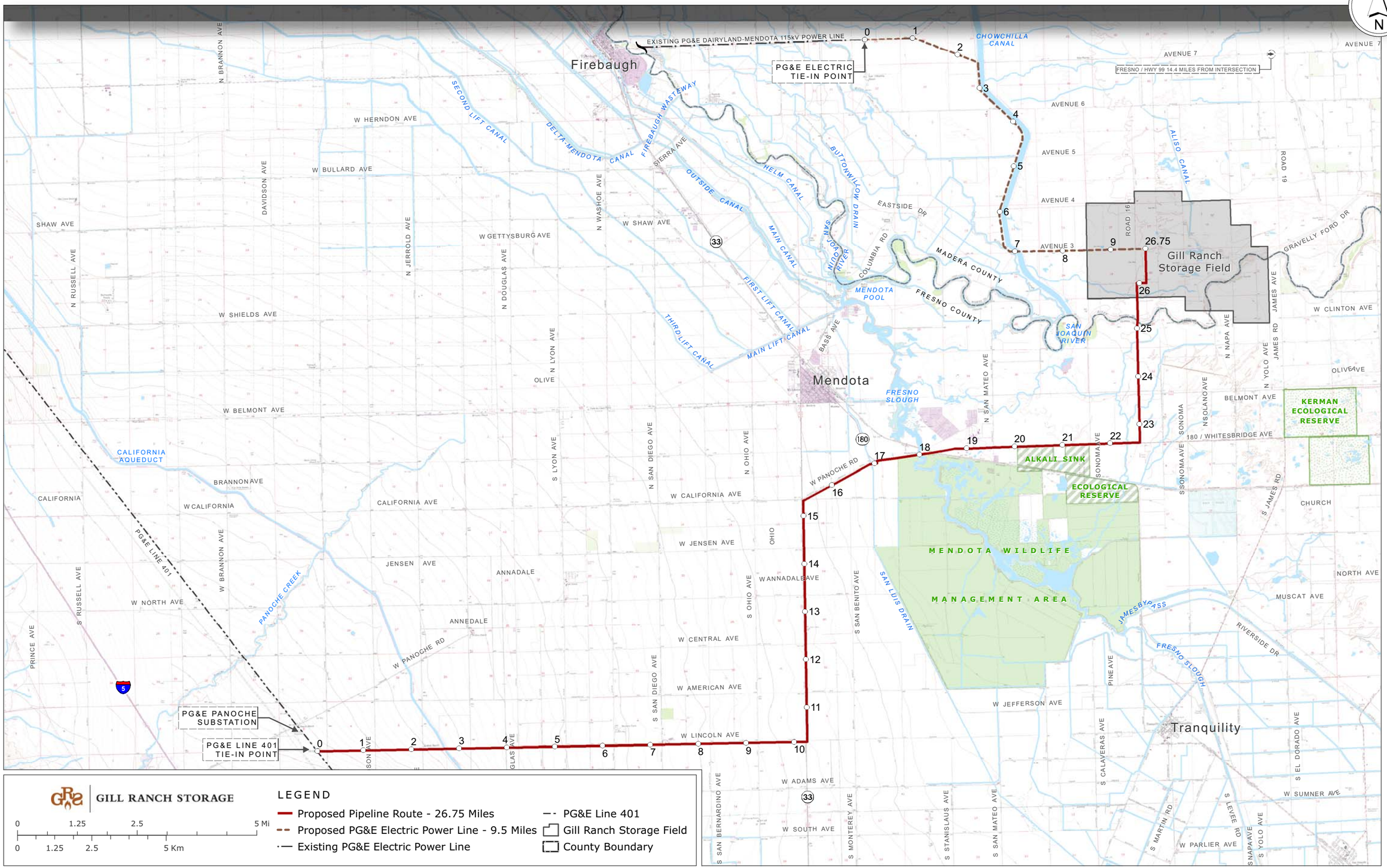
Properties within the proposed approximately 5,020-acres over the Storage Field are in active agricultural production (row crops, orchard and vineyard). Existing gas well pads and related facilities are located throughout the Storage Field. A prefabricated steel farm building was recently erected near the center of the Storage Field. The San Joaquin River passes through the southeastern portion of the Storage Field. There is one occupied residence in the Storage Field, located near the south bank of the San Joaquin River, in the southeastern portion of the Storage Field. Nine parcels would be involved in the Storage Field surface facilities.

The proposed 10-acre central compressor station will be centrally located in the Storage Field along Avenue 3, approximately 0.25 miles east of Road 16. The site is presently cultivated with irrigated row crops. Proposed and alternate locations for Injection/Withdrawal (IW) wells and Observation and Monitoring (OM) wells, including existing well pad sites and new sites, have been identified throughout the Storage Field. Figure 3.1-2 shows the boundary of the Storage Field, the proposed compressor station site, and the proposed and alternate well sites. Gas gathering and water handling lines are proposed to be located within or adjacent to the existing agricultural roads between the well pads and the central compression station. The compressor location, site access, and typical well pad locations are shown in Photos 17 through 24.

The total acreage for surface facilities within the Storage Field will be approximately 22 acres (including ten acres for the central compression facility, and approximately 12 acres for the well pads). Figure 3.1-2 shows the proposed Storage Field surface facility sites.

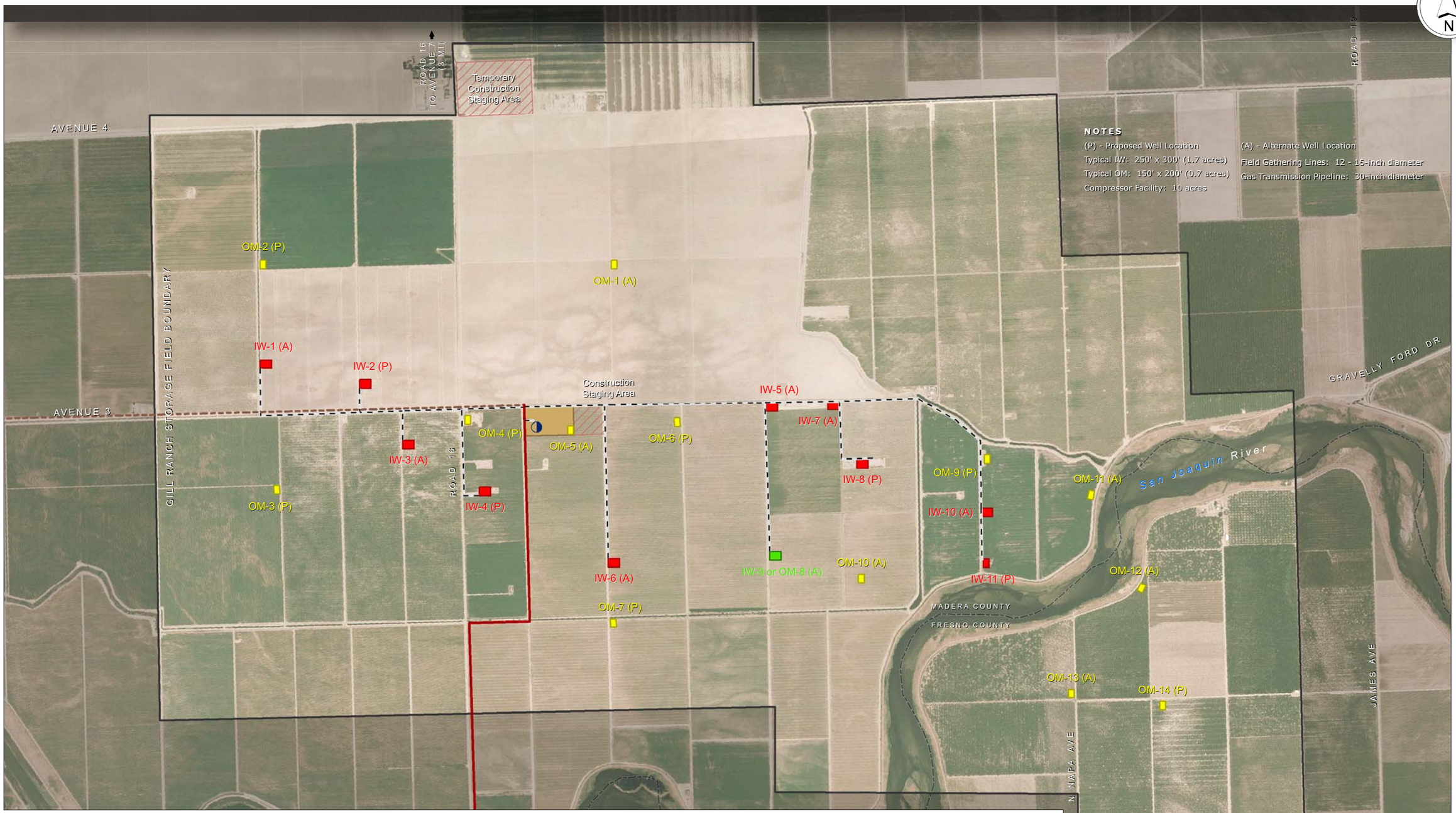
An approximately 9.75-mile electric power line will be constructed between PG&E's existing Dairyland-Mendota 115 kV power line on Avenue 7½ and the Storage Field central compressor station site. The power line route is shown on Figure 3.1-3. The power line will be entirely in Madera County. The proposed power line corridor will begin at a point on Avenue 7 ½ located approximately 5 miles east of the town of Firebaugh; run westerly along Avenue 7½ and Avenue 7; turn southerly along the Chowchilla Canal Road; then span the canal and continue easterly along Avenue 3 between the canal and the central compressor station. Several locations along power line corridor are shown in Photos 25 through 29.

The new power line will be located within established corridors that include PG&E facilities (electric distribution line corridors) and roadways. Approximately 1 mile of new power line will be constructed along county roads (Avenue 7) where there are currently no electric distribution facilities. Approximately 4.3 miles of the new power line along Chowchilla Canal Road would utilize existing electric distribution alignments by intersecting new 60 to 70 foot wood poles and removing the existing 40 to 50 foot wood poles. Along the north side of Avenue 3, approximately 2.2 miles of existing electric distribution line will be consolidated and transferred to the new power line along the south side of Avenue 3. There will be 2 steel poles on either side of the Chowchilla Canal.



ENTRIX
Environmental and Natural Resource Management Consultants

Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 3.1-1 | PROJECT OVERVIEW


N
NOTES
(P) - Proposed Well Location
Typical IW: 250' x 300' (1.7 acres)
Typical OM: 150' x 200' (0.7 acres)
Compressor Facility: 10 acres
(A) - Alternate Well Location
Field Gathering Lines: 12 - 16-inch diameter
Gas Transmission Pipeline: 30-inch diameter
ROAD 16 TO AVENUE 7 (3 MI)
Temporary Construction Staging Area
ROAD 15
AVENUE 4
AVENUE 3
GILL RANCH STORAGE FIELD BOUNDARY
ROAD 16
Construction Staging Area
GRAVELLY FORD DR
San Joaquin River
OM-1 (A)
OM-2 (P)
OM-3 (P)
OM-4 (P)
OM-5 (A)
OM-6 (P)
OM-7 (P)
OM-9 (P)
OM-10 (A)
OM-11 (A)
OM-12 (A)
OM-13 (A)
OM-14 (P)
IW-1 (A)
IW-2 (P)
IW-3 (A)
IW-4 (P)
IW-5 (A)
IW-6 (A)
IW-7 (A)
IW-8 (P)
IW-9 or OM-8 (A)
IW-10 (A)
IW-11 (P)
MADERA COUNTY
FRESNO COUNTY
N NAPA AVE
JAMES AVE
JAMES RD
CLINTON AVE
GILL RANCH STORAGE
0 0.25 0.5 1 Mi
0 0.25 0.5 1 Km
PROPOSED FACILITIES
Salt Water Disposal Well
Proposed Pipeline Route
Proposed PG&E Electric Power Line
Field Gathering Lines
Proposed (P) and Alternate (A) Injection/Withdrawl Well (IW)
Proposed (P) and Alternate (A) Observation/Monitoring Well (OM)
Injection/Withdrawl or Observation/Monitoring Well
Central Compressor Station
Construction Staging Areas

N

PG&E NEWHALL SUBSTATION

PG&E ELECTRIC TIE-IN POINT

EXISTING PG&E DAIRYLAND-MENDOTA 115kV POWER LINE

RIPPERDAN AVENUE / AVENUE 7 1/2

FIREBAUGH BOULEVARD

RIPPERDAN AVENUE / AVENUE 7

CHOWCHILLA CANAL ROAD

AVENUE 8

AVENUE 7 1/2

AVENUE 7

AVENUE 6

AVENUE 5

AVENUE 4

AVENUE 3

ROAD 16

ROAD 8 1/2

LONE WILLOW SLOUGH

RIDGE DITCH

CHOWCHILLA CANAL

ALISO CANAL

SAN JOAQUIN RIVER

HELM CANAL

MAIN CANAL

COLUMBIA CANAL

BUTTONWILLOW DRAIN

EASTSIDE DR.

0

1

2

3

4

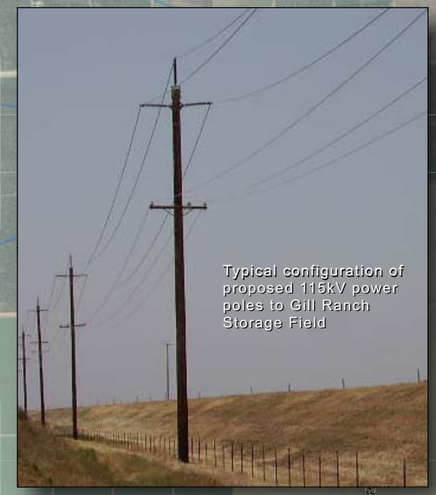
5

6

7

8

9



Typical configuration of proposed 115kV power poles to Gill Ranch Storage Field

SPAN OVER CHOWCHILLA CANAL

120' ENGINEERED POLE

120' ENGINEERED POLE

GILL RANCH STORAGE FIELD

CENTRAL COMPRESSOR STATION

GAS PIPELINE PROPOSED ROUTE

GILL RANCH STORAGE

0 0.25 0.5 1 Mi

0 0.25 0.5 1 Km

LEGEND

- New Poles
- Overbuild Existing Poles
- 120' Engineered Poles
- Proposed PG&E Electric Power Line
- Existing PG&E Electric Power Line
- Gill Ranch Storage Field

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Environmental and Natural Resource Management Consultants

Proponent's Environmental Assessment

GILL RANCH GAS STORAGE

FIGURE 3.1-3 | ELECTRICAL POWER LINE ROUTE

Table 3.1-1: Index of Site Photographs

Photo Number	Milepost / Project Site	Subject
1	Pipeline MP 0.0	Pipeline corridor looking east from proposed meter station at PG&E Line 401 tie-in point. Pipeline will be follow center of road in this area.
2	Pipeline MP 2.7	California Aqueduct, looking northwest from Horizontal Directional Drilling (HDD) crossing area near Lincoln Avenue.
3	Pipeline MP 9.0	Pipeline corridor looking west along Lincoln Avenue near intersection with Hwy 33.
4	Pipeline MP 17.0	Pipeline corridor looking west near intersection of Panoche Road and Hwy 180. Pipeline crosses under I-180 in this area.
5	Pipeline MP 17.5	Pipeline corridor looking east along I-180, between Panoche Road and Fresno Slough. Mendota Wildlife Management Area is located on south side of I-180 (out of picture).
6	Pipeline MP 18.0	Fresno / Kings Slough HDD crossing area, looking west from the east bank of the slough, north side of I-180 Whites Bridge / Kings Slough bridge # 42-21.
7	Pipeline MP 18.5	Pipeline corridor on north side of I-180 looking east from Fresno Sough area toward Spreckels Sugar Plant during winter rain conditions.
8	Pipeline MP 19.5	Meyer property looking east from intersection of Hwy 180 and San Mateo Avenue.
9	Pipeline MP 21.5	Frusetta property looking west from I-180 at the southeastern corner of the property.
10	Pipeline MP 22.4	Four-Mile Slough agricultural pond, looking north from Hwy 180.
11	Pipeline MP 22.6	Pipeline corridor looking west from I-180 shoulder at location where pipeline corridor turns north toward San Joaquin River.
12	Pipeline MP 25.1	San Joaquin River bed looking east from HDD crossing area.
13	Pipeline MP 25.1	HDD site and pipeline corridor in agricultural field south of San Joaquin River looking south toward Hwy 180
14	Pipeline MP 25.1	San Joaquin River looking west from south bank of river at HDD crossing site.
15	Pipeline MP 25.2	HDD site and pipeline corridor in agricultural field north of San Joaquin River looking north toward Storage Field
16	Pipeline MP 26.8	Central compressor site looking west from agricultural access road (Avenue 3) [use for simulation]
17	Compressor Station	Existing natural gas compressor station and natural gas production well site at intersection of Road 16 and Avenue 3 (approximately. 0.25 mile west of central compressor stations site).
18	Well pad	Typical proposed IW well pad at existing natural gas production well pad in Storage Field surrounded by row crops (Armstrong Petroleum Well Gill No. 62-21)
19	Well pad	Typical proposed IW well pad at existing natural gas production well pad in Storage Field surrounded by orchards.
20	Gathering Line	Typical agricultural road in Storage Field to be used for gathering lines between IW well pads and central compressor station.
21	Road 16 Access	Intersection of Road 16 and Avenue 7 looking northeast
22	Road 16 Access	View southeasterly from existing residences along Road 16 toward central compressor station site (1 mile distance) [use for simulation]
23	Road 16 Access	Existing residences on west side of Road 16, 1 mile north of central compressor site
24	Road 16 Access	Road 16 looking north near existing residences, 1 mile north of central

Table 3.1-1: Index of Site Photographs

Photo Number	Milepost / Project Site	Subject
		compressor site
25	Power line MP 0.0	Existing PG&E power line route on Avenue 7½ looking northwest to tie-in point at existing pole on north side of road. Power line would cross Ave 7 ½ at this location.
26	Power line MP 2.5	Power line route along north side of Avenue 7 near Chowchilla Canal. Power line will cross Avenue 7 in this area. Note typical PG&E line maintenance truck.
27	Power line MP 2.7	Power line route at Chowchilla Canal crossing looking south from Avenue 7.
28	Power line MP 7.0	Power line route at Chowchilla Canal crossing looking east across canal.
29	Power line MP 7.1	Power line route east of Chowchilla Canal, looking east along Avenue 3

PHOTO 1. PIPELINE MP 0.0. PIPELINE CORRIDOR LOOKING EAST FROM PROPOSED METER STATION AT PG&E LINE 401TIE-IN POINT. PIPELINE WILL BE FOLLOW CENTER OR ROAD IN THIS AREA.

PHOTO 2. PIPELINE MP 2.7. CALIFORNIA AQUEDUCT, LOOKING NORTHWEST FROM HDD CROSSING AREA NEAR LINCOLN AVENUE.

PHOTO 3. PIPELINE MP 9.0. PIPELINE CORRIDOR LOOKING WEST ALONG LINCOLN AVENUE NEAR INTERSECTION WITH HWY 33.

PHOTO 4. PIPELINE MP 17.0. PIPELINE CORRIDOR LOOKING WEST NEAR INTERSECTION OF PANOCHE ROAD AND HWY 180. PIPELINE CROSSES UNDER HWY 180 IN THIS AREA.

PHOTO 5. PIPELINE MP 17.5. PIPELINE CORRIDOR LOOKING EAST ALONG HWY 180, BETWEEN PANOCHE ROAD AND FRESNO SLOUGH. MENDOTA WILDLIFE MANAGEMENT AREA IS LOCATED ON SOUTH SIDE OF HWY 180 (OUT OF PICTURE).

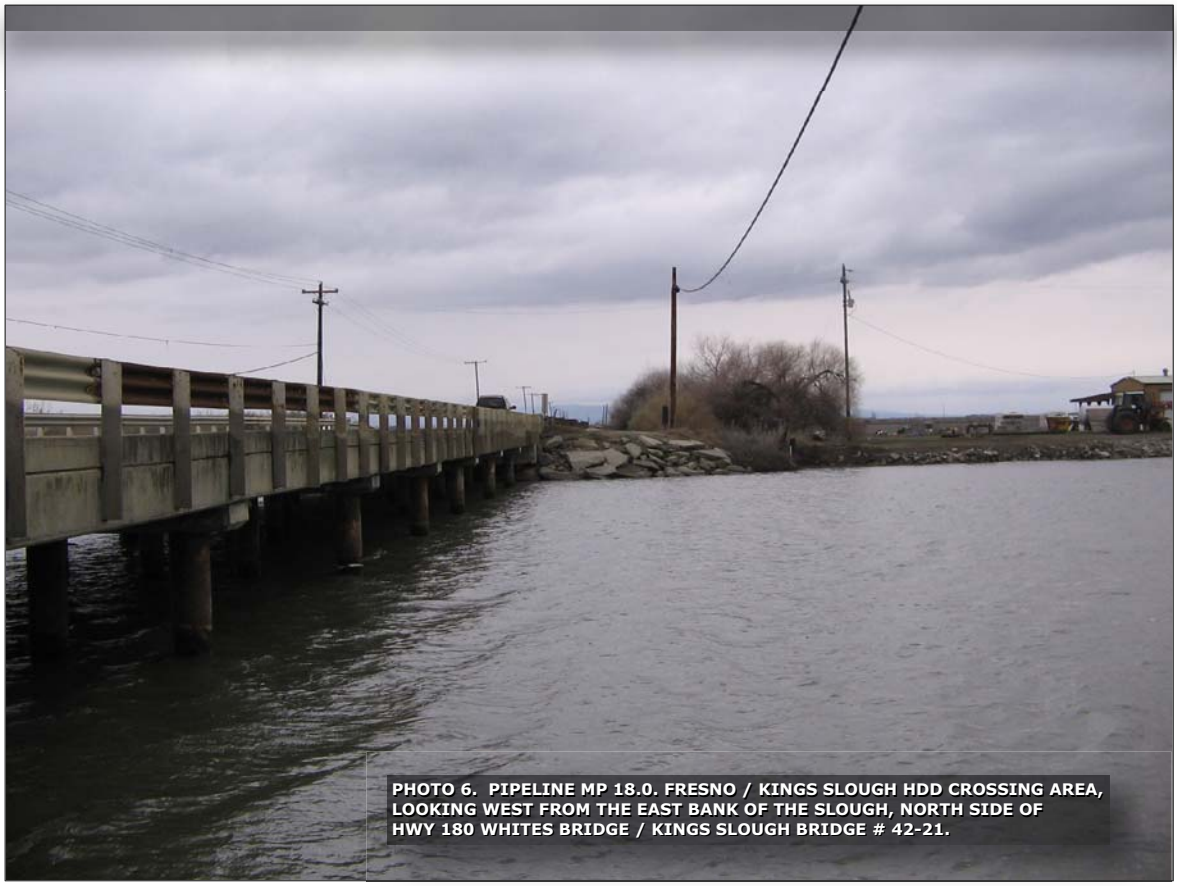


PHOTO 6. PIPELINE MP 18.0. FRESNO / KINGS SLOUGH HDD CROSSING AREA, LOOKING WEST FROM THE EAST BANK OF THE SLOUGH, NORTH SIDE OF HWY 180 WHITES BRIDGE / KINGS SLOUGH BRIDGE # 42-21.

PHOTO 7. PIPELINE MP 18.5. PIPELINE CORRIDOR ON NORTH SIDE OF HWY 180 LOOKING EAST FROM FRESNO SOUGH AREA TOWARD SPRECKLES SUGAR PLANT DURING WINTER RAIN CONDITIONS.

PHOTO 8. PIPELINE MP 19.5. MEYER PROPERTY LOOKING EAST FROM INTERSECTION OF HWY 180 AND SAN MATEO AVENUE.

PHOTO 9. PIPELINE MP 21.5. FRUSETTA PROPERTY LOOKING WEST FROM HWY 180 AT THE SOUTHEASTERN CORNER OF THE PROPERTY.

PHOTO 10. PIPELINE MP 22.4. FOUR-MILE SLOUGH AGRICULTURAL POND, LOOKING NORTH FROM HWY 180.

PHOTO 11. PIPELINE MP 22.6. PIPELINE CORRIDOR LOOKING WEST FROM HWY 180 SHOULDER AT LOCATION WHERE PIPELINE CORRIDOR TURNS NORTH TOWARD SAN JOAQUIN RIVER.

PHOTO 12. PIPELINE MP 25.1. SAN JOAQUIN RIVER BED LOOKING EAST FROM HDD CROSSING AREA.

PHOTO 13. PIPELINE MP 25.1. HDD SITE AND PIPELINE CORRIDOR IN AGRICULTURAL FIELD SOUTH OF SAN JOAQUIN RIVER LOOKING SOUTH TOWARD HWY 180

PHOTO 14. PIPELINE MP 25.1. SAN JOAQUIN RIVER LOOKING WEST FROM SOUTH BANK OF RIVER AT HDD CROSSING SITE.

PHOTO 15. PIPELINE MP 25.2. HDD SITE AND PIPELINE CORRIDOR IN AGRICULTURAL FIELD NORTH OF SAN JOAQUIN RIVER LOOKING NORTH TOWARD GILL RANCH

PHOTO 16. PIPELINE MP 26.8. CENTRAL COMPRESSOR SITE LOOKING WEST FROM AGRICULTURAL ACCESS ROAD (AVENUE 3)

PHOTO 17. EXISTING GAS COMPRESSOR STATION AND GAS PRODUCTION WELL SITE AT INTERSECTION OF ROAD 16 AND AVENUE 3 (APPROX. 0.25 MILE WEST OF CENTRAL COMPRESSOR STATIONS SITE).

PHOTO 18. TYPICAL PROPOSED IW WELLPAD AT EXISTING GAS PRODUCTION WELLPAD IN GILL RANCH SURROUNDED BY ROW CROPS (ARMSTRONG PETROLEUM WELL GILL NO. 62-21)

PHOTO 19. TYPICAL PROPOSED IW WELLPAD AT EXISTING GAS PRODUCTION WELLPAD IN GILL RANCH SURROUNDED BY ORCHARDS.

PHOTO 20. TYPICAL AGRICULTURAL ROAD IN GILL RANCH TO BE USED FOR GATHERING LINES BETWEEN IW WELL PADS AND CENTRAL COMPRESSOR STATION.

PHOTO 21. INTERSECTION OF ROAD 16 AND AVENUE 7 LOOKING NORTHEAST

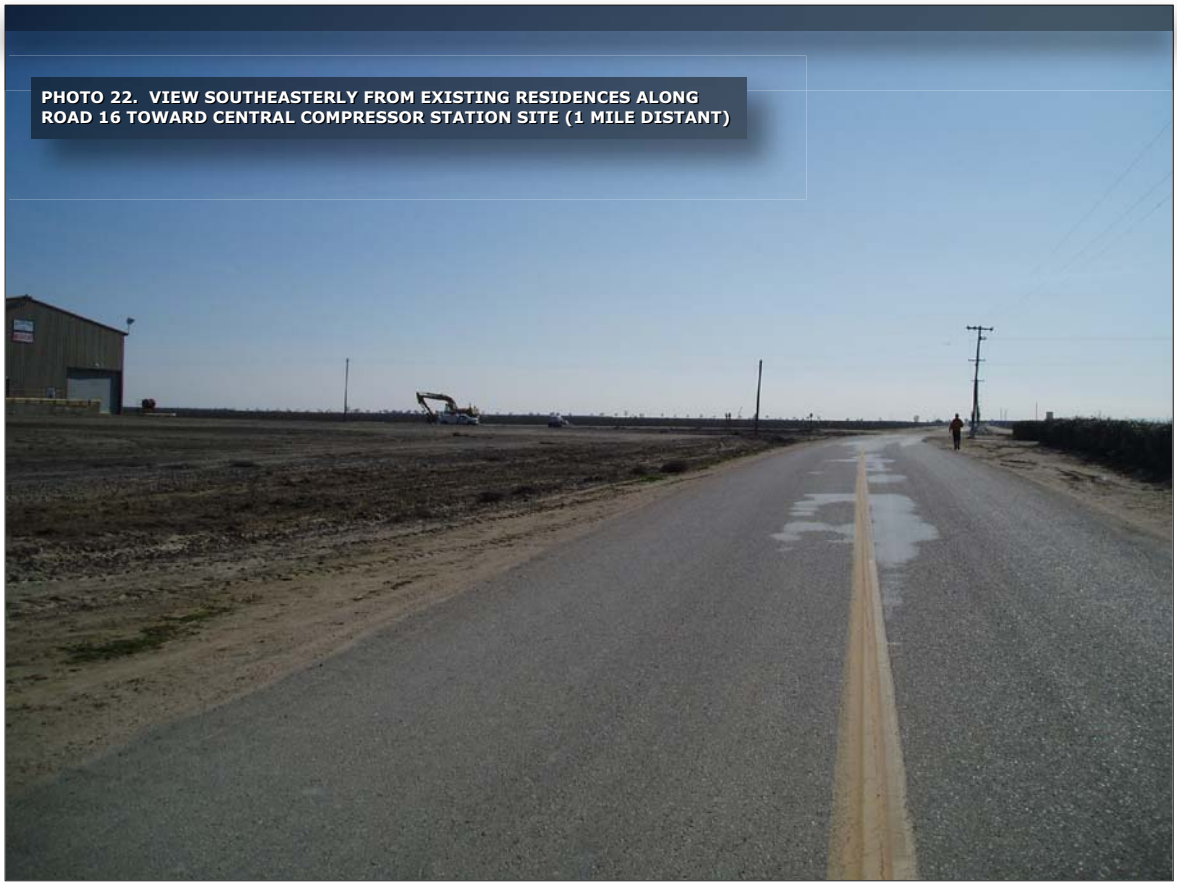


PHOTO 22. VIEW SOUTHEASTERLY FROM EXISTING RESIDENCES ALONG ROAD 16 TOWARD CENTRAL COMPRESSOR STATION SITE (1 MILE DISTANT)

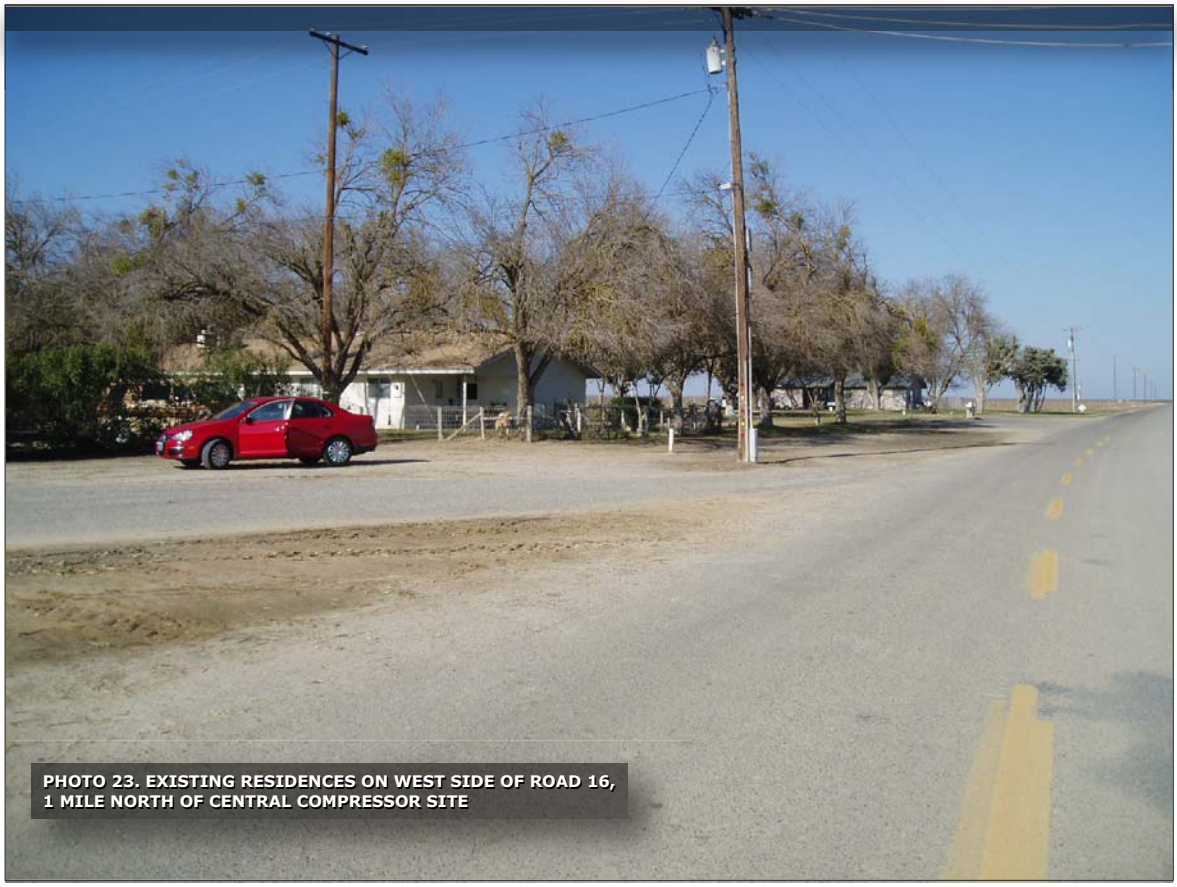


PHOTO 23. EXISTING RESIDENCES ON WEST SIDE OF ROAD 16, 1 MILE NORTH OF CENTRAL COMPRESSOR SITE

PHOTO 24. ROAD 16 LOOKING NORTH NEAR EXISTING RESIDENCES, 1 MILE NORTH OF CENTRAL COMPRESSOR SITE

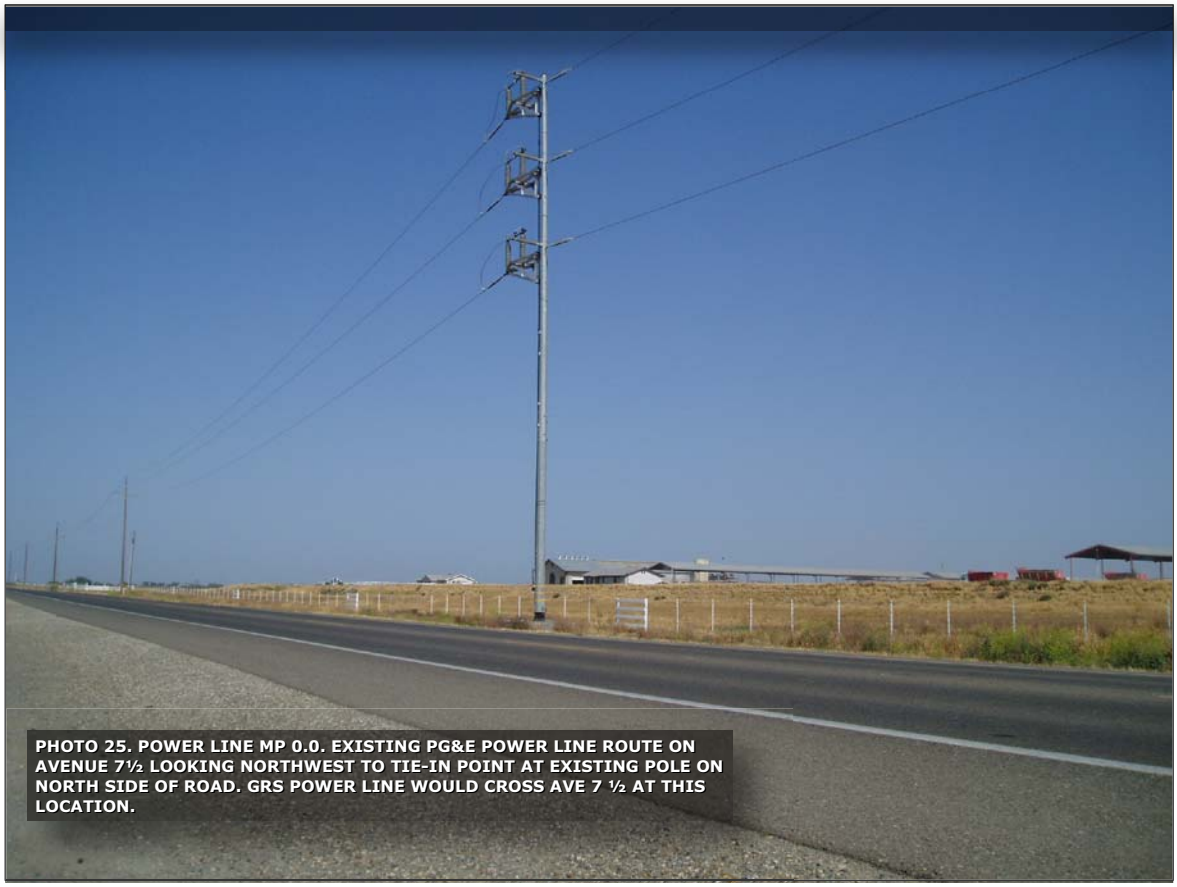


PHOTO 25. POWER LINE MP 0.0. EXISTING PG&E POWER LINE ROUTE ON AVENUE 7½ LOOKING NORTHWEST TO TIE-IN POINT AT EXISTING POLE ON NORTH SIDE OF ROAD. GRS POWER LINE WOULD CROSS AVE 7 ½ AT THIS LOCATION.

PHOTO 26. POWER LINE MP 2.5. POWER LINE ROUTE ALONG NORTH SIDE OF AVENUE 7 NEAR CHOWCHILLA CANAL. POWER LINE WILL CROSS AVENUE 7 IN THIS AREA. NOTE TYPICAL PG&E LINE MAINTENANCE TRUCK.

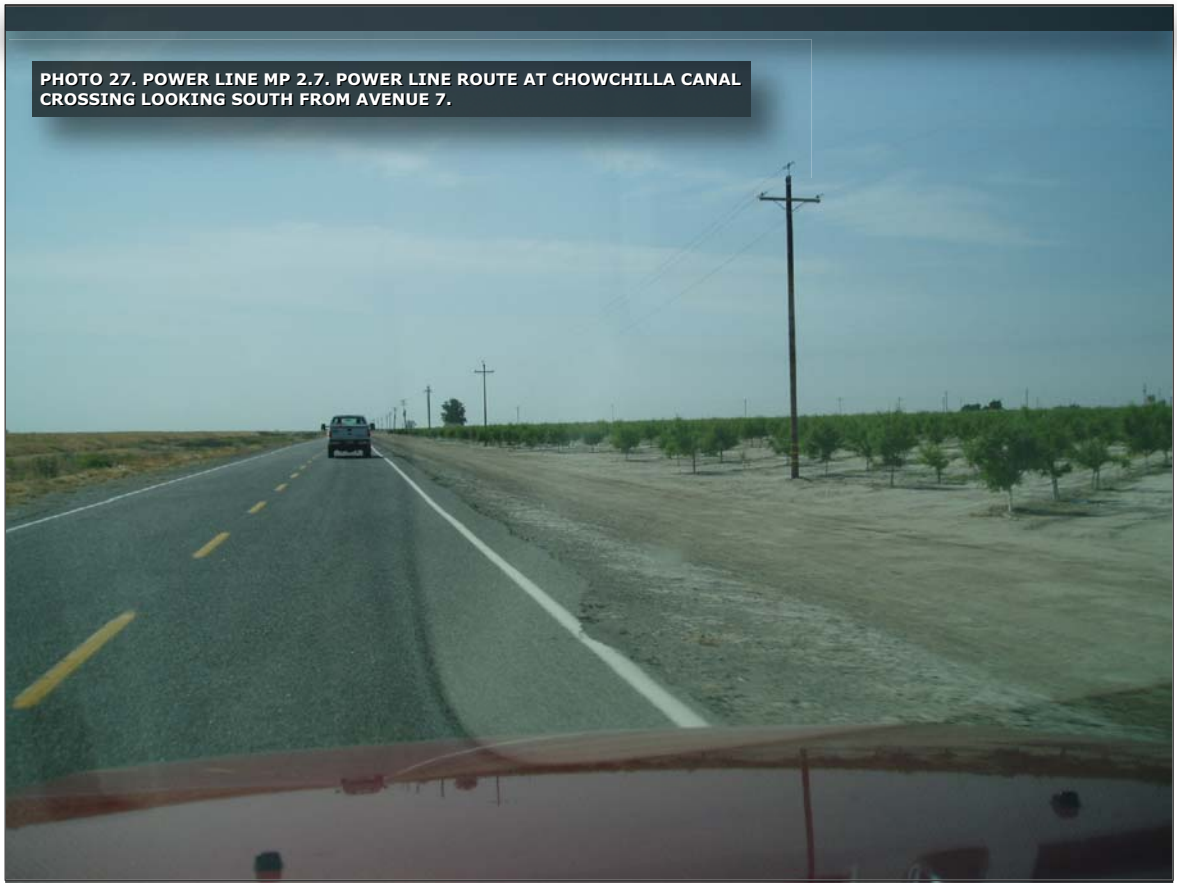


PHOTO 27. POWER LINE MP 2.7. POWER LINE ROUTE AT CHOWCHILLA CANAL CROSSING LOOKING SOUTH FROM AVENUE 7.

PHOTO 28. POWER LINE MP 7.0. POWER LINE ROUTE AT CHOWCHILLA CANAL CROSSING LOOKING EAST ACROSS CANAL.

PHOTO 29. POWER LINE MP 7.1. POWER LINE ROUTE EAST OF CHOWCHILLA CANAL, LOOKING EAST ALONG AVENUE 3.

3.2 EXISTING GAS AND ELECTRIC SYSTEMS

The proposed gas transmission pipeline will tie into PG&E's Line 401. Line 401 is a 36-inch diameter gas pipeline which is part of PG&E's backbone pipeline system, transporting gas to California markets. The PG&E Line 401 has a Maximum Allowable Operating Pressure (MAOP) of 1,040 Pounds per Square Inch Gauge (psig), and a typical operating pressure range of 550 to 1,000 psig.

PG&E's existing electric service within the vicinity of the Storage Field includes a 115 kV power line and various smaller distribution lines that collectively serve the area's agricultural, residential and commercial/industrial customers. The 115 kV line that will be interconnected to the central compressor station is located north and west of the Storage Field. This line runs primarily east-west along Avenue 7½ and north-south along San Diego Avenue, South of Firebaugh. The power line runs between the Mendota Substation located south of Firebaugh and southwest of Mendota and Newhall substations. This tie-in interconnection location was selected based on an evaluation of the Project's estimated load requirements; the ability of the existing PG&E distribution facilities to support a new service of this kind; existing line capacity; and distance to the compressor station. The existing and proposed electrical alignment is shown on Figure 3.1-3.

3.3 PROJECT OBJECTIVES

Project Objectives are addressed in Section 2, Purpose and Need.

3.4 PROJECT OVERVIEW

The proposed Project will utilize depleted reservoirs in an existing gas field, the Gill Ranch Gas Field (Gas Field), located in central California approximately 20 miles west of Fresno, near the town of Mendota. The Project is designed for 20 billion cubic feet (Bfc) of working gas and 650 million cubic feet per day (MMcfd) of peak deliverability.

The Project will consist of the underground reservoirs with new high deliverability injection/withdrawal (IW) wells, wellhead surface facilities, gathering pipelines from each well pad, a central compression and dehydration facility, an approximately 27 mile, 30-inch diameter pipeline to connect the field to PG&E's Line 401 west of the town of Mendota, and approximately 9.75 miles of electric power line. Each of these major components is summarized below and further detailed in Section 3.5. A generalized block flow diagram of the Project operations is shown in Figure 3.4-1.

Storage Reservoirs

The Gas Field was discovered in 1942 and production commenced in the following year from the Domengine/Kreyenhagen formations. Production from the Starkey Formation began in

1957 and ceased in 1996. Minor production in the field continues from two wells completed in the Kreyenhagen and Moreno formations.

The Field consists of several geologically separate reservoirs. The First and Second sands of the Starkey Formation lie at depths of 5,700 feet to 6,300 feet below ground surface and contain the depleted reservoirs to be developed for storage.

The shallower Domengine/Kreyenhagen and Moreno formations lie at a depth of about 4,300 feet to 4,600 feet and 5,570 feet below ground surface, respectively. These reservoirs would be the target for potential future development phases, depending on market conditions.

To achieve the design working gas capacity of 20 Bcf and the maximum design withdrawal rate of 650 MMcfd, up to 15 IW new wells will be drilled in three separate first and second Starkey reservoirs. The reservoirs will be operated in a pressure range of 500 to approximately 3,700 psig. In addition, up to seven new observation monitoring (OM) wells will be drilled into the storage formations, outside of the active working gas portion of the reservoir. One salt water disposal well will be constructed to properly dispose of water from the IW wells during withdrawal operations. A second disposal well may be necessary during early development. If the production rate of salt water exceeds the rate at which a disposal well will take waters from the IW wells, plus what can be stored in temporary surface tanks, then an additional well may be necessary. If the period of higher than normal water production is limited, then disposal of water at an approved offsite disposal site will be conducted in lieu of drilling a second well.

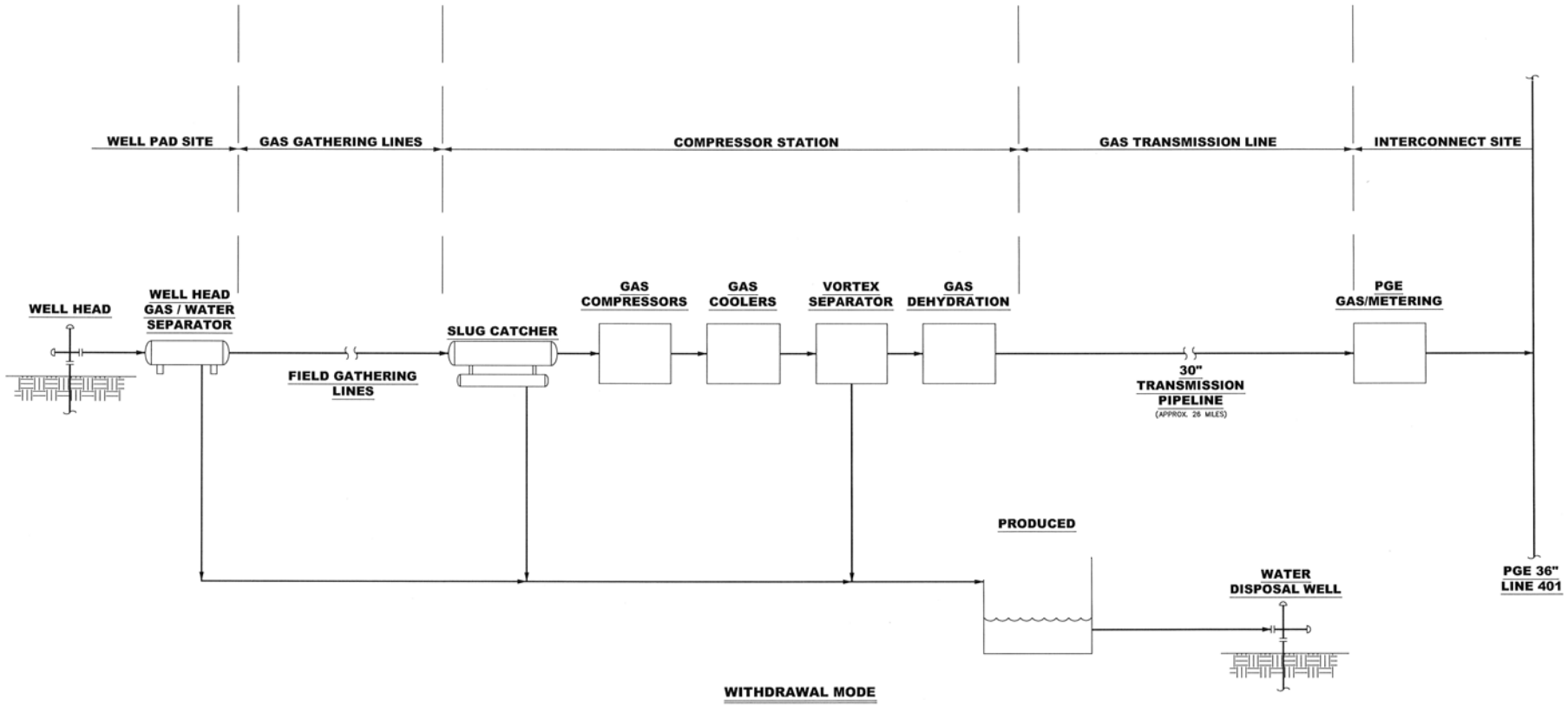
Wellhead Surface Facilities

The Storage Field consists of approximately 5,020 acres of primarily agricultural use lands, as shown on Figure 3.1-2.

The Storage Field lies generally along the northern bank of the San Joaquin River predominately in Madera County. A small portion of the Storage Field lies south of the river in Fresno County. One (1) OM well will be drilled south of the San Joaquin River. This well would be the only Project reservoir-related facility located in Fresno County.

Existing well sites previously developed for primary production will be used to the extent practical to minimize the surface impacts. Gathering lines will be constructed from the IW wells to the central compression facility.

In total, it is anticipated that there will be up to twelve surface sites, including: up to four IW well pads (potentially three existing sites and one new site), with multiple wells per pad; up to seven OM well pads, three of which could potentially utilize existing sites; and one well for the injection of salt water, located at the central compressor site.



Source: ForeRunner Corporation, 05/23/08, Drawing No. 12361-110B-001, Rev. P2

Central Compressor/Operating Facility

A single facility occupying approximately 10 acres near the center of the Project area will be required. This is the primary central operating facility for the Project and will consist of:

- Approximately 45,000 BHP of compression
- Gas Dehydration and Processing equipment
- Flow and Pressure Control equipment
- Custody Transfer Quality Metering
- Central Control Room
- Communication equipment
- Maintenance facility
- Salt Water Disposal Well
- Electric Substation

The central compressors will be driven by electric motors and designed to provide the reliability and operating flexibility necessary to meet the firm commitments of storage customers. Operating and maintenance personnel will be present at the Project during normal daytime workday hours. Operations personnel will be on call after hours and will electronically remain in communication with the control room.

Gas Transmission Pipeline

A 30-inch diameter gas transmission pipeline will be constructed from the outlet of the central compressor facility to an interconnect with the PG&E high-pressure backbone system (Line 401) near the I-5 corridor, approximately 27 miles west of the Storage Field. This pipeline will be designed and rated for and MAOP of 1,415 psig The pipeline will be operated to allow free flow into PG&E's system which has a normal operating pressure of 800 psig. The pipeline will be designed to allow for potential future additional deliverability without expansion of the pipeline capacity. An interconnect agreement and meter facilities will be required to tie into the PG&E transmission pipeline.

Electric Power Line

The proposed station compressors will be powered by electric motors. The motors will receive electricity from a new approximately 9.75-mile 115kV power line, which will be constructed, owned and operated by PG&E. The new power line will intersect within existing PG&E distribution lines where such lines exist. Approximately one mile of new power line will be constructed along existing roadways where there are currently no electric facilities. New (taller)

wood poles would be installed within existing distribution line alignments with the existing facilities underbuilt on the new power line. In those areas where electric distribution line consolidation can occur (Avenue 3), distribution facilities will be transferred to the new power line. There will be 2 steel poles, one on either side of the Chowchilla Canal. The new power line will tie in to PG&E's existing Dairyland-Mendota 115 kV power line at a point approximately 10 miles northwesterly of the central compressor facility, on Avenue 7½, approximately 5 miles east of Firebaugh.

A new electric substation will be located at the central compressor station. The substation will step down the voltage of the electricity to be used at the compressor facility for gas compression, dehydration, and other auxiliary uses at the station.

The proposed gas transmission meter station, to be located at the PG&E Line 401 tie-in point, will require an electric distribution service hookup to serve the gas meter. This facility will receive electricity from an existing 12kV electric distribution line located approximately 100 to 200 feet away from the proposed meter facility site.

3.5 PROJECT COMPONENTS

This section provides additional description and details of the major components described above.

3.5.1 Subsurface Reservoir Characteristics and Well Design

The Starky reservoirs to be developed for storage are located in two separate geological structures that occupy the west and east parts of the Storage Field. The westerly structure, which contains the Second Starky Reservoir, was created by a northwest trending, down to the east fault that offsets the south and southwest dipping Starky formation. The easterly structure, which contains both the First and Second Starky reservoirs, is a northwest trending, gently folded incline.

Figure 3.5-1 shows a schematic vertical profile view of a typical gas well design in relation to surrounding geologic formations. Figure 3.5-2 shows the Storage Field reservoirs on a scaled vertical profile; as shown in this figure, the target reservoirs are generally at depths of 5,700 feet to 6,300 feet below ground surface. The proposed salt water disposal well will return water from the wells during withdrawal operations to existing salt water aquifers at depths of approximately 3,200 to 3,500 feet below ground surface and more than 2,000 feet below the fresh water aquifers.

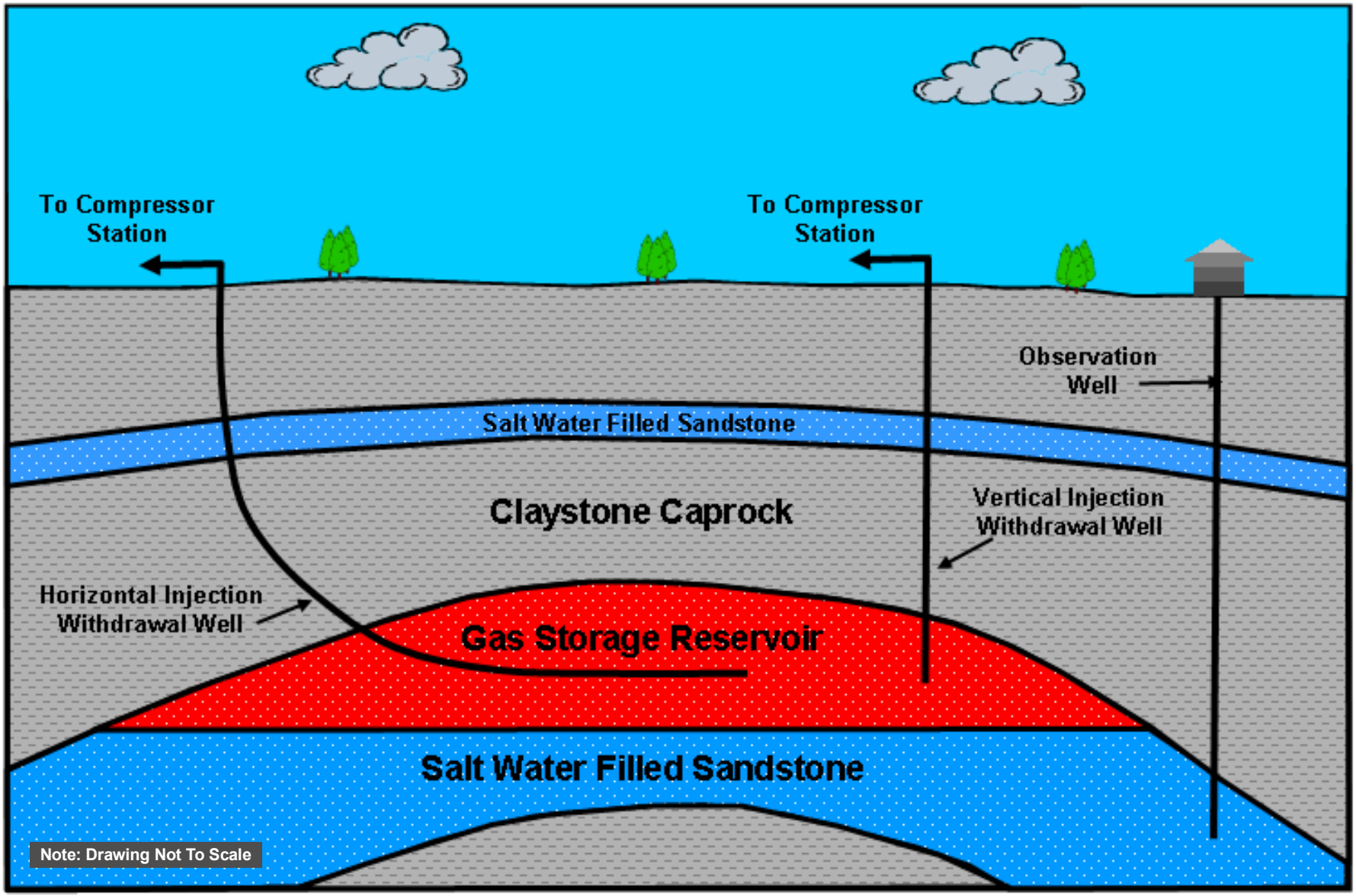


FIGURE 3.5-1 | CONCEPTUAL DIAGRAM OF AN UNDERGROUND NATURAL GAS STORAGE RESERVOIR

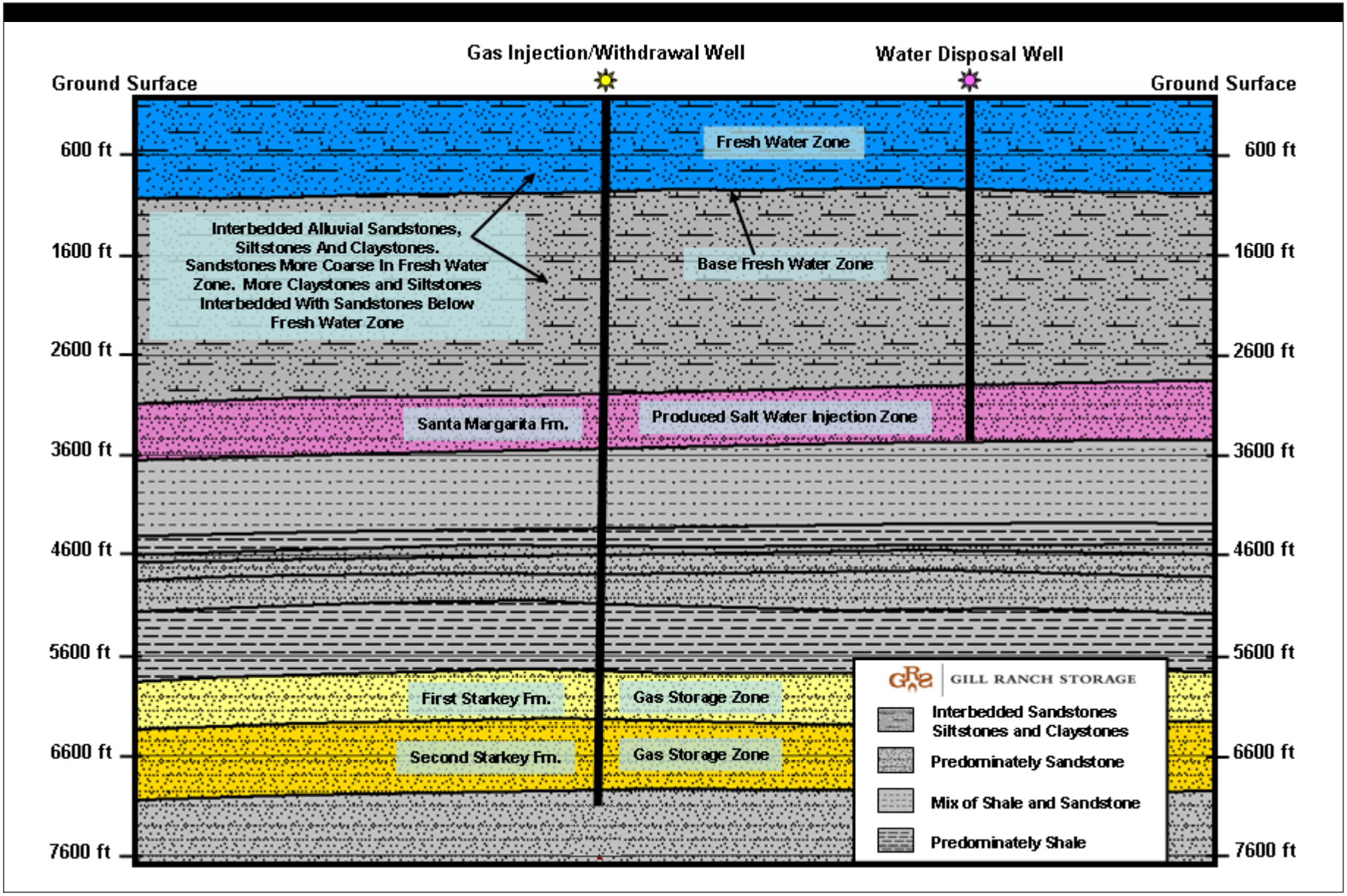


FIGURE 3.5-2 | DIAGRAMMATIC CROSS SECTION THROUGH INJECTION/WITHDRAWAL WELL AND WATER DISPOSAL WELL

Figure 3.5-3 shows a schematic view of typical well design methods used to protect groundwater aquifers from the injected production water and from injection of gas in an IW gas well. Several standardized practices will be employed by the Project to assure this protection of aquifers, consistent with California regulations. This protection typically consists of:

- Cement between the ground surface and outer steel casing;
- Outer steel casing;
- Drilling fluid with biocide and corrosion inhibitor between the outer steel casing and the inner steel casing from surface to base of outer casing. Inner steel casing is cemented from base of outer casing to the top of the storage zone; and
- Inner steel casing (annulus tubing), for production gas and fluids.

The specific steps required to drill the wells are described further in Section 3.7, Construction and in a preliminary Drilling Plan, provided in Appendix A.

3.5.2 Reservoir Injection / Withdrawal Wells and Connecting Flowlines

Up to 15 IW wells will be distributed over four well pad sites (potentially by expanding three existing sites and developing one new site). This section describes the location and design of the IW well pads and associated gathering lines.

Injection/Withdrawal Well pad Locations and Design

Figure 3.1-2 shows the location of the four proposed IW well pad sites, and seven alternate IW well pad sites. The proposed IW well pad sites were selected such that two IW pad sites will be located near the east side field development and two sites will be located near the west side field development. Anticipated well head pressures during operation range from 400 to 3,200 pounds per square inch atmosphere. At this time, reservoir engineering studies are underway. Pending completion of the reservoir studies, it is not yet known how the wells will be distributed between the four well pads except that the two east side IW pads will be used for First and Second Starkey wells, and the two west side IW pads will be used for Second Starkey wells. For the purpose of this PEA, the conceptual design for well pad equipment assumes an even distribution of capacity between wells in the East and West IW pads. Pending additional reservoir data, well pad equipment may be more concentrated at certain well pads than is shown in this PEA. However, the overall equipment requirements would not change.

Each IW well pad will measure 300 feet by 250 feet (approximately 1.7 acres). There are approximately 11 existing well pads throughout the Storage Field. The existing well pads vary in size and are typically less than one acre. Pending the review of additional reservoir data, it is anticipated that three of the new IW well sites will use existing well sites. The existing well pads will be expanded by approximately 1 to 1.5 acres each in order to accommodate the necessary drilling equipment and ongoing well operation and maintenance activities. Figure 3.5-4 shows a

typical IW well pad layout and the typical area of proposed expansion beyond the existing well pad.

Pending a final selection and sizing of new well sites, it is likely that one of the IW well pads will be located at a new site that is presently used for agriculture.

In summary, the IW well pads will occupy a total of approximately 6.8 acres on four equally sized 1.7-acre sites. Of this total, an estimated 2.4 acres will be co-located with previously established well pads, and the remaining estimated 4.4 acres will be in areas presently used for agriculture.

Agricultural operations surrounding the candidate IW well sites include row crops, vineyards and orchards. The proposed and alternate IW well pad sites that are under consideration are summarized in Table 3.5-1 (in general order from west to east) and shown on Figure 3.1-2. Each IW well pad site is adjacent to an existing farm access road. However, certain well pad sites could require extension of a short access way to provide entry into the well pad.

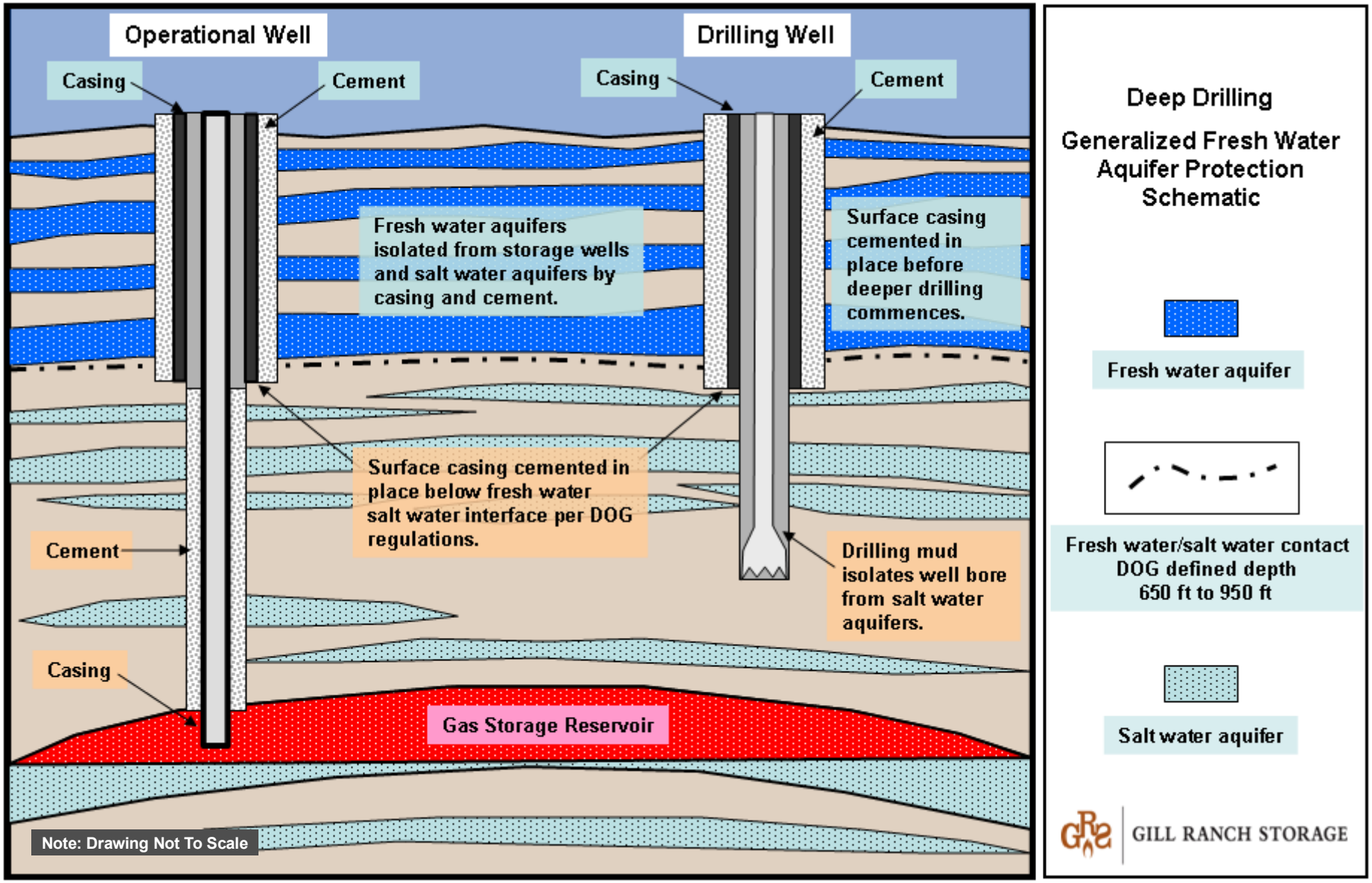


FIGURE 3.5-3 | GENERALIZED SCHEMATIC VIEW OF DEEP DRILLING FRESH WATER AQUIFER PROTECTION

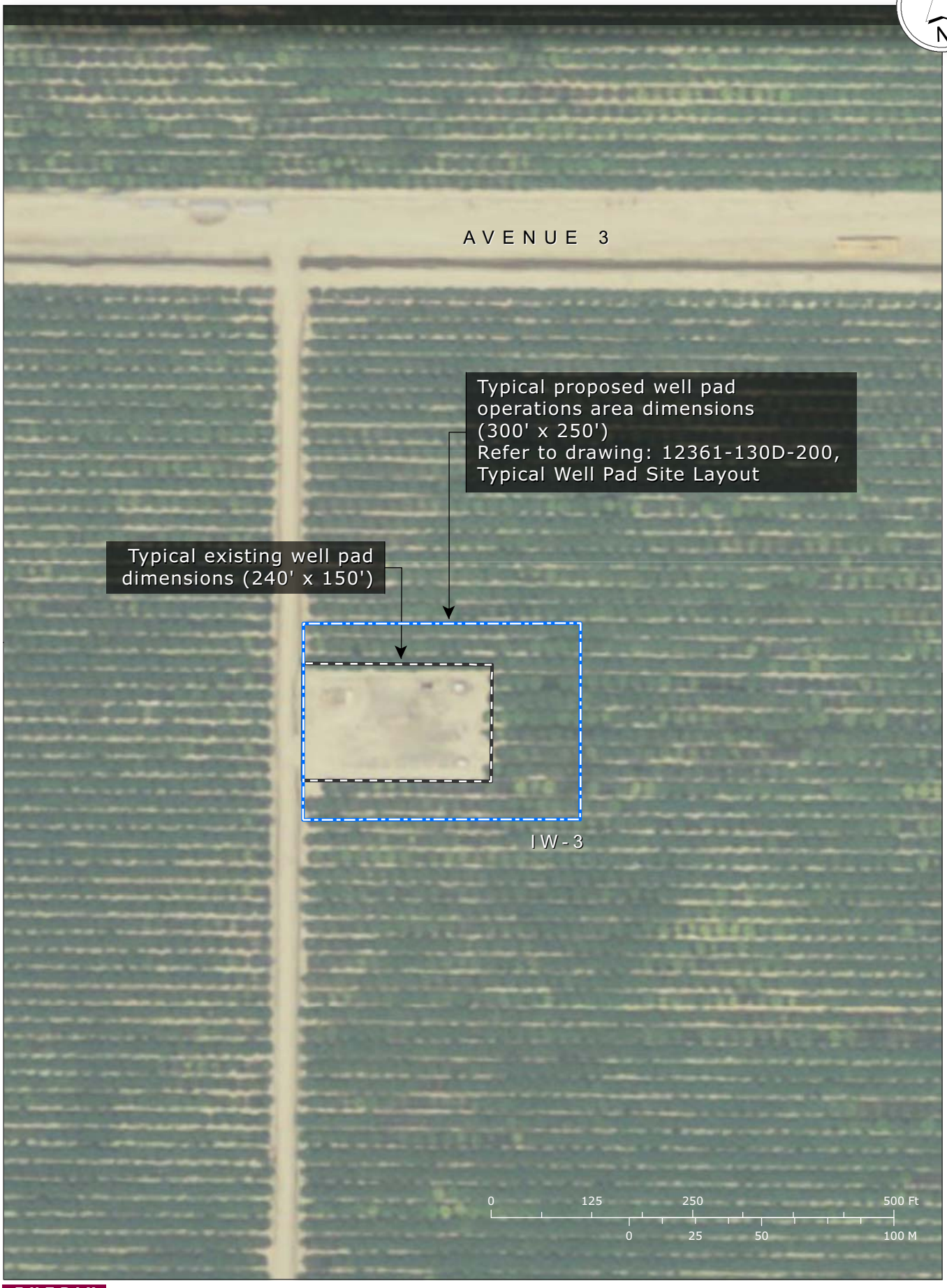

N
AVENUE 3
Typical proposed well pad operations area dimensions (300' x 250')
Refer to drawing: 12361-130D-200, Typical Well Pad Site Layout
Typical existing well pad dimensions (240' x 150')
IW-3
0
125
250
500 Ft
0
25
50
100 M

Table 3.5-1: Gill Ranch Proposed Surface Facility Locations and Existing Uses

Well Site Identifier (from west to east, refer to Figure 3.1-2)	Well Location and Surface Owner	Existing Uses
Proposed IW Well Sites		
IW 2	Madera Co. APN 040-155-03; California Valley Land; SE 1/4 SE 1/4 Sec 18 13S16E	Agriculture and north expansion of existing wellsite of abandoned Gill Ranch Deep A-3
IW 4	Madera Co. APN 040-213-06; Sullivan SW 1/4 NW 1/4 NW 1/4 Sec 21 13S16E	Agriculture and west and south and north expansion of existing well sites for idle Gill 12-20 and Gill Ranch Deep A-1
IW 8	Madera Co. APN 040-215-11; Sullivan NE 1/4 NW 1/4 Sec 21 13S16E	Expansion of existing well site for producing Gill 91-21
IW 10	Madera Co. APN 040-215-11; Sullivan S 1/2 NE 1/4 Sec 21 13S16E	Agriculture
Alternate IW Well Sites		
IW 1	Madera Co. APN 040-155-03; California Valley Land; SE 1/4 SW 1/4 Sec 18 13S16E	Agriculture
IW 3	NE 1/4 NE 1/4 Sec 19 13S16E	Agriculture and south expansion of existing wellsite of idle Gill Ranch Deep A-2
IW 5	Madera Co. APN 040-213-06; Sullivan NE 1/4 NE1/4 NE 1/4 Sec 20 13S16E	Agriculture
IW 6	Madera Co. 040-213-06; Sullivan NW 1/4 SE ¼ Sec 20 13S16E	Agriculture
IW 7	Madera Co. APN 040-215-11; Sullivan NW 1/4 NW 1/4 Sec 21 13S16E	Agriculture
IW 9	Madera Co. APN 040-215-11; Sullivan SW 1/4 NW 1/4 Sec 21 13S16E	Agriculture - same site as OM 8
IW 11	Madera Co. APN 040-215-11;Sullivan N 1/2 SE 1/4 Sec 21 13S16E	Agriculture - reclaimed well site for abandoned Gill Ranch 1-21
Proposed OM Well Sites		
OM 2	Madera Co. APN 040-154-02; Nilu Farms SE1/4 NW1/4 Sec 18 13S16E	Agriculture
OM3	Madera Co. APN 040-211-07; California Valley Land SE 1/4 NW ¼ Sec 19 13S16E	Agriculture
OM 4	Madera Co. APN 040-213-06; Sullivan NW 1/4 NW1/4 NW 1/4 Sec 20 13S16E	Existing well site for Gill 38X-17 and 18X-17
OM 6	Madera Co. APN 040-215-11; Sullivan NW 1/4 NE 1/4 Sec 20 13S16E	Agriculture - reclaimed site for abandoned well for Gill 61-20
OM 7	Madera Co. APN 040-215-11; Sullivan SW 1/4 SE 1/4 Sec 20 13S16E	Agriculture
OM 9	Madera Co. APN 040-215-11 NW 1/4 NE 1/4 Sec 21 13S16E	Agriculture - expansion of recently abandoned Gill 62-21
OM 14	Fresno Co. APN 015-070-28S; NE 1/4 NW 1/4 Sec 27 13S16E	Agriculture
Alternate OM Well Sites		
Central compressor station site	Madera Co. APN 040-213-06; Sullivan NE 1/4 NW 1/4 NW 1/4 Sec 20 13S16E	Agriculture
Water Injection Well 1	Madera Co. APN 040-213-06; Sullivan NE 1/4 NW 1/4 NW 1/4 Sec 20 13S16E	Agriculture (Central compressor station site)

Table 3.5-1: Gill Ranch Proposed Surface Facility Locations and Existing Uses

Well Site Identifier (from west to east, refer to Figure 3.1-2)	Well Location and Surface Owner	Existing Uses
OM 1	Madera Co. APN 040-155-03; California Valley Land NW1/4 SE1/4 Sec 17 13S16E	Agriculture
OM 5	Madera Co. APN 040-213-06; Sullivan NE 1/4 NW 1/4 NW 1/4 Sec 20 13S16E	Agriculture (Central compressor station site)
OM 8	Madera Co. APN 040-215-11; Sullivan SW 1/4 NW 1/4 Sec 21 13S16E	Agriculture same site as IW 9
OM 10	Madera Co. APN 040-215-11; NE 1/4 SW 1/4 Sec 21 13S16E	Agriculture reclaimed well site for abandoned Edison Securities B 1
OM 11	Madera Co. APN 040-215-11; SW 1/4 NW 1/4 Sec 22 13S16E	Agriculture reclaimed well site for abandoned Gill 13-22
OM 12	Fresno Co. APN 015-030-18; NW 1/4 SW 1/4 Sec 22 13S16E	Agriculture reclaimed well site for abandoned Edison Securities 25-22
OM 13	Fresno Co. APN 015-190-10S; SW 1/4 SW 1/4 Sec 22 13S16E	Agriculture
Other Storage Field Facilities		
Central compressor station	Madera Co. APN 040-213-06; Sullivan NE 1/4 NW 1/4 NW 1/4 Sec 20 13S16E	Agriculture
Salt Water Injection Well 1	Madera Co. APN 040-213-06; Sullivan NE 1/4 NW 1/4 NW 1/4 Sec 20 13S16E	Agriculture (Central compressor station site)

Injection/Withdrawal Well Pad Design and Layout

Once drilling is completed, the enlarged well pad areas will remain in place in order to accommodate ongoing well maintenance activity. The wellheads and associated piping and equipment will occupy approximately 0.3 acre, and this area will be surrounded by a gated chain link fence. Drawing 12361-130D-200 in Appendix A shows a typical well pad configuration and equipment layout. The design includes water separation, flow measurement, and emergency shutdown (ESD) for each well. Well head separators are a horizontal vane type design and are bi-directional so the flow configuration is the same during the injection and withdrawal operations. The separators will be designed and fabricated according to ASME Section VIII and registered with the national board. Water from each separator will be metered individually, collected in a common manifold, and flow to the central facility through a dedicated salt water handling pipeline system. The water manifolds and pipelines are conservatively sized at 4-inch diameter such that even if peak flows exceed the assumed production by double they will still be sufficiently sized.

A conservative conceptual design of the water handling facilities based on preliminary reservoir modeling and empirical water production information for similar reservoirs is assumed until such time as technical data regarding salt water is available. Salt water is produced during the early stages of operation and therefore a detailed water production study cannot be performed. As technical data regarding salt water is gathered from operation of the wells/reservoirs it is possible the configuration of the water handling facilities will need to be modified. Any such modifications will comply with applicable regulatory requirements.

Flow measurement for each well will be accomplished by an ultrasonic meter that is typically wet gas-tolerant, non-custody transfer flow meter used in natural gas production and underground storage applications. It is not anticipated that the gas flow metering would need to be custody transfer quality; therefore, the meter will simply be installed in piping in a configuration and length that mimics a meter tube. The flow meters will be located inside a pre-fabricated enclosure measuring 8 feet x 10 feet, for weather protection.

A local programmable logic controller (PLC) will be installed at each well pad and will provide pressure and flow information to control the injection of chemicals (methanol to inhibit hydrate formation and corrosion inhibitor) as operations warrant. The well emergency shut down (ESD) valves will be fail closed wellhead gate valves with pneumatic actuators. Site power requirements will be much less than a typical residential service and may be met with a solar powered system. If it is determined that solar power is not appropriate, power will be supplied from the Project electric substation or local PG&E distribution facilities.

Each IW well pad site will be equipped with pig launchers/receivers as well as separate chemical injection/control buildings. Pig launchers/receivers will be designed and constructed as piping and will allow pigging between the pads and the central compressor station. Each IW well pad will have a 12 feet by 12 feet chemical injection/control building which will be preassembled skidded packages, with weather-proof enclosures, to house the pad PLC panels as well as automated methanol and corrosion inhibitor injection equipment which will be needed during withdrawal operation.

Injection/Withdrawal Well Pad Gathering Lines

The 12-inch and 16-inch diameter high pressure gas gathering pipelines will be designed and constructed according to DOT 49 CFR 192 using an appropriate design factor. All gathering lines will have a 20 mil thick Fusion Bond Epoxy (FBE) coating. No water or major road crossings are required based on the well pad locations described above.

The preliminary gathering line locations are shown on Figure 3.1-2. The lines will follow existing farm roads between the well pads and the central compressor facility, and will be buried along their entire length except at the wellhead, and within the fenceline of the compressor station. Existing surface uses will not be affected by placement or operation of the gathering lines.

Water Gathering and Disposal Pipelines

The 4-inch diameter high pressure water pipelines will be designed and constructed according to DOT 49 CFR 192 standards. These lines will have a 20 mil thick FBE coating. No water or road crossings are anticipated based on the candidate well pad locations described above. The water gathering lines will be co-located with the gas gathering lines.

3.5.3 Observation Well Pad Locations and Design

OM wells allow operating personnel to verify the integrity of the Project storage reservoirs and monitor static reservoir pressure during active injection and withdrawal conditions. Up to seven OM wells will be constructed for the Project. Three wells could potentially use existing well sites, and the remaining four wells would likely use sites that are presently used for agriculture.

Observation Well Pad Locations

Figure 3.1-2 shows the seven proposed OM well sites and seven alternate well pad sites. A final selection of up to four new sites and three existing sites will be proposed when additional reservoir data is available.

Up to two OM well pads will likely be located on the northern and western perimeter of the target reservoir formations; two OM sites will likely be located near the eastern and southern perimeter of the reservoir formations; and three will be located between the west and east perimeter of the reservoir formations. The OM well pad sites are summarized in Table 3.5-1 above (in general order from west to east).

Each candidate OM well pad site is adjacent to an existing farm access road. Pending the review of additional reservoir data, it is anticipated that the four new OM well pads will be sited in areas that are presently used for agriculture. Agricultural operations at these sites include row crops, vineyards and orchards.

Observation Well Design and Layout

Each OM well pad will measure 150 feet by 200 feet (0.7 acre, less than half of the size of the IW well pads), for a total area of 4.8 acres. Each OM site will consist of pressure measurement and local data logging equipment enclosed in a 6 feet by 6 feet building. Site power requirements will be minimal and will likely be met with solar panels and low voltage batteries.

Piping for these pads will be limited to small diameter tubing for instrumentation; no offsite gas or water piping is needed. Telemetry may be handled either by hard line or by radio as determined from detailed design.

Site preparation will require removal of the existing agricultural operations (if any); grading and leveling the site; and placement of a gravel road base on the well pad and well pad access. When utilizing an existing well site, the site will be enlarged minimally to allow safe access during drilling and operational activities. If an existing site is not encumbered with other facilities, enlargement of the site will only be necessary to meet the drilling equipment layout requirements.

3.5.4 Central Compressor Station

Compressor Station Site and Surrounding Uses

The central compressor station will be centrally located on a 10-acre site within the Storage Field (Madera County Assessor Parcel Number [APN] 040-213-06). Site access will be via Avenue 7 (the primary east-west connector between Highway 99 to the east and Firebaugh to the west) and Road 16 (a north-south roadway approximately 17 miles west of Highway 99). From Avenue 7, the site is located approximately 4 miles south on Road 16, and then approximately 0.25 mile east on Avenue 3, an unpaved east-west farm road within the Storage Field. The compressor location information is summarized in Table 3.5-1 above.

Figure 3.1-2 shows the compressor station location relative to the proposed IW and OM well pads. The proposed site is in agricultural production and is surrounded by agricultural operations on all sides. A small gas compression facility is located west of the proposed site. This facility services two operating production wells in the Storage Field. Several existing well pads are located throughout the Project storage surface area. Agricultural buildings are located east of the proposed compressor site, along Avenue 3. The nearest residence to the compressor site is approximately 1 mile away.

The proposed compressor site was selected based on its central proximity to the existing and proposed well sites described above; proximity to existing site access; and remoteness from developed areas. With the exception of the surrounding agricultural operations, the site is remote from residential, commercial, and industrial developments and major roads. Section 5 Alternatives discusses potential alternatives to this site.

Preliminary Design Details

Preliminary design details for the compressor facility are provided in Appendix A. These materials include:

Table A-1 Preliminary Compressor Station Equipment List

Table A-2 Compressor Station Estimated Surface Area of Impervious Surfaces

Drawing 12361-130B-100 Site plan

Drawing 12361-130B-100 Gill Ranch Site Plan with Equipment Noise Measurements

Drawings 12361-130B-100B through 100E Elevation views

Drawing 12361-130B-100F Isometric view

Drawing 12361-160B-100 Architectural view of the Compressor building

Drawing 12361-160B-102 Compressor building elevation and section

The compression design includes five sweet gas compressor packages consisting of:

- One Toshiba 9000 bhp, 4160V induction motor operating at @ 720 rpm
- One Ariel KBV/ Six throw/1-2 stage natural gas compressor
- Stage 1: Three 11.750" V x 8.50" stroke cylinders rated at 1900psig
- Stage 1/2: Three 6.750" V-VS x 8.50" stroke cylinder rated at 4780psig.

Section 5, Alternatives, discusses other compressor designs and prime movers considered for the Project. As discussed further in Section 5, the selection of the compression design was based on an assessment of operation flexibility, capital cost, recurring operations costs, safety and environmental impacts, and reliability.

3.5.5 Central Water Separation, Dehydration, and Disposal

Gas will become water saturated during the storage period. During withdrawal, the gas will undergo secondary filtration and water separation before being dehydrated in order to meet PG&E gas quality requirements.

The initial design for primary separation of water during the gas withdrawal cycle uses a horizontal vane type separator on each well. The water flow from each separator is measured and combined with the other well streams and transported to the central compression station via a 4-inch diameter high pressure handling system.

Secondary separation will be achieved inside the compressor facility using slug catchers at the plant inlet from the field and downstream separators and filter/separators. Slug catchers, located outside of the plant ESD valves, will have approximately 250 barrel combined capacity and will be designed and constructed as piping according to DOT 49 CFR 192 using an appropriate design factor. A vortex separator will be located downstream of the slug catcher and upstream of the dehydration facilities. Horizontal filter/separators down stream of compressors will eliminate oil from the gas stream and will likely consist of a PECO[1] model PGCPH-59-394-602900 or equivalent design. Separators and filter/separators will be designed and fabricated according to American Society of Mechanical Engineers (ASME) Section VIII and registered with the national board. A preliminary general arrangement of these systems is shown on the facility site plan, Drawing 12361-130B-100 and in isometric view, Drawing 12361-1300-100F, in Appendix A.

The initial dehydration system design includes two 84-inch Tri-Ethylene Glycol (TEG) contactors equipped with structured packing. Process gas will flow through the contactors in parallel for the entire range of withdrawal operation. Each contactor will be equipped with a separate TEG regeneration skid including 3.34 Million British Thermal Units per hour

(MMBtu/hr) heater, 90 Mscfd striping gas column, 50 to 75 psi flash tank, and benzene to luene, ethylbenzene, xylene control unit. TEG pumps will be electric motor drive with variable frequency drive (VFD) control in order to achieve the needed capacity turn down.

Results from Glycalc simulations indicate that during much of the withdrawal cycle, one of the columns could be shut down without impacting the system performance. This allows for maximum system operational flexibility.

Estimated peak burner emissions for each regeneration skid are provided in Section 4.3, Air Quality.

The specific hardware selections and performance of the final dehydration system will be refined during detailed design and will likely change to some degree according to specific performance requirements developed and system modeling with an accurate gas analysis. Based on the current design information, the hardware description and performance defined above provides a conservative design for consideration of potential environmental and economic impacts. In particular, the initial design's estimated performance exceeds PG&E's requirement for water vapor, which reads as follows:

> "*The gas shall contain no more than seven pounds of water vapor per million standard cubic feet at 800 pounds per square inch gauge (psig) or less; dew point of 20° Fahrenheit (F) if gas is supplied at over 800 psig*".

Alternative secondary water separation equipment was considered. Two other design options were reviewed prior to the selection of the individual well separator concept. These options included water separation per well pad, and water separation at the central compression facility prior to filter separation.

Salt Water Disposal Well

The salt water disposal well will be located within the boundary of the compressor site. The preliminary location of the well is shown on the site plan in Appendix A, Drawing 12361-130B-100. Salt water will be injected into sandstones within the Santa Margarita Formation, which contains discrete sandstone units deposited by a marine delta, Miocene in age. Injection depth is anticipated to be between 3,200 feet and 2,500 feet below ground surface, which is approximately 2,200 feet to 3,500 feet below the base of the fresh water aquifer. The injection well will be permitted by the Division of Oil, Gas and Geothermal Resources (DOGGR).

There currently are two water injection wells in the Gas Field which also utilize sandstones in the Santa Margarita Formation. They are operated by the gas field operator and permitted by DOGGR. One well is located in section 20. It was permitted in 1994 and 637,250 barrels of salt water have been injected into it. Last injection occurred in March of 2006. The other well is

[1] Power, Ease-Of-Use, Compatibility, Overall Use

located in section 21. It was permitted in 1979 and 1,320,140 barrels of salt water have been injected into it. Last injection occurred in December 1998. Both wells are currently idle.

It is anticipated that only one injection well will be required to inject the salt water. If another well is required due to poor rock quality or higher volumes of salt water than expected, then another well will be permitted and drilled. The most likely location for this well will be on an OM well site or IW well site in section 22 in the east side of the Storage Field.

The first one to two years of operation will likely see the largest volumes of salt water, with an estimated volume of 300,000 barrels annually. The volume is expected to decline to 75,000 to 125,000 barrels annually after completing a number of dry gas injection cycles. The estimated water production rate after the entire operating gas volume is in place is 2,000 barrels per year per reservoir during peak times. Total Project-related salt water is estimated at 4,500 barrels of water per day during peak production. With the limited storage aquifer data available at this time, operations will be prepared to dispose of or store one and one-half times that volume per day. It is possible that the capacity of the first salt water disposal well will be exceeded during the Project's initial withdrawal operations (when water volumes are highest), and prior to constructing a second well. In this case, water disposal will be temporarily augmented by trucking the water to a certified disposal well or stored on site until disposal. A second well will be initiated if, based on actual water volume trends, the water volumes are anticipated to continue in excess of the capacity of the first well.

The disposal well will be designed and constructed in accordance with DOGGR regulations. As with the gas injection wells, the disposal design standards are intended to protect freshwater aquifers, as discussed above and shown in Figure 3.5-3.

Hazardous Materials Storage

Table 3.5-2 summarizes the typical fluid rates and quantities to be stored onsite at the compressor station. TEG is continuously regenerated so the monthly consumption and change interval are not applicable. The compressor lube oil rates and quantities are based on Ariel compressor standards for the five large EMD reciprocating compressor packages. Each compressor contains 212-gallons and has a 50-gallon daily feed tank. A 1,000-gallon tank is used to supply lube oil to each of the 50-gallon daily feed tanks. The corrosion inhibitor and methanol injection rates are based on typical rates of 0.5 pint per million standard cubic feet (MMSCF) of corrosion inhibitor and 0.75 gallon per MMSCF of methanol respectively. The quantity stored on site and change interval was chosen based on typical tank sizes. Used compressor lube oil is stored in 5-300-gallon tanks for storage until it is shipped offsite for disposal. Oily water (mixture of salt water and oil) is stored in a 21,000-gallon tank until it is shipped offsite for disposal. Each transformer for the electrical substation contains 4,000-gallons of non-PCB transformer oil for a total of 8,000-gallons. The transformers are sealed and no replacement of transformed oil is needed under normal operating conditions.

Table 3.5-2: Onsite Fluid Storage and Change-Out Intervals

Material	Quantity on site	Rate	Change Interval	Monthly Consumption
Tri-Ethylene Glycol (TEG)	90 Barrel makeup tank	100 GPM	N/A	Regenerated
Compressor Lube Oil	1,000 Gallon tank	30.65 GPD	Every 2-4 weeks	920 Gallons
Corrosion Inhibitor	600 Gallons	19.5 GPD	Monthly	587.5 Gallons
Methanol	6,000 Gallons	203.5 GPD	Every 3-4 Weeks	6,105 Gallons
Used Lube Oil	1,500 Gallon (5-300-gallon tanks)	N/A	Every 3-6 Months[1]	Shipped offsite for Disposal
Oily Water (95% water, 5% oil)	21,000 Gallons	N/A	Monthly[1]	Shipped Offsite for Disposal
Transformer Oil	8,000 Gallons (contained in 2- 4,000 gallon sealed transformers)	N/A	N/A	N/A

[1] Sent for Offsite Disposal

GPM = Gallons per day; GPM = Gallons per minute.

3.5.6 PG&E Interconnection and Meter Facility

Gas to be injected into the Project reservoirs will be delivered from PG&E's backbone pipeline, Line 401, at a point of connection located approximately 0.5 mile southeast of PG&E's Panoche electric substation. This interconnect site will also serve as the delivery point for gas withdrawn from the Storage Field.

Historical operations data shows that line pressures at this interconnect range from 550 to 1,000 psig. This pressure is critical to the design of the storage facility because of its impact on peak compression HP required during the injection cycle. Based on PG&E's historical data, the design pressure of 650 psig has been selected.

Tap and meter facilities at this interconnect location will be designed, provided by and installed by PG&E according to its standard practice. The site itself would be prepared by GRS including grading, construction of access roads, and security fencing. The facility will be approximately 0.25 acre, and will include a pig launcher/receiver and PLC controls that will interface with PG&E's system for local data logging and transmission of telemetry to the central control facility.

This site is described further in the pipeline discussion, Section 3.5.10. Table A-3 in Appendix A provides a list of equipment to be installed at the tap and meter facility. Drawing 12361-130F-100 in Appendix A provides a typical tap and meter configuration.

3.5.7 Plant Metering

Primary gas metering at the central compressor facility will be custody transfer quality and will consist of ultrasonic flow measurement, chromatograph gas quality measurement and moisture detection. The gas flow meter design concept includes a Daniel® SeniorSonic™ Gas Flow Meter,

4-path, with 16-inch meter tube. The meter tube will be approximately 72 feet long in order to accommodate the bi-directional flow and will be equipped with flow conditioners at either end. As appropriate, piping on either side of the meter tube will be designed to filter noise generated by control valves and other equipment. Data logging from this meter can be accomplished either through AGA certified flow computer communicating with the plant control system or can integrate directly with an appropriate input card.

A number of alternative flow metering technologies exist. However, it is widely recognized that ultrasonic measurement offers the most operational flexibility (highest turn down), least pressure restriction, and least amount of regular operator interface. Accordingly, no alternative metering technologies were seriously considered.

In addition to gas flow metering a chromatograph and moisture detector will be installed in order to verify that gas being transported to PG&E meets gas quality requirements. Specific makes and models of this equipment will be determined during detailed design.

The primary gas flow and quality verification will be at the PG&E installed facilities near the interconnection with Line 401. However, having accurate measurement at the compressor plant will provide operations with an additional measure of gas quality before leaving the facility.

3.5.8 Balance of Plant

This section describes the initial design for the balance of systems to be installed at the central compressor station. These systems support the major equipment described in previous sections. The balance of systems includes pig launchers/receiver, central water handling, piping, valving, and buildings. Table A-1 in Appendix A provides a list of equipment to be installed at the central compressor station. A preliminary general arrangement of these systems is shown on the facility site plan, Drawing 12361-130B-100 in Appendix A.

Pig launchers/receivers will be located at each of the plant gas inlets/outlets. These units will be located outside of the plant ESD valves and will be designed and constructed as piping according to DOT 49 CFR 192 using an appropriate design factor.

The initial design concept for central water handling entails collection of salt water from the East and West Field water gathering lines and from secondary separation. This water will be placed into onsite buffer storage tanks. The salt water will then be transferred to an on-site salt water injection well by a salt water disposal pump. The buffer storage includes three 750 barrel welded steel tanks designed and constructed according to API 12F. The disposal pump will be a high pressure piston type driven by a single speed electric motor. The pump will be prepackaged as a skidded unit including basic controls, valving and a weather proof enclosure suitable for setting directly on a gravel pad. Modifications to the proposed system that will be considered during detailed design include more or less buffer storage and VFD speed control for the pump package.

Piping inside the plant will be designed and constructed according to DOT 49 CFR 192 for compressor stations and consistent with American National Standards Institute (ANSI) 1500# service. Major valving for the plant will include quarter turn ESD valves and automated switching valves as well as globe style control valves. All actuated quarter turn valves will be full port ball type with pneumatic style actuators. ESD valve actuators will fail closed while switching valves will be double acting fail in place type. Globe style control valves will likewise have pneumatic actuators and will be controlled by the plant control system according to pressure or flow as dictated by the operational conditions. Modifications to this design include the use of plug style valves.

Buildings for the central facility will be a mixture of pre-fabricated enclosures and engineered metal buildings. Electrical switchgear and other selected pieces of skidded equipment will be pre-assembled and provided with weather-proof enclosures provided by the manufacturers. While design of these enclosures will be largely by the manufacturers according to their standard practices, the design will account for site specific considerations such as orientation, load ratings, door/window placement etc.

The compressor building and control room will be pre-engineered metal buildings. Design specifications and architectural drawings will be developed during detailed design. The dimensions of these building are listed on Table A-1 in Appendix A. The general location and orientation of these buildings is shown on the site plan, Drawing 12361-130B-100, and on the isometric view, Drawing 12361-130B-100F (Appendix A). Preliminary architectural drawings and elevation views of the compressor building are shown on Drawings 12361-160B-100 and 12361-160B-102 in Appendix A. These buildings will be delivered from the manufacturer complete with all necessary doors/windows, heating, venting, and air conditioning (HVAC), and cranes as applicable.

3.5.9 Electric Power Substation and Wood Pole Alignment

An electric substation will be located at the central compressor station. The proposed compressor station will be powered by electric motors that will receive electricity from a new, approximately 9.75-mile, 115 kV power line that will be constructed, owned, and operated by PG&E.

The 115kvD-13.8kVY 36/48/60/67Mva substation will step down the voltage of the electricity at the compressor station which will be used for gas compression, dehydration, and other auxiliary uses. The location of the substation is within the central compressor station site and is shown on the site plan. Preliminary electrical 1-Line diagrams have been developed and are available under separate cover (Drawings 12361-210B-100 and 12361-230B-003).

Initial electrical service to the substation and plant distribution system will consist of a single 115kV transmission line with an 800a minimum rating.. The substation will have two transformer bays fed from two taps on the 11kV transmission line. With two transformer bays,

the facility has the capacity to allow expansion without additional work. The second transformer bay will provide additional power supply security to the facility. The second tap transformer bay will facilitate a second line entrance for loop service from PG&E in the future. Secondary 13.8kV gear will be double-ended, with provisions for future loads to tie to the second 13.8kV bus. The future equipment would allow continued plant production if a single 115kV breaker or transformer failed.

The 115kV substation yard will be approximately 120 feet deep north to south, by 200 feet deep west frontage on the existing road along the north edge of the compressor site; the yard will be secured by a 9-foot chain link fence with razor wire on top, 15 foot gates through the north frontage, and a 15-foot compacted gravel drive within the fence on the north, east, and west sides. The first PG&E 115kV line would enter the substation yard overhead either from the west or north, terminating on a takeoff structure. The second PG&E 115ikV line would enter the substation yard overhead from east or north, terminating a second takeoff structure.

A full complement of protective monitoring and alarm relay functions will be installed through out the electrical system. These include distance, zone, and differential protection, with backup utility metering.

A new 115 kV electric power line will be constructed to interconnect into an existing PG&E 115 kV power line at Avenue 7½, approximately 5 miles east of Firebaugh at a point approximately 7.5 miles northwest of the central compressor station site. The electric power line alignment is shown on Figure 3.1-3, and site photos are provided in Section 3.1 Project Location.

A description of the proposed power line alignment routing and design is summarized below:

- Interconnect into PG&E's Dairyland-Mendota 115 kV power line at an existing steel pole located on the north side of Avenue 7½ (Firebaugh Blvd.), approximately 5 miles east of Firebaugh (power line Milepost 0.0).

- Construct approximately 0.3 mile, 115 kV power line along the south side of Avenue 7 ½ (Firebaugh Road) to the intersection of Avenue 7 ½ and Avenue 7.

- Crossing Avenue 7 northeasterly, construct a new, approximately 1 mile, 115 kV power line along the north side of Avenue 7, easterly to the intersection of Avenue 7 and Chowchilla Canal Road. A few distribution wood poles in this segment would have their electrical facilities consolidated onto the new 115 kV power line. The existing electrical distribution line would then be removed.

- Cross southerly over Avenue 7 at the intersection of Avenue 7 and Chowchilla Canal Road and intersect new wood poles on the west side of Chowchilla Canal Road for 4.3 miles. All distribution wood poles in this segment would have their electrical facilities consolidated onto the new 115 kV power line. The existing electrical distribution line would then be removed.

- From the west side of Chowchilla Canal Road, cross easterly over the Chowchilla Bypass Canal. Two engineered steel poles, approximately 120 feet tall, one on each side of the canal, will be used to span the length of the canal.

- The alignment continues easterly along the south side of Avenue 3 for 2.2 miles, terminating at the compressor station. The existing 12 kV electric distribution facilities, located on the north side of Avenue 3, will be consolidated and transferred to the new power line on the south side of the road.

Approximately 4.3 miles of the new power line will be installed by intersetting (i.e., replacing) new wood poles within existing PG&E electric distribution line corridors. These existing wood poles are located in public road rights-of-way where PG&E currently has a franchise authorizing it to operate. The existing wood poles typically measure approximately 40 to 50 feet above ground, and will be replaced with similar, but taller single and wider circuit wood poles that will measure approximately 60 to 70 feet above ground. No power lines or electric distribution lines currently exist along approximately 1 mile of the proposed power line route along Avenue .PG&E will construct the new wood pole power line in public road rights-of-way where PG&E currently has a franchise authorizing it to operate, however there may be a necessity to acquire additional land rights pending final and detailed engineering. Land uses along the power line route are primarily agricultural. The footprint of the power line is such that it will not materially interfere with agricultural production along the route.

The proposed gas transmission meter station, to be located at the PG&E Line 401 tie-in point, will require 12 kV electric distribution service hookup. The facility will receive electricity from an adjacent 12kV electric distribution line located approximately 100 to 200 feet away from the proposed meter site.

Electric and Magnetic Field (EMF) Considerations. Power frequency EMF is present where electricity is used. This includes not only utility transmission lines, distribution lines, and substations, but also the building wiring in homes, offices, and schools, and in the appliances and machinery used in these locations. The California Public Utilities Commission (CPUC) and the California Department of Health Services (CDHS) have not concluded that exposure to magnetic fields from utility electric facilities is a health hazard. Many reports have concluded that the potential for health effects associated with electric and magnetic field exposure is too speculative to allow the evaluation of impacts or the preparation of mitigation measures. Hundreds of EMF studies have been conducted over the last 20 years in the areas of epidemiology, animal research, cellular studies, and exposure assessment. A number of nationally recognized multi-discipline panels have performed comprehensive reviews of the body of scientific knowledge on EMF. These panels' ability to bring experts from a variety of disciplines together to review the research gives their reports recognized credibility. It is standard practice in risk assessment and policymaking to rely on the findings and consensus opinions of these distinguished panels. None of these groups have concluded that EMF causes

adverse health effects or that the development of standards were appropriate or would have a scientific basis.

In response to a situation of scientific uncertainty and public concern, the California Public Utilities Commission specifically requires PG&E to consider "no-cost" and "low-cost" measures, where feasible, to reduce exposure from new or upgraded utility facilities in accordance with PG&E's EMF Design Guidelines. Additional information related to EMF is provided in Appendix A. Electric power line construction methods are described in Section 3.7, Construction.

3.5.10 Gas Transmission Pipeline

The primary gas transmission pipeline will consist of an approximately 27-mile long, 30-inch diameter gas pipeline between the PG&E interconnection and meter facility and the central compressor station. The pipeline system will include:

- Pig launching and receiving station at each end to facilitate pipeline maintenance and inspection;
- Flow metering instrumentation at the product introduction and discharge points; and
- Pressure transmitter instrumentation at key pipeline points.
- Actuated isolation valves (motor operated valves, or MOV's) at the gas introduction and discharge points, and at a location along the pipeline corridor per DOT standards for natural gas pipelines.

Section 3.5.10.1 describes the proposed pipeline route. Section 3.5.10.2 describes proposed pipeline operations, including a discussion of pipeline pigging operations, and other pipeline integrity testing and maintenance operations. Section 3.7, Construction, describes the proposed pipeline construction methods, and estimated workforce and equipment requirements.

3.5.10.1 Proposed Pipeline Route

The proposed pipeline route is shown on Figure 3.1-1. The pipeline originates at the PG&E Line 401 interconnection. The interconnection is located approximately 0.5 mile southeast of PG&E's Panoche Electrical Substation. The interconnection location was carefully selected based on proximity to access roads; minimal impact to agricultural operations; and avoidance of existing and proposed development at the Panoche Electrical Substation.

From the proposed interconnection point, the pipeline will be constructed in agricultural roads and fields along Lincoln Avenue to Highway 33. HDD techniques would be used to cross under the California Aqueduct in this area. The pipeline will be bored under Highway 33 and then continue north on the east side of this road approximately 6 miles to the intersection with West Panoche Road.

The pipeline corridor will continue northeasterly on the south side of West Panoche Road to the 3-way intersection of West Panoche Road, South San Benito Avenue, and West Whitesbridge Avenue (SR 180). The pipeline will be bored under South San Benito Avenue to the south side of Highway 180 for a short distance and then the line will be bored under SR 180 to the north side of the road.

The pipeline will continue east along SR 180 to the Fresno Slough. The Fresno Slough HDD entry location will be set up in a fallow agricultural field that is across from the Mendota Wildlife Management Area. The HDD will be drilled approximately 3,900 feet to the east side of the Slough and exit at a point north of SR 180 and east of the Union Pacific Railroad rail spur that crosses SR 180 in this area. Due to the length of the HDD, the HDD exit area will require an extensive Temporary Use Area (TUA) for pipe laydown. The laydown area will be within the temporary construction corridor and measure approximately 3,900 feet during the temporary HDD operations.

The California Department of Transportation (Caltrans) has initiated construction to widen the road bed in the Fresno Slough area and reconstruct the road bridges across Fresno Slough. The pipeline design considers an appropriate setback from the future road alignment. From the Fresno Slough, the pipeline corridor will continue east for approximately 4 miles on the north side of I-180 parallel to an existing utility corridor.

The alignment then continues east through an area of agricultural row crops near Sonoma Avenue to a surface water feature referred to as the 4-Mile Slough. Boring techniques will be used to cross under this water feature. East of this water feature, the alignment will run north for approximately 2.7 miles to the south bank of the San Joaquin River. The alignment will traverse farm roads in this area with the exception of approximately 4,000 feet where the alignment will traverse through the agricultural field.

The center of the San Joaquin River forms the Fresno County/Madera County boundary. An approximately 1,500-foot HDD will be constructed to cross under the San Joaquin River. The HDD design will be coordinated with California State Lands Commission. The HDD laydown area will use existing farm roads.

From the north bank of the San Joaquin River, the alignment will follow farm roads north and east within the Storage Field to the compressor station inlet.

Additional details of the construction methods are provided in Section 3.7 Construction.

Pipeline Alignment Details

A set of eleven 11-inch by 17-inch pipeline alignment sheets are shown on Drawings 12361-180C-001 through 12361-80C-011 in Appendix A. The alignment sheets provide the following information related to the pipeline corridor:

- Title/Index map of entire pipeline corridor, with mileposts, at a scale of approximately 1-inch = 6,000 feet (Drawing 12361-180C-00A).
- Recent (2007) aerial photo base map view with centerline of pipeline right-of-way at a scale of approximately 1-inch = 1,000-feet.
- Property boundaries and ownership information.
- Proposed permanent and temporary easement locations.
- Locations and dimensions of Temporary Use Areas (TUAs) at various boring locations (drawn to scale).
- Vertical profile view with ground surface and pipeline depth at a vertical scale of approximately 1-inch = 200-feet.
- DOT pipeline safety classification and proposed valve locations.
- Location of drainages and other significant environmental features .
- Location of construction work areas for HDD and boring areas near water features.
- Location of road borings and utility crossings (where known) and associated construction work areas.
- Location of staging areas at Spreckels Sugar Plant property.
- Pipeline materials information.

The pipline mainline valve piping plan is shown in Appendix A on Drawing 12361-170C-100, and the pigging facility piping plan is shown on Drawing 12361-170C-101.

Typical pipeline design details are provided in Appendix A (Drawings 12361-180C-603 through 12361-180C-607), including:

- Typical Uncased Road Crossing
- Typical Uncased Road Crossing Section
- Typical Pipe Trench Cross Section
- Typical Agricultural Water Line Crossing (Bored)
- Typical Steel Water Line/Utility Crossing

Detail views of major borings and HDD locations are shown on Drawings 12361-180C-101 through 12361-180C-109. The pipeline hydrotest section, showing water supply and discharge points, is shown on Drawing 12361-180C-500.

Survey work on the pipeline ROW is in progress. Survey activities to date include setting controls for future survey work, including topographic surveys, easements, and other land features. For the purpose of this PEA, the alignment sheets are preliminary and rely on commercially available topography. Upon completion of the field survey, the alignment sheets will be updated to further refine the survey corridor, and the updated alignment will ultimately be included in the construction drawings. Pending completion of the detailed survey, no significant adjustments to the alignment are anticipated.

DOT Safety Design Classification and Valve Stations

DOT regulations at 49 CFR 192.5 establish criteria for pipeline design based on risks to the surrounding population. The regulations establish four design classification areas: Class 1 areas have the lowest risk (e.g., sparsely populated rural areas); Class 2 areas have some areas of risk to populations; and Classes 3 and 4 areas are the higher risk areas.

The proposed pipeline is located primarily in Class 1 areas. An area between Fresno Slough and San Mateo Avenue along SR 180 is considered Class 2 based on existing uses; and no areas are considered Class 3 or 4. As a matter of standard practice, GRS will design the pipeline to meet DOT Class 2 Standards as a minimum. Furthermore, in the Class 2 area near Fresno Slough, the design will be upgraded to meet the DOT Class 3 standards, because of potential future development along SR 180. The Class 3 design section of the pipeline will extend approximately 2 miles between the area just west of the Fresno Slough to a point east of the slough near San Mateo Avenue.

Valves will be located along the pipeline in accordance with DOT standards. A preliminary detail drawing of the proposed valves is provided on Drawing 12361-170C-100 in Appendix A.

The new pipeline and valves will be monitored by the control room at the central compressor station. Additional information related to pipeline control systems is provided in Section 3.8, Operations.

Pipeline Design, Operations, and Maintenance

During a typical injection or withdrawal cycle, the proposed gas pipeline will transport up to 650 MMSCFD of pipeline quality gas. During the withdrawal cycle, prior to introduction into the pipeline, the gas will be filtered and dehydrated, as described above.

The 30-inch diameter gas transmission pipeline will be designed and constructed according to DOT 49 CFR 192. The line is expected to be constructed of API 5L grade X70 pipe with 20 mil thickness Fusion Bond Epoxy (FBE) coating. As shown on Drawing 12361-180C-605, the pipeline will be buried to a typical depth of 5 feet to the top of the pipe, and the trench will be

typically 8 feet total depth. Trench depth will be greater than 8 feet in certain areas to maintain separation with existing utilities.

Pipeline Corrosion Control, Monitoring, and Leak Detection

Pipeline corrosion control measures will be implemented in accordance with regulatory requirements. Corrosion protection practices typically entail the use of a dual system of protective coating supplemented by cathodic protection. Protective coating is the primary method of defense against corrosion for buried steel pipe and consists of fusion bonded epoxy (FBE) which is applied before the pipe arrives on site.

Pigging Facility Equipment Requirements, Siting, and Operations

To ensure pipeline integrity and facilitate pipeline maintenance and inspection, the gas pipeline will have a pig launcher at the PG&E tie-in point and a pig receiver at the compressor facility inlet. Regular pipeline pigging, testing, and inspection will be performed as specified by Department of Transportation (DOT) and the California State Fire Marshall requirements.

The pigging facilities will be installed aboveground within concrete containment basins. Any liquids and/or wastes generated by pigging operations will be collected in the pigging vessels and then transferred by a vacuum truck to a suitable disposal site.

A pig launcher/receiver piping plan is provided in Drawing 12361-170C-101, in Appendix A. Plot locations for these facilities are shown on the compressor station site plan, Drawing 12361-1300-100, and on the PG&E interconnection and meter facility site plan, Drawing 12361-130F-100, in Appendix A. These facilities would be located be inside the security fencing at the compressor and interconnection sites.

3.6 RIGHT OF WAY REQUIREMENTS

The proposed Project facilities and pipelines will be located on private land except at major water and road crossings. The gas transmission pipeline will require easements over parcels along the pipeline route to allow for a total pipeline construction right-of-way of typically 95 feet; this area will include a post-construction permanent easement of 50 feet, and a temporary construction easement 45 feet. The Applicants have been in contact with the property owners along the route and will work to negotiate and execute easements with mutually acceptable terms prior to commencement of construction of the pipeline.

At this time, property owners have provided access for purposes of environmental assessment. As required by Section V.15 of the CPUC's Information and Criteria List, "the names and mailing addresses of all owners of land over, under or on which the Project, or any part of the Project, may be located, and owners of land adjacent thereto" is contained in Appendix C of this PEA.

A status of each type of right of way (ROW) requirement is summarized below

Private Lands

The Applicants have been in contact with the private property owners at the surface facility locations and along the pipeline route, and will work to negotiate and execute easements with mutually acceptable terms prior to commencement of Project construction.

Approximately 15 miles of the proposed pipeline will cross land owned by Westlands Water District (WWD). The Applicants are working cooperatively with WWD to locate and construct the pipeline without interfering with WWD's irrigation system and other infrastructure. Similar planning efforts have been taken with other landowners along the alignment and surface facility locations. The results of the Applicants' communications with WWD and other landowners are reflected in the proposed pipeline route.

County Roads

The Applicants will work with Fresno County to obtain any necessary encroachment permits authorizing pipeline crossings under County roads, including borings at Lincoln Avenue, San Diego Avenue, and San Mateo Road.

PG&E will work with Madera County to obtain any necessary encroachment permits authorizing power line crossings over and along Avenue 7½, Avenue 7, and Chowchilla Canal Road.

State Highway Crossings

The Applicants will work with Caltrans for encroachment permits authorizing pipeline crossings under SR 33 and SR 180.

San Joaquin River HDD Crossing

The Applicants will work with the California State Lands Commission to obtain authorization for the pipeline crossing under the San Joaquin River. The permanent lease is anticipated to measure approximately 1,500 feet long and 50 feet wide (approximately 1 acre).

California Aqueduct HDD Crossing

The Applicants will work with California Department of Water Resources to obtain an easement authorizing the pipeline crossing under the California Aqueduct. The permanent easement at this site is anticipated to measure approximately 1,500 feet long and 50 feet wide (approximately 1.7 acres).

Fresno Slough HDD Crossing

The Applicants will work with the California State Lands Commission to obtain authorization for the pipeline crossing under the Fresno Slough. The permanent easement in this area is anticipated to measure approximately 3,900 feet long and 50 feet wide (approximately 4.5 acres).

3.7 CONSTRUCTION

This section describes the Project construction schedule; staging and access requirements; and personnel and equipment requirements. This section also describes specific construction elements of each major Project component, including:

- Well Pad Preparation, Drilling, Surface Facility Installation and Gathering Lines;
- Compressor Facility and Electrical Substation;
- Tap and Meter Facility;
- Electrical Power Line ; and
- Gas Transmission Pipeline.

3.7.1 Construction Schedule

Construction activities associated with most Project components generally will occur Monday through Saturday in compliance with local requirements, except for well drilling. Well drilling and certain pipeline construction methods are a 24-hour per day operation. Each well will take approximately 20 days to construct. Once drilling operations commence, drilling will continue until completed. Pending the receipt of necessary Project approvals, the Applicants intend to begin construction during the summer of 2009 and complete construction during the summer of 2010 so that the Project may begin operation in time to meet traditionally higher fall and winter demand.

A preliminary construction schedule is shown on Figure 3.7-1. An estimated 12 months is required to construct the Project components. Construction of the various Project components will be logically sequenced to minimize the overall construction timeframe. However, the construction timing sequence will also ensure that the total construction emissions will not exceed the San Joaquin Valley Air Pollution Control District's (APCD) construction emissions threshold.

3.7.2 Equipment and Material Staging Areas

Equipment staging areas will provide laydown areas for equipment, piping and other construction related supplies, as well as space for contractor trailers and worker parking. Figure 3.7-2 shows the location of four proposed equipment and material staging areas and roadways to and from these sites. These sites are summarized on Table 3.7-1.

Table 3.7-1: Staging Areas

Staging Site	Location and Existing Uses	Staging Area Size
Spreckels Sugar Plant	Northwest corner of SR 180 and San Mateo Avenue; grazing	10 to 20 acres
Spreckels Sugar Plant (near rail spur)	North of SR 180 and west of San Mateo Avenue; grazing	10 acres
Idle Cotton Gin	Corner of Road 16 and Avenue 3, at the northern perimeter of Storage Field; developed	10 acres
Agricultural field	Adjacent to compressor station site; agriculture	6 acres

Construction of the compressor station, well pads, and pipeline within the Storage Field (i.e., north of the San Joaquin River in Madera County) will require a separate staging area. An approximately 20-acre agricultural storage yard site has been identified for this purpose. The site is located along Road 16, along the northern perimeter of the Storage Field. This staging site is currently graded and level, and was formerly used for cotton processing. An approximately 10-acre portion of this site will be selected, in coordination with the landowner. This site is shown on Figure 3.7-2, and on Figure 3.1-2, in Section 3.1 Project Location.

Construction at the Injection/Withdrawal and Observation/Monitoring well pads will be accomplished within the proposed well pad areas and immediately surrounding areas (in cases where expansion of the existing pad is necessary). If necessary, additional material staging for well pad drilling and facility construction is available at other existing well pads that are not proposed for further development in connection with the Project; along roadside areas within the Field; and potentially at other developed sites within the Field such as the agricultural storage yard described above. The farm field immediately adjacent to the east of the proposed compressor station has also been identified as a potential site for construction staging activities. The area will be returned to agricultural use at the completion of construction. This site is shown on Figure 3.7-2, and on Figure 3.1-2.

Pipeline construction in Fresno County will also require staging for pipe storage and other equipment. Two potential sites have been identified at the Speckels Sugar Plant property, located on San Mateo Avenue near SR 180. The first site is located at the corner of SR 180 and San Mateo Avenue. The second site is located behind the Speckels Sugar Plant, and adjacent to a rail spur. Both sites are presently undeveloped or used seasonally for grazing. Material and equipment deliveries arriving via rail transportation will be transported directly to the staging area via the rail spur associated with the Spreckels facility. Designated truck routes within the Mendota area provide access between the staging area and the pipeline alignment. Staging activities will not interfere with seasonal grazing operations near the Spreckels facility, except within the limits of the actual staging areas. These sites are shown on Figure 3.7-2, and on the detailed alignment sheets in Appendix A (refer to Drawing 12361-180C-008).

Equipment and material staging areas for pipeline construction, including the HDD operations, will be accommodated within the proposed 95-foot construction ROW except where TUAs must

extend outside this area (e.g., to accommodate a turn in the pipeline). TUAs are shown on the detailed alignment sheets in Appendix A.

Pending completion of construction surveys and pipeline detail design, it is anticipated that the work areas shown on the preliminary alignment sheets will be adequate to accommodate the necessary working equipment, and that any adjustments or additions to the area identified to date would be minor. However, if necessary based on additional survey information or design data, additional acreage may be necessary. If additional sites are needed, the extra sites will be selected with preference for sites that are heavily disturbed, occur adjacent to major access points, and/or are on fallow agricultural land. The staging areas will contain laydown areas for equipment, pipes and other construction related supplies, and a contractor trailer.

3.7.3 Access Roads and Construction Vehicle Circulation

The existing road network within the gas field will provide access to the proposed compressor station site and well pads. If a well site is selected that does not already have access, then an approximately 20-foot wide graveled access road will be built from the nearest existing farm road.

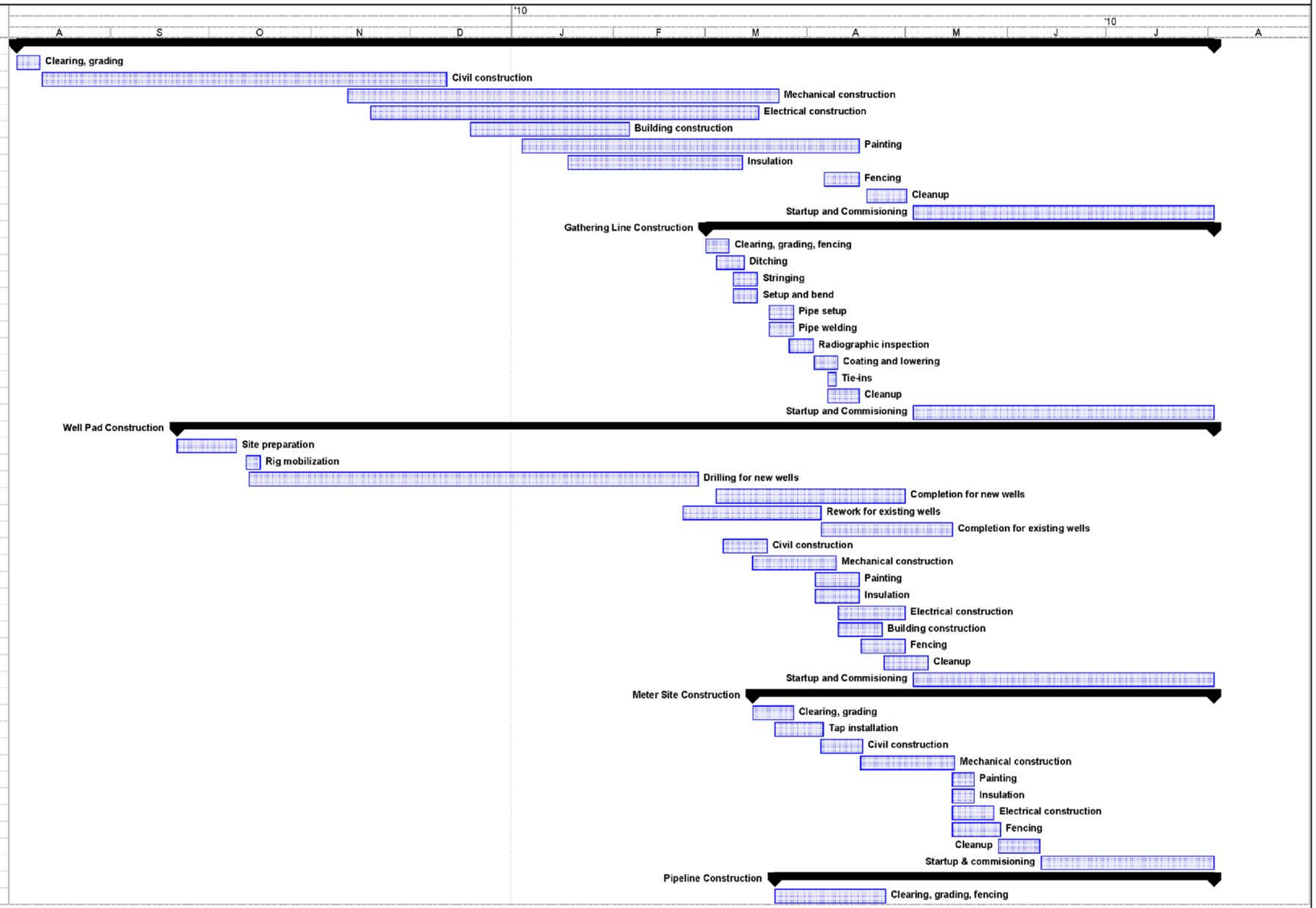
There are numerous roadway intersections near the pipeline alignment and no new permanent road improvements are anticipated for pipeline alignment access. As a general procedure, work vehicles will enter and exit the pipeline alignment in a one-way pattern using the existing roadway intersections that are in proximity to the specific work area. In limited cases, vehicles will need to enter and exit at the same location in order to avoid sensitive resources or land conflicts.

The proposed metering station at the interconnection to PG&E Line 401 is located adjacent to Lincoln Avenue, and no new access road will be needed for this site. Similarly, the electric power lines are located adjacent to existing roadways and no new access roads are required in order to obtain an electric service hook-up from PG&E.

During long-term maintenance and inspections, the pipeline and surface facilities will be accessed from existing roads.

Gill Ranch Storage Project Construction Schedule

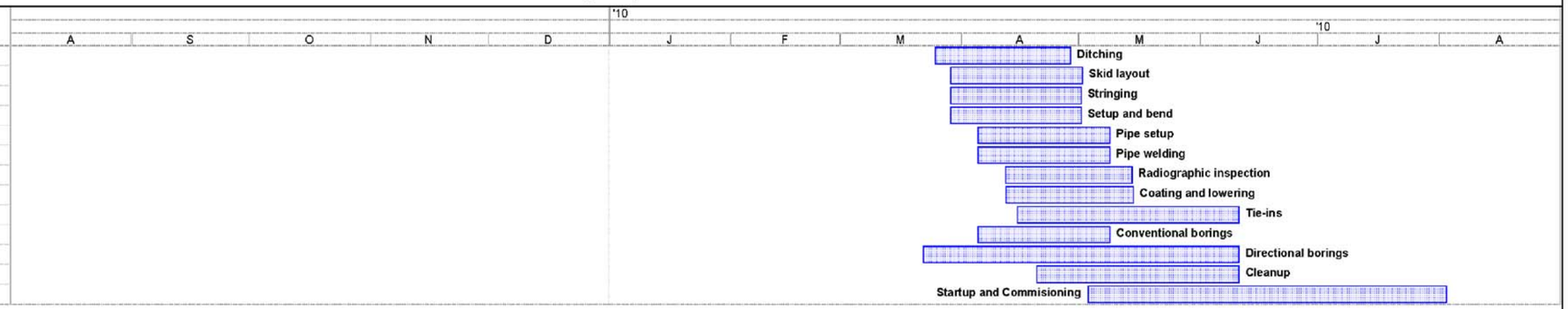
ID	Task Name
1	**Compressor Station Construction**
2	Clearing, grading
3	Civil construction
4	Mechanical construction
5	Electrical construction
6	Building construction
7	Painting
8	Insulation
9	Fencing
10	Cleanup
11	Startup and Commisioning
12	**Gathering Line Construction**
13	Clearing, grading, fencing
14	Ditching
15	Stringing
16	Setup and bend
17	Pipe setup
18	Pipe welding
19	Radiographic inspection
20	Coating and lowering
21	Tie-ins
22	Cleanup
23	Startup and Commisioning
24	**Well Pad Construction**
25	Site preparation
26	Rig mobilization
27	Drilling for new wells
28	Completion for new wells
29	Rework for existing wells
30	Completion for existing wells
31	Civil construction
32	Mechanical construction
33	Painting
34	Insulation
35	Electrical construction
36	Building construction
37	Fencing
38	Cleanup
39	Startup and Commisioning
40	**Meter Site Construction**
41	Clearing, grading
42	Tap installation
43	Civil construction
44	Mechanical construction
45	Painting
46	Insulation
47	Electrical construction
48	Fencing
49	Cleanup
50	Startup & commisioning
51	**Pipeline Construction**
52	Clearing, grading, fencing



Page 1

Gill Ranch Storage Project Construction Schedule

ID	Task Name
53	Ditching
54	Skid layout
55	Stringing
56	Setup and bend
57	Pipe setup
58	Pipe welding
59	Radiographic inspection
60	Coating and lowering
61	Tie-ins
62	Conventional borings
63	Directional borings
64	Cleanup
65	Startup and Commisioning



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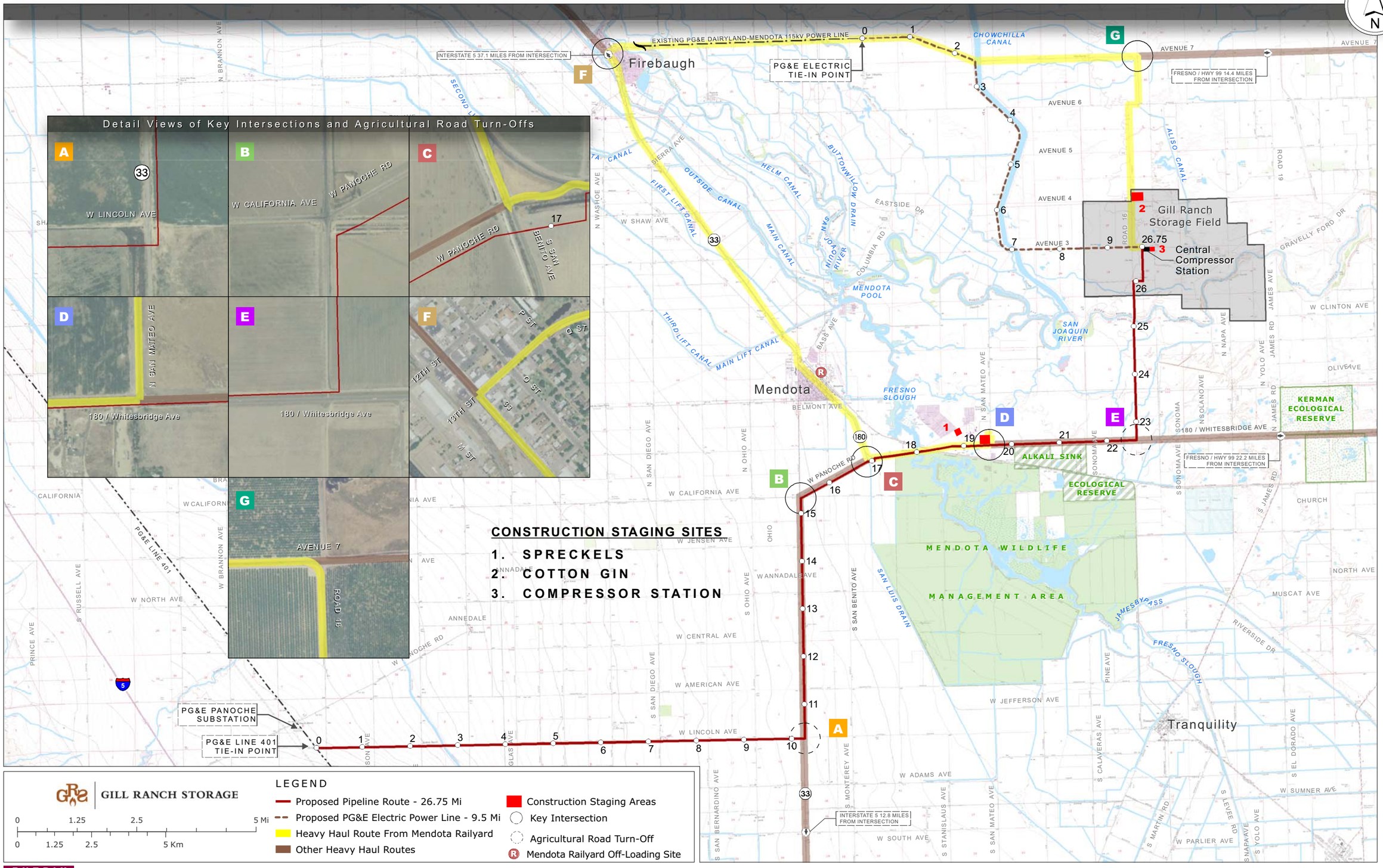


ENTRIX
Environmental and Natural Resource Management Consultants

Proponent's Environmental Assessment
GILL RANCH GAS STORAGE
FIGURE 3.7-2 | CONSTRUCTION STAGING AND HAUL ROUTES

3.7.4 Construction Workforce and Equipment

A construction contractor will be retained to install the Project components. Workforce estimates are shown in Figure 3.7-3 by month and by specialty trade. The Project will create temporary construction-related jobs over an approximately 12-month period. The workforce would vary month to month, and the work would take place in different locations (i.e., a segment of the workforce would be located in the central compressor station area and other work spreads would be located along various segments of the pipeline). During the first seventh months of construction, the average daily workforce would peak at approximately 125 workers. During months 8 through 10, the average daily workforce would peak at approximately 350 workers. During months 11 through 12, the workforce is expected to decline to less than 100 workers. Power line construction is anticipated to require up to 20 personnel.

It is anticipated that approximately 40 percent of the temporary construction labor force will be drawn from the surrounding Madera and Fresno County communities. The remainder will be comprised of workers with relevant technical expertise from outside the Project area (e.g., from the Bakersfield/Kern County area or the Bay Area). It is anticipated that these workers will reside in the local Project area temporarily during the 12-month construction period.

Standard mechanized construction equipment will be used to prepare the work sites and install the proposed equipment. Tables 3.7-2 through 3.7-7 provide preliminary lists of construction equipment requirements for the various construction phases.

3.7.5 Well Pad Preparation, Drilling, Surface Facilities, and Gathering Lines

Well pad construction consists of three phases: preparation of the well pad sites for drilling equipment; drilling new wells and reworking existing wells; and installation of well pad surface facilities. Construction of the well pads is estimated to take up to 7 months, subject to weather and equipment delivery. Equipment needs for well pad preparation, drilling, and surface facilities are listed in Table 3.7-2 above.

Well Pad Preparation. Where proposed well pads have existing gas field infrastructure (e.g., wellheads, well cellars, tanks, and associated piping), those facilities will be secured and isolated from the proposed well pad facilities by fencing or other means at the start of construction, in coordination with the landowner and facilities owner/operator. The remainder of the well pad will be cleared of surface materials and vegetation and then leveled and graded to accommodate drilling equipment. Where the pad is to be expanded, site preparation will require removal of the existing agricultural operations (if any); grading and leveling the site; and placement of a gravel road base on the well pad and well pad access. The well pad proposed sites are level agricultural land and therefore import or export of fill is expected to be minimal. Drainage and runoff will be contoured to a collection point in order to control storm water discharge

Table 3.7-2: Storage Well Pad Construction Estimated Equipment

Activity	Quantity of Equipment
Overhead Crew	1 – Office Trailer 1 – Tool Trailer 1 – 45 kV Generator 4 – Pickup Trucks
Site Clearing	1 – Motor Grader 1 – Dozer 1 – Trackhoe
Drilling	2 – Conventional Drill Rigs A/R – Tanks 1 – Completion Rig for New Wells 1 – Work Over Rig 1 – Completion Rig for Existing Wells 4 – Crew Trucks 7 – Pickup Truck
Civil	1 – Rubber Tire Hoe 1 – Boom Truck 1 – Water Truck 4 – Crew Truck 1 – Tractor Trailer 1 – Front End Loader 4 – Pickup Truck 1 – 25-ton Crane
Mechanical	1 – 25- ton Crane 2 – Welding Rigs 4 – Pickup Trucks 1 – Crew Truck
Sandblast and Paint	1 – Air Compressor 1 – Pickup Truck 1 – Crew Truck
Insulation	1 – Pickup Truck 1 – Crew Truck
Electrical	1 – Rubber Tired Hoe 3 – 10kw Generators 1 – Bender 1 – Threading Machine 1 – Tool Trailer
Building	1 – 25-ton Crane 1 – Pickup Truck 1 – Crew Truck
Fence	1 – Crew Truck
Clean up	2 – Crew Truck

Table 3.7-3: Gathering Line Construction Estimated Equipment

Activity	Quantity of Equipment
ROW Clearing and Grad Crew and Fence Crew	1 – Motor Grader 2 – Dozer 5 – Pickup Truck 1 – Crew Truck
Ditch Crew	1 – Ditching Machine 2 – Trackhoes 5 – Pickups
Stringing Crew	1 – Side Boom 2 – Tractor Trailers 1 – Crane 3 – Pickup Trucks 1 – Crew Truck
Setup and Bend Crew	2 – Side Boom 1 – Bending Machine 1 – Suburban 4 – Pickup Trucks 1– Crew Truck
Pipe Crew	2 – Side Boom 1 – Tack Rig Internal Line Clamps 5 – Pickup Trucks 1 – Bus 4 – Rigs
Welding Crew	5 – Rigs 1 – Pickup Truck
X-ray Crew	2 – X-ray Rigs
Coating and Lowering Crew	2 – Side Boom 2 – Sandblasting Equipment 2 – Air Compressor 2 – Pickup Trucks 1 – Generator 1 – Bus
Tie-in Crew (3 tie –in crews)	2 – Side Boom 2 – Rigs 1 – X-ray Rig 4 – Pickup Trucks 1 – Crew Truck
Clean up Crew	1 – Motor Grader 2 – Dozer 5 – Pickup Truck 1 – Crew Truck
Miscellaneous People and Equipment	1 – Grease Rig 1 – Fuel Truck 3 – Pickup Trucks 2- Low Boy Trucks 2 – Mechanic Trucks

Table 3.7-4: Compressor Station Construction Estimated Equipment

Activity	Quantity of Equipment
Overhead Crew	1 – Office Trailer 1 – Tool Trailer 1 – 45 kw Generator 4 – Pickup Trucks
Site Clearing	1 – Motor Grader 1 – Dozer 1 – Trackhoe
Civil	1 – Rubber Tire Hoe 1 – Boom Truck 1 – Water Truck 4 – Crew Trucks 1 – Tractor Trailer 1 – Front End Loader 4 – Pickup Trucks 1 – 25-ton Crane
Mechanical	2 – 80-ton Crane 2 – 25- ton Cranes 8 – Welding Rigs 8 – Pickup Trucks 1 – Crew Truck
Sandblast and Paint	1 – Air Compressor 1 – Pickup Truck 1 – Crew Truck
Insulation	1 – Pickup Truck 1 – Crew Truck
Electrical	1 – Rubber Tired Hoe 3 – 10kw Generators 1 – Bender 1 – Threading Machine 1 – Tool Trailer
Building	2 – Man-lifts 1 – 25-ton Crane 1 – Pickup Truck 1 – Crew Truck
Fence	1 – Crew Truck
Clean up	2 – Crew Trucks

Table 3.7-5: Tap and Meter Facility Construction Estimated Equipment

Activity	Quantity of Equipment
Overhead Crew	1 – Office Trailer 1 – Tool Trailer 1 – 45 kw Generator 4 - Pickup Trucks
Site Clearing	1 – Motor Grader 1 – Dozer 1 – Trackhoe
Hot Tap	1 - Track Hoe 2 - Welding Rigs 1 - Boom Truck 2 - Crew Trucks 1 - Hydraulic Pump 1 - Tapping Machine 3 - Pickup Trucks
Civil	1 – Rubber Tire Hoe 1 – Boom Truck 1 – Water Truck 4 – Crew Trucks 1 – Tractor Trailer 1 – Front End Loader 4 – Pickup Trucks 1 – 25-ton Crane
Mechanical	2 – 25- ton Cranes 2 – Welding Rigs 4 – Pickup Trucks 1 – Crew Truck
Sandblast and Paint	1 – Air Compressor 1 – Pickup Truck 1 – Crew Truck
Insulation	1 – Pickup Truck 1 – Crew Truck
Electrical	1 – Rubber Tired Hoe 3 – 10kw Generators 1 – Bender 1 – Threading Machine 1 – Tool Trailer
Fence	1 – Crew Truck
Clean up	2 – Crew Trucks

Table 3.7-6: Electrical Power Lines Construction Estimated Equipment

Activity	Quantity of Equipment
Footing for Tubular Steel Pole	4 – Cement Trucks 1 – Pickup Truck (gasoline) 1 – Tractor with Trailer 1 – Dump Truck 1 – Backhoe 1 – Drilling Rig
Setting Tubular Steel Pole	60-Ton Crane 1 – Tractor with Trailer 1 – Boom Truck 1 – Equipment Truck 1 – Bucket Truck 1 – Carry All (gasoline) 1 – Pickup Truck (gasoline)
Setting Transmission Wood Poles	1 – Line Truck 1 – Bucket Truck 1 – Carry All (gasoline) 2 – Pickup Truck (gasoline) 6 – Cement Trucks
Wire Pulling	1 – Cable Puller 1 – Wire Dolly 1 – Bucket Truck 1 – Line Truck 1 – Tractor with Wire Trailer 2 – Pickup Truck (gasoline) 2 – Carry-Alls (gasoline)

Table 3.7-7: Pipeline Construction Estimated Equipment

Activity	Quantity of Equipment
ROW Clearing and Grad Crew and Fence Crew	1 – Motor Grader 2 – Dozer 5 – Pickup Trucks 1 – Crew Truck
Ditch Crew	1 – Ditching Machine 9 – Trackhoes 9 - Pickups
Skid Layout and Cleanup Crew	2 – Skid Trucks
Stringing Crew	1 – Side Boom 6 – Tractor Trailers 1 – Crane 3 – Pickup Trucks 1 – Crew Truck
Setup and Bend Crew	2 – Side Boom 1 – Bending Machine 1 – Suburban 4 – Pickup Trucks 1- Crew Truck
Pipe Crew	2 – Side Boom 1 – Tack Rig Internal Line Clamps 5 – Pickup Trucks 1 – Bus 4 – Rigs
Welding Crew	10 – Rigs 1 – Pickup Truck
X-ray Crew	2 – -ray Rigs
Coating and Lowering Crew	4 – Side Booms 4 – Sandblasting Devices 4 – Air Compressors 4 – Pickup Trucks 1 – Generator 1 - Bus
Tie-in Crew (3 tie –in crews)	3 – Side Booms 2 – Rigs 2 – X-ray Rigs 6 – Pickup Trucks 1 – Crew Truck
Clean up Crew	1 – Motor Grader 2 – Dozers 5 – Pickup Trucks 1 – Crew Truck
Miscellaneous People and Equipment	1 – Grease Rig 1 – Fuel Truck 3 – Pickup Trucks 2 – Low Boy Trucks 2 – Mechanic Trucks

Drilling. Gas storage well drilling is the boring of a new well either vertically or at increasing angles up to horizontal. Three different well types will be drilled at the Gill Ranch Storage Project site. These include up to 15 Injection/Withdrawal wells, up to seven Observation/Monitoring wells, and one salt water disposal well. The salt water disposal well site is located within the compressor station site therefore drilling activities will also take place at the compressor site. In addition to drilling these new wells, certain existing wells may be re-entered for the purpose of ensuring that the well casings are adequately sealed to prevent potential gas migration through the well bores.

The typical IW well pad will accommodate up to four wells as described in Section 3.5, and shown on Drawing 12361-130D-200 in Appendix A. Setting depth of the well will vary depending on the exact depth of the reservoir at each specific well location. Appendix A provides preliminary drilling plan specifications, including:

- Rig work sequence, specifications and equipment list;
- Onsite materials and waste handling; and
- Air emissions, noise, lighting, and security measures.

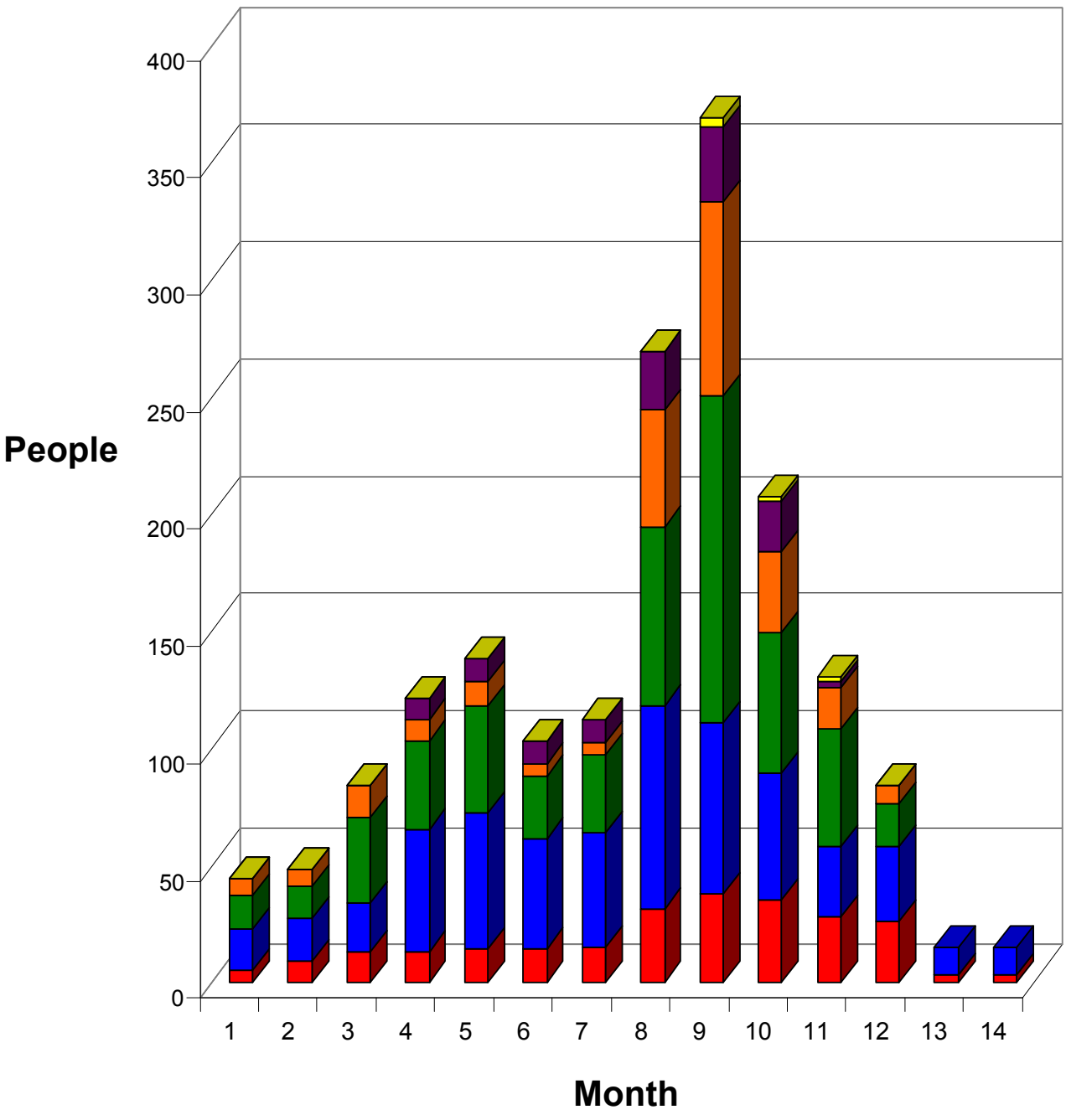
These drilling plans and specifications will be refined prior to the start of drilling.

Once the site is prepared and contoured, the mobile drilling rig and associated equipment and tanks will be driven to the pad. The type of drilling rig to be used is self-contained and will be relocated for each well. Typical equipment associated with the rig includes pipe racks, substructure, mud system, changing quarters, and tool pusher trailer, and power pack.

The drilling rig will operate 24 hours per day, 7 days per week while each well is drilled and completed. There will be two, 12-hour personnel shifts each day. After the drilling/completion of a well is complete, the drilling rig will be relocated to the next well position. Equipment and materials typically will be delivered during daylight hours.

Drilling activities typically involve the use of the rig's rotary table to turn the drilling bit and attached drill pipe. As the bit advances deeper into the subsurface, additional pipe is added in the pipe segments. Lengths of pipe are taken up from the pipe rack and held in place until the drill operator is ready to attach the new pipe segments. After conducting safety checks, the rotary table is stopped, the drill string is unscrewed, and new lengths are added. The system is repressurized and drilling continues. Drilling mud is used to lubricate the bit, bring drill cuttings back to the surface, and control down hole formation pressure. All fluids used in or for the drilling operation will be contained in temporary mobile tanks or 55-gallon drums stored within a containment area. Fluid and mud circulation systems are based on closed-loop designs, which result in no discharge. Once the well is in place, ancillary valving, piping, and monitoring equipment is installed and tested.

Gill Ranch Storage
Estimated Construction Workforce



GILL RANCH STORAGE

Foremen | Skilled laborer | Laborer | Equipment Operators | Welders | Inspectors

Surface Facilities. New surface facilities will be constructed at each well pad site at the completion of drilling. New surface facilities will include the wellhead and production tree, gas water separator, ultrasonic flow meters located inside a pre-fabricated enclosure, miscellaneous piping and valves, methanol storage and a chemical injection/control building which will be a preassembled skidded package, with a weather-proof enclosure.

Surface equipment at the Observation/Monitoring wells will be limited to the wellhead and a small building that houses a data collection system. Once the surface equipment has been installed perimeter fencing will be constructed. Cleanup and any required restoration will be performed as work on the area is finished.

Gas Gathering and Water Gathering and Disposal Pipelines. Produced fluids (salt water) will be piped to the storage facilities located at the compressor station site via a buried steel 4-inch diameter water line. Gas will flow in and out of the wells through a buried 12-inch and 16-inch diameter pipeline connected to the central compressor station facilities. All gathering pipelines will be buried 5 feet below ground.

Construction of 12-inch and 16-inch diameter high pressure gas gathering pipelines and the 4-inch diameter high pressure water gathering and disposal pipelines will begin during the last month of compressor station construction and will take approximately one to two months, subject to weather and equipment delivery. Equipment needs for gathering line construction are listed in Table 3.7.3.

Preliminary gathering line locations are shown on Figure 3.1-2 in Section 3.1. The lines will follow existing farm roads between the well pads and the central compressor facility, and will be buried along their entire length except at the wellhead, and within the fenceline of the compressor station. The gathering lines will be constructed using similar pipeline construction techniques as described in Section 3.7.9 for the gas transmission pipeline. Due to the smaller diameter of the gathering lines, the pipeline trench would be approximately 6 to 7 feet deep by 2 feet wide. In addition, no water or major road crossings are anticipated based on the proposed and alternate well pad locations therefore no special construction techniques such as horizontal boring methods would be required.

3.7.6 Central Compressor Facility and Electrical Substation

The central compressor station site is on level agricultural land. Construction activities will involve clearing and grading; construction of a perimeter earthen berm and equipment and building foundations; ground surface preparation at access points and within the equipment area; erection of structures to house the compressors and associated control equipment; installation of equipment and piping; construction of perimeter fencing; and cleanup and restoration of the site. Construction of the compressor station is estimated to take 12 months, subject to weather and equipment delivery. Equipment needs for compressor and electrical substation construction are included in Table 3.7-4.

Due to the very level terrain, and pending completion of the geotechnical analysis and detailed grading and drainage plans, it is anticipated that normally occurring drainage from adjacent properties will not warrant special measures to protect the site from run-on from adjacent properties. The detailed grading and drainage plan will, if necessary, direct drainage around the facility with ditches or culverts in order to maintain the natural flow without impact to the station.

Pending completion of the geotechnical analysis and related soils report, the volume of required imported fill material is not yet estimated. Based on field observations to date, it is anticipated that native soils will be generally suitable for subsurface foundations and significant volumes of over-excavation for foundations or imported engineered fill material will not be necessary.

The compressor pad site is designated on FEMA flood maps as "Zone X." Areas in this zone are outside of the floodplain and do not normally require special design considerations for floodproofing (e.g., structures would not need to be elevated above existing grade for purposes of flood protection). The flood zone designations in the vicinity of the Storage Field are determined, in part, by the existing levees on both banks of the San Joaquin River. The integrity of the levees in the project area is not known. However these levees were designed to accommodate regulated flow volumes from upstream releases at Friant Dam Therefore, it is anticipated that these levees provide adequate protection to the surrounding properties. Therefore, at this time, pending completion of the geotechnical analysis and detailed grading and drainage plans, no special flood protection design measures are proposed for the central compressor station.

Foundation excavation will be performed as needed, and all backfill will be compacted in place. Excess soil will be used onsite or will be disposed of in an approved area off site. Compressor building construction will begin after the compressor/engine skids are installed on concrete foundations. Typically, the steel frame of the building is erected, followed by installation of the roof, exterior casing, and insulation as may be needed for noise attenuation.

Gas pressure piping at the compressor station will involve welded construction, except where connected to flanged components. The piping work may begin in a fabrication shop off site. If offsite fabrication is used, the prefabricated pieces will be shipped to the site and installed in place. Piping installed below grade will be coated for corrosion protection prior to backfilling, and a cathodic protection system will be installed to protect underground piping. Aboveground valves and piping will be installed on concrete pipe supports, and protected from external corrosion by paint coatings.

Equipment such as the glycol dehydration units, reboilers, and coolers will be installed on pads or skids. Pig receivers will be installed on pads with concrete containment. The aboveground storage tanks will be installed within diked areas or otherwise installed within secondary containment. Prior to placing the compressor station in service, the gas piping system (both above and below ground) will be hydrostatically tested. Controls and safety devices, such as the

emergency shutdown system, relief valves, gas and fire detection facilities, and other protection and safety devices, will be checked and tested.

After completion of and start-up and testing of the equipment, the compressor station site will be final graded, and disturbed areas will be graveled. Cleanup and restoration of various parts of the site will be completed as work on the area is finished. The access roads and parking areas will be graded and graveled, or other aggregate will be spread on the surfaces.

Construction of the electrical substation will occur as a component of the compressor station construction as described above. Additional information is provided in Section 3.7.8 below, based in part on the CPUC's preliminary guidelines for electrical transmission and substation applications.

3.7.7 Tap and Meter Facility

The tap and meter facilities will be located at the interconnection to PG&E's backbone line 401 adjacent to Lincoln Avenue. The facility will measure 100 feet by 100 feet (approximately 0.25 acre). Site preparation will include vegetation removal, grading, and installation of security fencing. PG&E will install no more than two wood poles to provide electric power service to the meter facility. Construction of the tap and meter facility is estimated to take four months, subject to weather and equipment delivery. Equipment needs for tap and meter facility construction are included in Table 3.7-5.

3.7.8 Electric Power Lines

Construction of a new 115kV power line will utilize electric distribution alignments to the greatest extent possible to consolidate the new power line with the existing 12kV electric distribution circuits. Approximately 8 miles of existing distribution line, upon completion of construction, will be re-located with the new 115kV powerline. Consolidation of existing electric distribution lines will involve installation of wood poles for the powerline parallel to the existing distribution line, installation of power line conductors and associated facilities, and transferring or "underbuilding" the existing distribution lines below the new power line conductors. Existing electric distribution facilities will be removed upon cutting over the existing electric distribution lines to the new underbuilt power line. Construction of appromately 1 mile of new power line will be required in areas where there are presently no electric distribution lines (Avenue 7). Equipment needs for electric power line construction are included in Table 3.7-6. Pending final engineering design, typical engineering and construction of a 115 kV power line will be engineered and built as follows:

- Typical design of the new power line will follow T-1 tangent construction standards that have been developed by PG&E in accordance with CPUC General Order 95 (G.O. 95). The power line for the Project would be supported by wood poles that would be approximately 15 inches in diameter at the base and approximately 9 inches in diameter

at the top. These new wood poles would be approximately 60-70 feet in height, which is approximately 10-20 feet higher than the existing poles. Most of the new power line will have existing electric distribution lines transferred to the new poles (i.e., the new power lines would be underbuilt with distribution circuits). Two steel poles will be used on each side of the Chowchilla Bypass Canal crossing. These poles will be 120 feet high and approximately 30 inches in diameter at the base.

- Conductors would be installed on each pole with a minimum conductor height of approximately 25 feet above ground. Figure 3.7-3 provides an inset photograph of the typical wood pole configuration that will be used for the new power lines. Span lengths between the poles would be approximately 330 feet. The poles would be directly embedded at a depth of approximately 8-10 feet depending on load and soil characteristics. No concrete foundations would be required except at the crossing of the canal where tubular steel poles will be installed and at the tie-in point where a new engineered pole may be required. Pole locations are along road shoulders with available road access. No new access roads will be needed.

- Construction of the power line would include site clearing and grading for new pole sites (if required) and pull and tension sites, pole delivery to each location, soil auguring at each location, assembling the wood pole (i.e., cross arms, insulators, etc.), installing the pole, stringing the new conductors, and replacing the existing line and hardware on the new pole. Details for each of these construction steps are described below.

Site Clearing and Grading. Remove vegetation and grade pull and tension sites as needed. Pole locations are on relatively level ground next to existing poles therefore clearing and grading of these areas is expected to be minimal.

Tie-In Pole and Switching Gear. Pending final engineering design, the tie-in pole may require modifications or replacement with a similar structure and in both cases will require additional switching gear.

Replacement and Installation of Wood Poles. The following work sequence will be followed for pole replacements along the proposed alignment.

- Mobilize pole truck to new wood pole sites utilizing a line truck, bucket truck, carry all and pickup.

- Auger new hole and stockpile soil adjacent to the pole site (typically 10 feet deep by 2 feet in diameter, or approximately 1.2 cubic yards)

- Install new pole and secure in place. Typically a wood pole is secured by backfilling the hole with the native soil and that soil is tamped with a hydraulic tamping device in order to meet acceptable compaction requirements. Guy wires are required on all poles with an angle greater than 3 degrees and on all poles that wire is dead ended on.

- Restore disturbance area with clean fill.

Install New Engineered Poles at Chowchilla Canal Crossing. The following work sequence will be followed for installation of two new approximately 120-foot high steel engineered poles that will span the Chowchilla Canal near Avenue 3.

Special Procedures for Water and Road Crossings. Guard pole locations would be installed at all road and water crossings. These are temporary facilities and are removed after conductors are installed. Typical guard structures are standard wood poles, 60 to 80 feet tall, arranged in such a manner as to stop the fall of a conductor should it momentarily drop below a conventional stringing height. At a typical guard structure installation, each side of the site being guarded would have two holes augered that would receive guard poles. Poles would be ordered and dropped at their particular usage site. The work is performed with standard transmission and distribution equipment. If required, temporary netting would be installed in order to protect some types of under-built infrastructure. At the conclusion of the power line installation process, the guard poles would be removed and the holes would be refilled.

Install Conductors. This phase of construction consists of equipment set up for cable pulling which includes wire dolly, cable puller, line truck, bucket truck, tractor with wire trailer, pickup truck and carry-all. Cable pulling requires a 20-foot by 200-foot area at each end of the pull, one for feeding the wire and one for pulling. The distance between pulling sites will be 2 to 3 miles. Seven pull and tension sites are proposed for installing the conductors, however, pending final engineering design fewer or more pull and tension sites may be required. The following work steps are required:

- A lead line would be spooled out from a motorized drum at the first wire site and installed through travelers at each pole. The lead line would then be attached to 'pullers' and pulled back through the travelers by the stationary ground-based equipment at the second wire setup site.

- Next, the conductors would be attached to the pullers and pulled back through each pole clamp to the second wire pulling site. After the conductors reach the pulling site, they would be correctly sagged and tensioned, then permanently clipped into the clamps at each structure. In order to transfer the existing distribution line to the new power line, a temporary power outage would most likely be necessary.

- After the distribution conductors are transferred from the existing poles to the new poles, the existing poles could either be removed or cut at or below ground level. Existing poles would be removed from the ROW with a line truck. Poles will be disposed of by first cutting the old poles in 8-foot to 10-foot sections and then transporting the pole sections back to the local PG&E yard where the sections will be transported by an approved third party vendor to an approved disposal site.

- The final step in the process involves energizing the new cable. To accomplish this, the circuit is temporarily taken out of service. Once the line is out of service, crews can safely connect the existing overhead lines to the new lines. When this is finished, the line is returned to service.

Number and Location of Poles. The poles will be placed at typically 330-foot intervals (approximately 16 poles per mile). Based on the approximately 9-mile alignment, an estimated 145 new wooden poles would be installed, in addition to two new steel poles. The pole alignment is shown on Figure 3.1-3, in Section 3.1. The precise location of existing and proposed poles will be developed during detailed design.

Table 3.7-8 summarizes typical proposed pole installation dimensions.

Table 3.7-8: Typical Pole Installation Details

Pole Design	Proposed Project
Pole diameter: Wood poles Engineered tubular steel pole	 At base = approximately 15 inches at tip = approximately 9 inches At base = approximately 30 inches At tip = approximately 12 inches
Auger Hole Depth: Wood Poles Engineered tubular steel pole	 8-10 feet 8-10 feet
Permanent Footprint per Pole Wood Poles Engineered tubular steel pole	 2-4 square feet 2-4 square feet
Number of Poles: Wood Poles Engineered tubular steel pole	 160 2
Average Work Area around Poles (e.g. for old pole removal and new pole installation	20 feet x 100 feet
Total Permanent Footprint for Poles	Approximately 324 to 648 ft2 (0.007 to 0.015 acres)

Conductor and Insulator Configuration. Conductor insulator will be 715 AL with non-ceramic insulators.

Conductor Height and Configuration. The minimum conductor height above the ground will be 30 feet for transmission and 25 feet for distribution per GO-95, with ten-foot spacing between conductors.

Other Infrastructure. The existing poles do not carry other infrastructure (e.g., fiber optic or telephone).

Electrical Substation Construction. The CPUC's preliminary guidelines for electrical transmission and substation applications request specific details for substation construction. As discussed in Section 3.4, a new electrical substation will be constructed within the 10-acre plot site for the central compressor station. The substation location is shown on the plot plan in Appendix A, Drawing number 12361-130B-100. Substation construction will be integrated with the compressor station construction. Therefore, all aspects of the substation construction (e.g., site preparation and grading, construction equipment and personnel requirements, landscaping, etc.) are addressed in the context of the compressor location construction methods described throughout this section. No unique construction methods or equipment are required for the substation.

3.7.9 Gas Transmission Pipeline

The 30-inch diameter gas transmission pipeline will be constructed beginning from the PG&E high-pressure backbone system (Line 401) near the I-5 corridor to the inlet of the central compression facility, approximately 20 miles northeast of the tie-in point. Construction of the pipeline is expected to begin in month 8 of the 12-month construction schedule, and last approximately five months depending on weather and equipment delivery. Equipment needs for gas transmission pipeline construction are included in Table 3.7-7.

Water crossings will be avoided to the extent practical. However, the location of the Storage Field relative to the PG&E Line 401 interconnection dictates that certain water bodies cannot be avoided, including the San Joaquin River and the Fresno Slough. Potential impacts to these features would be avoided by horizontally boring. Horizontal boring methods are described below.

The proposed route would avoid crossing the Mendota Pool and several interrelated north-south canals located north of the City of Mendota. The alignment would also avoid crossing Panoche Creek, located north of the Line 401 interconnection point. Crossings at railroads and major roads would also be bored.

Section 3.5.10 above provides details of the proposed pipeline alignment and construction methods for each pipeline segment. Table 3.7-9 summarizes the construction methods at road crossings and major water features.

Table 3.7-9: Pipeline Construction Methods at Crossings

Pipeline Segment	Construction Method	Station Number	Map Reference
WDD Water Line Crossing at Fairfax Avenue	Conventional Bore (100 feet)	10+89.0 – 11+89.0	12361-180C-000
California Aqueduct	HDD (1,600 feet)	135+31.1 – 151+31.1	12361-180C-001
San Diego Avenue	Conventional Bore (100 feet)	383+59.2 – 38.4+59.2	12361-180C-002
Hwy 33	Conventional Bore (200 feet)	544+17.3 – 545+37.3	12361-180C-003
Whitesbridge Avenue	Conventional Bore (490 feet)	835+40.0 – 839+50.0	12361-180C-004
SR 180	Conventional Bore (200 feet)	894+39.6 – 896+39.6	12361-180C-005
Kings Slough and SPRR	HDD (3,900 feet)	881+33.0 – 916+33.0	12361-180C-006
Four-Mile Slough	Slick Bore (600 feet)	1116+47.2 – 1132+12.2	12361-180C-007
San Mateo	Conventional Bore (100 feet)	975+05.9 – 976+05.9	12361-180C-008
San Joaquin River	HDD (1,500 feet)	1263+07.6 – 1278+07.6	12361-180C-009

The following construction methods will be used to install the gas transmission pipeline. Similar methods will be used to install the gas and water gathering lines connecting the well pads to the central compressor station.

Surveying Right-of-Way

The pipeline alignment will be surveyed and identified prior to beginning construction activity. Alignment identification will include staking the centerline of the pipeline, foreign line crossings, and the limits of the construction work area. As part of this preconstruction phase, environmentally sensitive areas (e.g., wetlands and special-status species habitat) will be marked.

Underground Facilities Coordination

To avoid or minimize construction conflicts with existing utilities and public services, Gill Ranch Storage will coordinate closely with the Fresno County and Madera County Public Works Departments during final project design to identify any potential utility conflicts and initiate relocation efforts, if necessary. Gill Ranch Storage will also contact Underground Service Alert (USA) at least two full working days before construction activity begins. USA will contact all owners of underground pipelines and utilities that are registered with USA and inform them that construction is about to begin in their service area. This notice allows those owners to mark the areas near the construction site where their underground facilities are located so that these areas can be avoided during project construction.

Clearing and Grading

A clearing crew will clear the work area of vegetation and obstacles (e.g., trees, brush, and rocks) on land used as orchards or vineyards. Trees, shrubs and other vegetation will be chipped or stored along the edge of the construction right-of-way for later use as an erosion control mulch, or will be disposed of in another manner consistent with local regulations and landowner or agency requirements.

Once cleared, the ROW will be graded where necessary to create a reasonably level working surface to allow safe passage of equipment. Temporary erosion control measures (e.g., silt fences, straw bales) will be installed where erosion could be a factor. A minimum of 6 inches of topsoil, or as determined by the Project's architectural specialist, will be stripped and stockpiled along the ROW. This will leave the other side of the ROW available for access, material transport, and pipe assembly. Salvaged topsoil will be replaced on disturbed areas as part of the restoration and cleanup phase of construction activities.

Pipeline Trenching Methods

Trenching will be accomplished with backhoes or trenching machines. The trench will be excavated to a depth sufficient to provide the appropriate amount of cover, which generally will be a minimum of 5 feet over all pipelines. A typical trench dimension is shown on Drawing 12361-180C-605 in Appendix A.

Trench spoil will be deposited on the spoil storage portion of ROW. The trench width for the pipeline will be approximately 54 inches; however, the trench may be wider in wet or sandy areas to allow for unstable soils and a sloped trench wall. Based on the known geologic conditions in the project area, blasting will not be required. The construction easement will be 95 feet wide with a permanent easement width of 50 feet. In areas that contain sensitive biological resources, the pipeline corridor will be reduced if feasible to avoid direct and indirect effects on adjacent sensitive resources.

Stringing, Welding, and Installation

After the construction right-of-way has been prepared and the trench excavated, pipe and associated support timbers (skids) will arrive on the job site by highway trucks, along with pipe handling equipment in the form of crawler-mounted sideboom tractors and hydraulic cranes. The trucks will travel down the ROW, being off-loaded as they travel; they will place joints of pipe end-to-end, supported by skids with pad material to protect the coating. When emptied of their cargo, trucks will either turn around in areas provided or they will proceed to the next public road crossing for egress. Mud on the vehicle tires, wheels, and undercarriage that could be dropped in transit on public roads will be removed before the vehicles leave the right-of-way.

Pipeline segments, bent to conform to the trench contour, will be placed along the ROW parallel to the trench. Pipe ends (bevels) will be cleaned prior to welding by means of filing or wire brushing to remove rust, scale, and dirt. A sideboom crawler tractor or other suitable hoisting machine will lift each joint of pipe to abut and align with the bevel of the previous joint, and a suitable space for welding will be attained. Welders qualified by testing to the appropriate welding code then will apply an initial pass of weld and will progress to the next aligned joint as the first weld pass is applied. Subsequent welding passes will be applied by other welders following the initial pass, until satisfactory weld metal has been applied. Each pass, including the final pass, will be mechanically cleaned of slag by wire brush and/or grinding disc, and the welds will be radiographically or ultrasonically inspected for defects. Welds that are defective

beyond code limits will be repaired by grinding out the defect and rewelding the objectionable area, or they will be removed and rewelded.

Welding will be performed in accordance with the American Petroleum Institute Standard Number 1104, U.S. Department of Transportation (DOT) pipeline safety regulations 49 CFR Part 192 (latest editions). Completed welds will be visually and radiographically or ultrasonically inspected in accordance with the same standards to determine the integrity of the welds.

After passing quality control checks, the weld areas (field joints) will be coated with either a powdered epoxy applied to induction-heated weld areas; with a liquid epoxy; or with a mastic sleeve that, when heated, will shrink to form a snug fit on the pipe, and the mastic will become viscous to eliminate air pockets and provide adhesion. The pipe will be visually checked for damaged coating (holidays), and damaged areas will be repaired by means of melting a stick form of epoxy onto the damaged area. After the last handling, and electrical coating tester attached to a girth spring will be passed along the entire length of the pipe, alerting audible signal presence of defects (holidays) in the pipe coating. These damages will be repaired prior to lowering the pipe into the trench.

Pipeline sections that are ready to be installed into the trench will be lowered in by means of nylon straps or wheeled "cradles" suspended from sideboom tractors or other hoisting equipment. Where rock is encountered, the bottom of the ditch will be padded with sand or fine-grained soils. Inspectors will ensure that the minimum required cover is attained. This will be accomplished by measuring the pipe depth.

Trench Backfilling

After the pipe is placed into the trench, the trench will be backfilled with the previously excavated material. Where topsoil is stored separately from subsoil, the subsoil will be backfilled first and then the topsoil will be replaced. Although not anticipated, if rock conditions exist in the Project area, a layer of rock-free soil will be placed over the pipe to protect the coating, and then the backfill operation will be completed. A soil mound will be left over the trench to allow for soil settlement, unless otherwise required by the landowner.

Horizontal Boring Method

As noted in Section 3.5.10 and Table 3.7-9, the following areas will be crossed using HDD methods: California Aqueducts, Kings Slough, and the San Joaquin River.

Conventional Bore

This method involves the excavation of bore pits on each side of the crossing using a depth below the invert elevation of the pipe. An auguring machine is lowered into the bore pit and a hole is then augured along the alignment and product pipe is jacked forward, behind the auger head. When the auger reaches the bore pit on the opposite side, the product pipe is pulled or jacked through the hole.

Slick Bore

During the slick bore process, a section of artifical bore pipe with a cutting shoe is welded to sections of the product pipe. This assembly is advanced horizontally at a pre-determined depth driven by a pneumatic pipe manner. The cutting shoe is welded to the front of the lead bore pipe to help reduce friction and cut through the soil. When the desired horizontal distance is achieved, the bore pipe is cut from the product pipe and the bore is complete. In addition, Bentonite lubrication is used to help the ramming operation.

A boring plan will be prepared for each drainage crossing that includes a detailed description of the drilling unit, hole diameter, depth of cover, directional survey and control plan, mud system, additives, and mud pumping pressures.

A site-specific Frac-Out Contingency Plan will be developed as part of the bore plans. This plan will focus on minimizing the potential for a frac-out associated with tunneling activities; providing for the timely detection of frac-outs; and ensuring an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling lubricant (i.e., bentonite). The specific elements of the Frac-Out Contingency Plan are described further in Section 3.9.

Hydrostatic Testing

Following installation, the integrity of the entire pipeline will be assessed by hydrostatic testing (i.e., testing the pipe with pressurized water). Hydrostatic testing will be conducted in accordance with the requirements. DOT pipeline safety regulations 49 CFR Part 192; the Applicants' testing specifications; and applicable permits. Based on preliminary Project plans, hydrostatic testing of the pipeline would be performed in three sections. From west to east these sections would require an estimated volume of approximately 1.1 million, 1.4 million, and 2.1 million gallons of water, respectively. Potential sources of hydrotest water have been identified as follows, in order of preference:

- Water from a local purveyor, such as the WWD, which maintains water supply lines located near the western end of the Project pipeline
- Water from privately owned agricultural wells
- Municipal water supplies.

Water provided by a local purveyor, such as Westlands Water District (WWD). There is currently water delivery infrastructure near the proposed pipeline alignment, so there would be no need for long distance delivery of water, or need to pump water from a well. Upon completion of hydrostatic testing of the western section of pipeline, the eastern section of pipeline (which is not in the WWD) could also be hydrostatically tested with the same water. Upon completion, the water would be returned to the local purveyor.

Water derived from a local well or wells. This option would entail removal of water by pumping from one or more groundwater wells. Under this scenario, a private land owner would be contracted to provide water for the testing procedure. Upon completion of the hydrostatic testing, the water could be used for irrigation or treated and reinjected, allowed to percolate in a detention basin, or discharged to a storm water basin after treatment. Water to be reinjected may have to be treated for pesticides and nitrates prior to reinjection to avoid contamination of the aquifer. If reinjection is proposed, then prior to reinjection, the hydrotest water will be tested to ensure that the quality is equal to or better than that of the water in the injection well and to ensure that the water meets all applicable regulatory water quality objectives. Any discharges will comply with applicable regulations.

Water derived from a municipal source. This option would likely require the use of large trucks to deliver water to the site. If municipal water is proposed as a hydrostatic test water source, then it would be treated to remove chlorine prior to discharge.

A hydrotest plan will be developed that includes appropriate disposal and treatment methods.

3.8 OPERATIONS AND MAINTENANCE PROCEDURES

This section describes the personnel requirements, and the general systems and procedures that will be implemented during the operational life of the Project.

Operations Personnel and Training

The Plant Manager (PM) will represent the Applicant to promote Project Objectives. All operations staff, maintenance, and electrical staff report to the PM. The PM will plan and coordinate the station activities and manage the public and community relations and ensure that all operational and safety issues are addressed.

Implementation/Electrical personnel (I/E personnel) will develop and manage preventative maintenance programs. Will program control systems to ensure facility can operate safely and reliably within the design parameters. Work in a safe manner to provide the necessary knowledge and expertise to identify and repair, as appropriate, electrical and instrument equipment within the facility and at the wells.

Maintenance Mechanical personnel will develop and manage the preventative maintenance and provide support to the operations team to troubleshoot and repair compressors, instrument air compressors, methanol pumps, etc.

Pursuant to the Operating Agreement between GRS and PG&E, operation and maintenance of the proposed facilities will be performed by GRS operations and maintenance personnel during the development, permitting, and construction phases, and for at least three years from the date commercial operation begins. As appropriate, additional specialized personnel and equipment will be onsite during normal maintenance, and during major maintenance activities (e.g., equipment replacement, subsurface well work, etc.).

As discussed above, a prefabricated metal office/control room will be located at the central compressor site. Operations and maintenance personnel will be present at the facility during normal daytime workday hours. Operations and maintenance personnel will be on call after hours and will electronically remain in communication with the control room. Operations staff will have the means to stay in communication with the facility and address operational issues from their home PC or travel to the facility as required. There will be times when the facility will be manned 24 hours. These may include times when there are equipment problems, on-going special projects, or when there are issues relating to the operation of the PG&E pipeline system.

A written operator qualification plan will be developed prior to the compressor station commencing operation, as required by the Office of Pipeline Safety and the CPUC. The plan will outline the tasks to be performed by the operator relating to either the pipeline system or the central compressor station and well pad sites. All operations and maintenance personnel will be required to participate in either formal training sessions or an online training program, and then pass a qualification examination. Re-qualification will be required periodically in accordance with the written plan.

An emergency response plan will also be developed prior to start of commercial operations. The plan will identify how personnel will respond to emergency situations related to the storage operations. Within that plan will be a structured on - call list of people to notify depending on the seriousness of the emergency. For example a level one emergency may not warrant the immediate notification of the senior people within the company; and a level three emergency may warrant notification of senior company personnel, etc. All personnel will be properly trained regarding when to initiate the emergency response plan. A mock exercise to be performed on an annual basis will demonstrate the strengths and weaknesses of the plan in dealing with emergency situations and evaluate the operating staff's capability in carrying out the plan.

GRS and PG&E both have a strong commitment to working safely on the job. Regular safety meetings will be conducted to ensure operations personnel carry out that commitment. A rewards program will be initiated as people demonstrate their commitment towards safety and successfully completing milestones that will be established in a project-specific health and safety plan.

A damage prevention program, which includes a mechanism for letting property owners know the 24-hour number to call in case of a Project-related emergency, will be developed. Information pamphlets and letters will be sent to property owners periodically as a reminder to call the facility operator before digging near or over the pipeline.

General System Monitoring and Control

Modern gas facility control systems enhance operational efficiencies and provide for greater safety. The control room at the central compressor site will serve as the focal point for Project

systems monitoring, control, and operation. The well pad site monitoring and control functions will be connected to the control room computer system via a radio transmission system. In addition, operations personnel will monitor total facility gas flow and gas quality through a Supervisory Control and Data Acquisition Remote Terminal Unit located in the control building. Control and monitoring functions for equipment and operations within the central compressor site associated with injection and withdrawal operations will be via hardwired control systems connected to the control room computer system.

Well Pad Site Monitoring and Control

The flow of gas in and out of storage wells will be metered so that the characteristics and performance of the gas storage reservoir may be properly monitored. Wellheads will be equipped with emergency shutdown valves to close off the flow of gas from the well to the central compressor facility under certain preset conditions (fire, excessive flow, abnormal pressure, etc.). In addition to the wellhead emergency shutdown valves, a master emergency shutdown valve will be installed on the 12-inch to 16-inch diameter gathering lines where they enter the well pad sites, to facilitate emergency shutdown. All control and safety valves can be actuated via communication with the central compressor facility.

Salt Water Disposal Monitoring and Control

The salt water disposal well will be metered during operations so that the characteristics and performance of the disposal operations may be properly monitored. The injection facilities will be equipped with emergency shutdown systems to close off the flow of water from the surface storage tanks to the injection well facility and under certain conditions (excessive flow, abnormal pressure, etc.) from the wells to the surface storage tanks.

Central Compressor Facility Monitoring and Control Systems

Redundant safety systems will also be installed at the central compressor facility. Gas and fire sensors will monitor all equipment and will automatically shut down the facility if unusual conditions are detected. The facility will be staffed with a day shift only, seven days a week. Operations and maintenance personnel will be on call after the normal working hours to address any abnormal conditions.

Control Room Technology

The heart of the control room are Personal Computers and Programmable Logic Controllers, which provide automation of the control and monitoring functions as well as data collection, recording, and storage. This system will provide continuous monitoring of critical systems parameters and will have the capability for shutdown of either individual areas or the entire operation when specific operating conditions are extreme. The system will be connected to graphic display monitors in the operator's console. One monitor will provide a simplified flow diagram and operating status of the entire system. Another monitor will provide a menu of graphics available to view operating conditions of individual process areas, or specific valve line-up or sequencing required for various operations of the system.

Systems operating parameters that typically will be monitored include flow, temperature and pressure of the gas movement between the PG&E's Line 401, the central compressor site, and the well pad sites. In addition, major valve status or position for pressure control, flow control and emergency shutdown valves on the pipelines and well heads will be indicated and monitored. The presence of gas in the compressor building will also be monitored. A gas chromatograph to monitor gas composition and a calorimeter to measure heating (Btu) values will be provided at the central compressor site. Dew point analyzers will monitor the water content of the gas.

Equipment Operation

From the control room, the operator can provide valve line-up and sequencing for gas movement between PG&E's Line 401, the central compressor site and the well pad sites in addition to storage well selection. The start-up of major pieces of equipment, such as the dehydrators is done manually by an operator from local control panels at the equipment. This assures that the operators regularly inspect the condition and operation of the equipment and facilities prior to and during start up operations.

Facility Inspection and Survey

The regular inspection of the pipelines, equipment, wells, instrumentation, control and support systems is critical to the safe, efficient and economical operation of the Project. Early identification of items in need of maintenance, repair or replacement ensures continued safe operation of the gas storage systems. Written procedures for the operation, inspection, maintenance, and repair of the Project pipelines, equipment and facilities will be established in an Operating and Maintenance Plan as required by the DOT (49 CFR, Part 192, Subparts L and M). The Project will meet or exceed minimum requirements.

Pipeline Inspections

The pipeline will be inspected on a regular basis for ground disturbances along the right-of-way. These ground surveys will include inspection for encroachments and reduced cover, and the condition of vegetation, warning signs, cathodic protection test stations, and piping. A report summarizing the results of the inspections will be prepared and maintained by the operator at the central compressor station.

Well Pad Site Inspections

The well pad sites will be inspected by site personnel at least weekly during no-flow conditions and more frequently during flowing conditions. The inspection will include evidence of vandalism, erosion control, grading and drainage facilities, cathodic protection system, piping, valves, power, site lighting, and well head instrumentation and control equipment. The results of these weekly inspections will be summarized in a monthly report and maintained by the operator at the central compressor site.

Central Compressor Site Inspections

Inspection of the central compressor site and equipment will occur on a daily basis. The operator is responsible for walking the site at the start of each shift and noting the condition of fencing, drainage facilities, tanks and containment, piping, valves, instrumentation and control systems, equipment, site lighting, and buildings. Conditions revealed by the inspections will be included in the operator's daily log and summarized in a monthly report.

The Plant Manager will be notified of any conditions revealed during the inspections that require further inspection, repair, or replacement. Based upon the severity of the condition, the Plant Manager can cause operations to cease or be reduced to a safe level until the condition is corrected.

Maintenance and Repair Procedures

Maintenance of the sites, equipment, facilities and pipelines will be part of the daily operations of the Project. Minimum requirements for maintenance, repair and record keeping of gas pipelines, pressure regulating and relief valves and compressor stations are established by 49 CFR, part 192, subparts L and M, and will be included in the Operating and Maintenance Plan.

Normal maintenance, repair, overhaul, and testing of equipment assemblies and subassemblies would be conducted by site personnel at the maintenance shop located at the central compressor site. Major equipment assemblies and subassemblies that require extensive repair, rebuilding and testing beyond the capabilities of the onsite shop's equipment would be removed from service and shipped off-site for repair at the manufacturer or a qualified service center. During equipment repairs, the Project would either operate at reduced capacity, in only one mode (injection or withdrawal), or be completely out of service. The implementation of scheduled maintenance and refurbishment of the equipment reduces the chances of complete system downtime by scheduling major repairs during non-operational periods.

Scheduled Site Maintenance

Scheduled site maintenance of the central compressor station and the well pad sites includes maintenance of site access roads, drainage facilities, fencing, site lighting, landscaping, equipment, and aboveground piping painting. Site access roads and surface areas will be regraded and resurfaced as often as necessary to maintain a smooth surface, manage dust control, and promote drainage. Regular mowing and periodic clean-out of ditches and culverts will assure that the drainage systems operate at their design capacities. Site fencing will be inspected regularly and repaired as necessary to prevent unauthorized access to Project facilities. All equipment, storage tanks and aboveground piping, valves, and fittings will be painted a flat finish neutral color upon completion of construction and will be repainted regularly. The housekeeping and maintenance procedures employed at the Project will provide a clean work environment and assure that the central compressor site and wellpad sites perform properly while providing a professional appearance. Much of the maintenance work described above will be provided by local service companies.

Parts and Materials

To service and maintain the Project pipelines, equipment, and facilities, an adequate inventory of service, repair, and replacement parts, and materials, will be maintained at the central compressor site in storage space available in or near the generator and maintenance buildings. The service and repair inventory would include items not generally available locally on short notice, such as pipe, valves, fittings, repair and overhaul kits, gaskets, electric motors, pumps, instruments, transmitters, rectifiers, wire, specialty hardware, equipment subassemblies, specialty paints, filters, and lubricants. Maintenance and repair items that can readily be obtained locally, such as fencing, standard hardware, paints, concrete, gravel, and culverts, will not be warehoused on the site.

Electric Power Line

The proposed electric power line would be integrated into PG&E's existing transmission and distribution system. PG&E operations and maintenance personnel would maintain the new power line as a part of their regional transmission and distribution system operations.

3.9 SUMMARY OF DESIGN, CONSTRUCTION AND OPERATIONS COMPLIANCE MEASURES

This section lists several main elements of the Project compliance program, and lists specific design features, construction methods, and operations procedures that will be implemented for the Project. Collectively, these measures are intended to avoid and/or minimize potential safety risks and environmental impacts. These measures are considered part of the Project Description. These measures are referenced in the various impact assessments in Section 4 Environmental Assessment and summarized below.

Following is a partial list of plans and procedures that will be developed as a part of the comprehensive compliance program for construction and operations:

- Emergency Response Plan (Construction and Operations phase)
- Site Security Plan (Construction and Operations phase)
- Hazardous Material Plan (Construction and Operations phase)
- Grading and Drainage Plan (Construction Phase)
- Erosion and Sediment Control (Construction phase)
- Management of trench dewatering and Hydrostatic Test Water (Construction phase)
- Agricultural Impact Mitigation Plan (Construction phase)
- Post Construction Crop Maintenance (Post Construction phase)

- Storm Water Permits (Construction and Operations phase)
- Post Construction Crop Monitoring Plan (Operations phase)

Traffic Control Plan

A Traffic Control Plan will be developed to minimize short-term construction-related impacts on local traffic, and potential traffic safety hazards during Project operations (e.g., during major maintenance and repair procedures). The Plan will include measures such as installation of temporary warning signs at strategic locations near the construction site access locations. The signs will be removed after construction-related activities are completed.

The Traffic Control Plan will include, but not be limited to, the following measures:

- Coordination with Madera County and Fresno County on any temporary lane or road closures, if needed to construct improvements.
- Installation of traffic control devices as specified in Caltrans' "Manual of Traffic Control for Construction and Maintenance Works Zones".
- Provide temporary alternate routes (detours), as necessary, to route local traffic around roadway construction.
- Notify residents in the vicinity of construction any temporary road closures.
- Provide access to driveways, private roads, and farm roads outside the immediate construction zone.
- Consult with emergency service providers and development of an emergency access plan for emergency vehicle access in and adjacent to the construction zone.

Specific measures that will be incorporated into the Project during the construction and operations phases are summarized below.

Construction Staging and Designated Work Zones

Construction work areas will be identified that ensure that:

- Construction activities, equipment, and associated activities (e.g., staging areas) are confined to designated work zones (including access roads), and
- Areas supporting sensitive resources (e.g., off-site but nearby seasonal wetlands and special-status plant population) are avoided.

Before ground-disturbing activities are initiated, work zones will be clearly staked and flagged. Special-status species will be protected and avoided where feasible. All waters and wetland areas will be avoided and will be designated as Project exclusion zones during the

preconstruction phase. Section 4.4 Biological Resources, provides additional recommended measures related to construction staging and work zones.

Underground Utility Plan

Prior to trenching, known pipelines, telephone cables, and other underground structures will be located. All necessary precautions will be taken to protect the underground structures from damage as a result of the construction work. The DigAlert System will be used to identify the foreign underground structures. The owners of all foreign underground structures will be notified in writing of the proposed Project excavation work and will be telephoned again prior to excavating near their facilities. The underground structures will normally be crossed by ditching under them unless the owner of the pipeline(s) allows the natural gas pipeline to be installed over them. The trench will be hand dug in areas in close proximity to existing pipelines. A minimum clearance of 1 foot will be maintained where feasible between such foreign lines or structures and the Project pipeline unless otherwise specified. Where this clearance is not feasible, special procedures will be followed to protect existing structures. Pipe and/or pipe coating damaged by the construction work will be repaired. Special care will be taken to protect other pipelines and coatings in the vicinity of the new pipeline construction.

Where there are existing high priority subsurface installations[2], the requirements of SB 1359 (Chapter 651, Statutes of 2006) will be followed. This law provides a process for identifying and delineating high priority subsurface installations, prior to construction activities occurring near these installations.

Injection Plan

The California Department of Conservation, Division of Oil, Gas and Geothermal Resources (DOGGR) is responsible for wells drilled into an underground gas storage facility. The Applicants will submit for approval, the necessary Notice of Intention forms to drill, rework, redrill or plug and abandon wells as required. In addition, the Applicants will complete engineering and geology studies and an injection plan and submit them to the DOGGR for approval. These studies will meet the DOGGR appropriate requirements and describe the planned well drilling and abandonment program; reservoir characteristics; casing diagrams; all geologic units, aquifers, and oil and gas zones; and include an isopach map of each injection zone, a geologic cross section through an injection well; and an injection plan that includes a map showing the injection facilities, anticipated injection pressures and rates, and a description of the monitoring system to ensure that injected gas is confined to the intended zone. All required data will be submitted to the district deputy. A bond will be posted with DOGGR to ensure proper completion or abandonment of any well drilled.

[2] High priority subsurface installations are defined by Government Code Section 4416(d) as high-pressure natural gas pipelines with normal operating pressures greater than 60 psig or greater than 6 inches nominal pipe diameter, petroleum pipelines, pressurized sewage pipelines, high-voltage transmission lines, conductors, or cables equal to or greater than 60kV, or hazardous materials pipelines that are potentially hazardous to workers or the public if damaged.

Seismic-Resistant Design Measures

The Project will be designed to meet the seismic safety standards of the California Building Code. Specific design measures may include, but are not limited to, special foundation design, additional bracing and support of upright facilities, and weighting the pipeline in areas of potential liquefaction. In addition, automated leak detection, isolation, and shutdown controls will limit the secondary effects of equipment damage. Project facilities and foundations will be designed to withstand changes in soil density. Additional information related to seismic design is provided in Section 4.6 Geology, Soils, and Paleontology.

Air Quality Protection Measures

An Authority to Construct (ATC) will be obtained from the APCD and provided to the CPUC prior to construction. Several measures will be implemented during construction to minimize dust and other emissions consistent with APCD guidelines. Construction emissions will be minimized through the use of all feasible construction dust control measures, as specified in the SJVAPCD "Guide for Assessing and Mitigating Air Quality Impacts." Further description of construction Air Quality Protection Measures is in Section 4.2, Air Quality.

Prior to operation of the compressor facility, a Permit to Operate will be obtained from the APCD. The compressor station equipment will be electrically powered, which will reduce emissions compared to gas-fired compressor equipment. Best Available Control Technology (BACT) will also be used to reduce emissions from the compressor units and auxiliary equipment. BACT measures are described in Section 4.3 Air Quality.

Noise Control Plan

Construction will comply with applicable Fresno and Madera County (local) noise regulations. Construction will typically occur during daytime hours weekdays and Saturdays. In cases where nighttime construction will be necessary (e.g. during well drilling), it will comply with applicable nighttime noise standards. Specific construction noise control measures are discussed in Section 4.11 Noise. An acoustical engineer will measure actual sound levels at receptor sites and design sound abatement features, if necessary, to ensure that long-term operations meet or exceed the local ordinance limits. Additional design features could include use of quieter equipment or further insulation of noise-generating equipment. Project traffic use designated truck routes to the extent feasible to avoid excess vibration

The following design features will be implemented to reduce and control noise generated from operations equipment:

- Install electric motor drivers rather than internal combustion engines wherever practical;
- Uniform distribution of noise from heat exchangers by selection of vertical air flow orientation;

- Minimize heat exchanger noise levels by selecting equipment with increased surface area but reduced fan speeds; and
- Enclose reciprocating compressors within buildings.

Additionally, planned equipment blowdowns will be scheduled during normal daylight hours.

Water Conservation Measures and Solid Waste Minimization Measures

Water Conservation and solid waste minimization measures for the Project will include:

- Low flow toilets
- Solid waste recycling and reuse to the extent possible

Equipment Maintenance and Refueling Restrictions

Construction equipment will require periodic maintenance and refueling. To reduce the potential of contamination by spills, no refueling, storage, servicing, or maintenance of equipment will be performed within 100 feet of sensitive environmental resources. No refueling or servicing will be done without absorbent material or drip pans underneath to contain spilled fuel.

Any fluids drained from machinery during servicing will be collected in leakproof containers and taken to an appropriate disposal or recycling facility. If such activities result in spillage or accumulation of a product on the soil, the contaminated soil will be assessed and disposed of properly. Under no circumstances will contaminated soils be added to a spoils pile.

Mobile refueling trucks likely will be used for onsite refueling of construction equipment. The refueling trucks will be independently licensed and regulated to haul and dispense fuels, to ensure that the appropriate spill prevention techniques are implemented.

All maintenance materials (i.e., oils, grease, lubricants, antifreeze, and similar materials) will be stored at designated staging areas. If these materials are required during field operations, they will be placed in a designated area away from site activities and sensitive resources.

During construction, all vehicles and equipment required on site will be parked or stored at least 100 feet from waterbodies, wetlands, known archaeological sites, and other sensitive resource areas. These areas will be identified on the construction drawings, as appropriate. All wash-down activities will be conducted at least 100 feet from sensitive environmental resources.

Equipment maintenance and refueling procedures during operations are similar to those described above. Equipment maintenance and refueling measures during operations include:

- Fluids drained for maintenance will be either transferred directly into disposal trucks for immediate transportation or will be temporarily stored in appropriate tanks on site until regularly scheduled trucks can load out.

- Used fluids removed from site will be delivered to an appropriate disposal or recycling facility.

- Disposal and delivery trucks will be independently licensed and regulated to haul and dispense the specific fluids, to ensure that the appropriate spill prevention techniques are implemented.

- In some instances new fluids will be stored onsite for regular use or for fluid changes as part of scheduled maintenance.

- Equipment requiring regular fluid changes and those at risk for leakage over a period of use will be equipped with drip pans or other appropriate containment.

- If such activities result in spillage or accumulation of a product on the soil, the contaminated soil will be assessed and disposed of properly.

- Storage tanks for both new and used fluids will be installed with secondary containment, either integral to the tanks or external.

Hazardous Materials Measures

The following measures will be incorporated into the construction contract specifications to address hazardous materials generated from construction-related activities.

- Diesel fuel and petroleum-based lubricants will be stored only at designated staging areas.

- All hazardous material spills or threatened releases, including those of petroleum products such as gasoline, diesel, and hydraulic fluid, regardless of the quantity spilled, will be immediately reported if the spill has entered or threatens to enter a water of the state, or has caused injury to a person or threatens injury to public health.

- A Hazardous Materials Contingency Plan will be implemented if an accidental spill occurs or if any subsurface hazardous materials are encountered during construction. Provisions outlined in this plan will include phone numbers of county and state agencies and primary, secondary, and final cleanup procedures.

Buried hazardous materials may be encountered during construction. Generally the materials would be identified visually or by the detection of an odor. If such materials are encountered, several standard procedures will be implemented, including:

- Identification of contaminated soils or water

- Remedial Action
- Training and Site Security
- Notification Procedures
- Storage, Removal, and Disposal.

Project contractors will prepare a Health and Safety Plan (HSP) to ensure that no impacts will occur if hazardous soils or other materials are encountered during construction or operation of the Project. The HSP will include elements that establish worker training, engineering controls, and monitoring. The HSP also will establish security measures to prevent unauthorized entry to cleanup sites and to reduce hazards outside the investigation/cleanup area.

Fire Management Measures

The Applicants recognize the potential for increased fire risk during summer construction activities and will develop fire management measures as part of their construction safety and emergency response plan for use during construction and operation. The plan will include notification procedures and emergency fire precautions, such as the following:

- All internal combustion engines, stationary and mobile, shall be equipped with spark arresters, meeting applicable regulatory standards.
- Spark arresters shall be in good working order.
- Light trucks and cars with factory-installed (type) mufflers, in good condition, may be used on roads where the roadway is cleared of all vegetation.
- "No Smoking" signs and fire rules shall be posted on the Project bulletin board at the all contractor field offices and areas visible to employees during the fire season.
- Equipment parking areas and small stationary engine sites shall be cleared of all extraneous flammable materials.
- Installation of fire extinguishers at the compressor station and metering station.
- Employee training in use of extinguishers and communication with the Madera County Fire Department.
- Periodic inspections by the Madera County Fire Department.

Biological Resources Protection Measures

Section 4.4 Biological Resources, provides several general and site-specific measures related to wildlife protection during construction and operations. Section 4.4, Biological Resources,

describes several key elements of biological resources protection measures. Project-specific Mitigation Measures will be addressed in a Biological Resources Mitigation and Monitoring Plan (BRMIMP). The BRMIMP will include, but not be limited to, species impact avoidance and minimization measures, a habitat conservation strategy, environmental compliance reporting requirements, pre-construction survey methods, construction monitoring procedures, a Worker Environmental Awareness Program, a frac-out contingency plan, and post-construction restoration plans.

Frac-Out Contingency Plan

A site-specific Frac-Out Contingency Plan will be developed as part of the bore plans in order to protect water quality and aquatic habitats during HDD procedures. This plan will focus on minimizing the potential for a frac-out associated with tunneling activities; providing for the timely detection of frac-outs; and ensuring an organized, timely, and "minimum-impact" response in the event of a frac-out and release of drilling lubricant (i.e., bentonite). Specific measures of the Frac-Out Contingency Plan are discussed in Section 4.8 Hydrology and Water Quality.

Cultural Resources Measures

A cultural resources discovery and management plan will be developed and implemented to avoid potential impacts to previously undiscovered cultural resources. This plan will include review of final construction plans to determine which portions of the Project may affect prehistoric cultural resources; worker training in the identification of potential cultural artifacts; and appropriate notification and handling procedures. Section 4.5, Cultural Resources, provides additional site-specific measures related to protection of cultural and historic resources.

Paleontological Resources Measures

A paleontological resources discovery and management plan will be developed and implemented to avoid potential impacts on these resources. This plan will include review of final construction plans to determine which portions of the Project may affect paleontologically sensitive sediments that lie deeper than 10 feet below the surface; worker training in the identification of potential cultural artifacts; and appropriate notification and handling procedures.

If potentially significant fossils (defined as deposits that are unique, or that may reasonably be expected to assist in the evaluation of specific areas of research or expand our understanding of prehistory) are encountered, construction will be stopped in the immediate vicinity of the fossil find until they are removed; and recovery and curation of fossils by a qualified paleontologist will be arranged.

Aesthetics/Visual Resources Measures

The following measures will be implemented to minimize potential visual impacts of the Project:

- Construction disturbances and vegetation clearing will be limited to only the area necessary; this will help reduce any noticeable contrast between exposed soils and naturally vegetated areas; and, clearing of vegetation at facilities sites will be minimized.

- Facilities will be painted with non-glare, earth tone colors to blend with the surrounding landscape.

- Shielded, non-glare lighting will be used at facilities, and lighting fixtures will be limited to that required to maintain site security and safe operations.

Site Restoration Measures

Following installation of the pipeline, the right-of-way will be graded to preconstruction grades and contours and will be seeded with an appropriate seed mix. The seed mix will be composed of the appropriate mix of species and acceptable to the landowner. In agricultural areas, the Applicant will work with the landowner to facilitate the return of pre-disturbance agricultural operations to the ROW. Section 4.4 Biological Resources, provides additional recommended mitigation measures related to site restoration in native areas. Site restoration within agricultural areas will be further addressed in the Agricultural Impact Mitigation Plan discussed below.

Agricultural Impact Mitigation Plan

In agricultural areas, the Applicants will work with landowners to minimize disruption to agricultural operations during construction and to facilitate the return of pre-disturbance agricultural operations to the right-of-way. The specific provisions of a preliminary Agricultural Impact Mitigation Plan are discussed in Section 4.9 Land Use, Planning and Agriculture, and the preliminary plan is provided in Appendix B.6. The Agricultural Impact Mitigation Plan will be refined and finalized when acreages and crop types have been identified.

Post Construction Crop Maintenance Plan

In agricultural areas, the Applicants will work with landowners to minimize disruption of agricultural crop yields after construction, and to facilitate the return of pre-disturbance agricultural crop yields along the ROW. The specific provisions of a preliminary Post Construction Crop Monitoring Plan are discussed in Section 4.9, Land Use, Planning, and Agriculture; the preliminary plan is provided in Appendix B.6. The preliminary plan will be refined and finalized when acreages and crop types have been identified.

Agricultural and Land Conservation

To offset the conversion of agricultural land to non agricultural use, the Applicants will participate in the land conservation programs that are currently being developed in Fresno and Madera counties. Madera County's program will create permanent conservation easements to preserve agricultural land and native habitat. The County will manage the program and the easements. The Applicants will pay fees into the conservation program to permanently preserve an appropriate quantity of land to fully mitigate Project impacts. Fresno County is developing a

similar program that will be administered by a qualified land trust. These programs are discussed in Section 4.9, Land Use Planning, Agriculture and Recreation.

Erosion and Sediment Control Plan

Erosion and sediment control measures are used to reduce the amount of soil that is displaced or transported from a land area and to control the discharge of soil particles that are displaced or transported. The following standard erosion and sediment control measures and practices will be used during and after construction to control accelerated soil erosion and sedimentation:

- Minimize site disturbance.
- Perform initial cleanup.
- Compact subsurface backfill material.
- Apply an appropriate seed mix.

These measures are described below and are routinely implemented in the construction industry. They have been successful for projects involving surface and subsurface disturbances similar to those proposed in connection with the Project. Section 4.8, Hydrology and Water Quality, provides additional measures related to construction staging and work zones.

Minimize Site Disturbance. The most basic way to avoid erosion is to minimize site disturbance. To minimize site construction contractor will be directed to:

- Remove only the vegetation that it is absolutely necessary to remove,
- Avoid off-road vehicle use outside the work zone,
- Avoid excessive trips along the ROW or access or public roads, and
- Instruct all personnel on storm water pollution prevention concepts to ensure that all are conscious of how their actions affect the potential for erosion and sedimentation.

Construction inspectors will be on site during all construction activities and will reinforce the importance of confining all vehicular traffic to the existing right-of-way and public access roads.

Perform Initial Cleanup. The contractor will be directed to perform initial site cleanup immediately following construction activities. Initial cleanup includes removing debris and spoils and restoring original contours. Initial cleanup conducted as part of the construction contributes significantly to overall site stability and facilitates final cleanup. The site will begin to stabilize naturally with little additional disturbance during final cleanup. A site that is not initially cleaned up is more susceptible to erosion.

Compact Subsurface Backfill Material. Proper compaction of subsurface soil serves as an erosion control measure. Uncompacted plow or trench furrows are susceptible to subsurface erosion through the migration of surface and subsurface water. Proper compaction of the subsurface material and plow furrows is necessary to help prevent surface and subsurface migration of water along the plow or trench furrow, and to prevent trench settlement.

Apply an Appropriate Seed Mix. Seeding consists of sowing soil-stabilizing grasses on areas disturbed by construction activities—except cropland and areas surfaced with pavement or gravel. Vegetation serves to control both erosion and sedimentation. The root structure of the vegetation holds soil in place to resist erosion. Grasses slow the flow of surface water, allowing suspended particles to settle. All disturbed areas will be reseeded immediately after construction activities are completed. Reseeding will use species that are appropriate to the site and acceptable to the landowner.

Apply Cover Rock. Install and compact aggregate material in permanent construction areas to control erosion and reduce dust. Cover rock not to be used in cropland or where seed mix is applied.

3.10 REQUIRED PERMITS AND PLANS

Other regulatory agencies that may be responsible for issuing permits and approvals in connection with the Project are identified in Table 3.10-1 below.

Table 3.10-1: Agency Approvals

Other Project Approvals	Issuing Agency	Purpose/ Covered Activity
1. Federal		
a. Clean Water Act Section 404/Rivers and Harbors Act Section 10: Nationwide Permit (NWP) 12	U.S. Army Corps of Engineers	Utility line activities in waters of the U.S.
b. Section 7 Consultation (in connection with NWP 12): Incidental Take Permit	U.S. Fish and Wildlife Service	Endangered Species Act compliance
d. NHPA Section 106 Consultation (in connection with NWP 12): Memorandum of Agreement	State Historic Preservation Officer	Compliance with National Historic Preservation Act.
2. State		
a. Water Quality Certification (required as condition of NWP 12)	Central Valley Regional Water Quality Control Board	Compliance with water quality standards and plans
b. Notice of Intent to Comply with General Order No. 5-00-175 (or its replacement) for Dewatering and Other Low Threat Discharges	State Water Resources Control Board	Construction activities and discharge of hydrotest water
c. General Lease/Right of Way Use	State Lands Commission	Pipeline river crossing
d. Permits to Conduct Well Operations	Division of Oil and Gas	Well drilling and operation
e. Authorization to Inject Produced Water	Division of Oil and Gas	Injection well drilling and operation
f. Encroachment Permits	Department of Transportation	Pipeline highway crossings
g. PRC Section 1601 Streambed Alteration Agreement	Department of Fish and Game	Pipeline river crossing
i. Authority to Construct/Permit to Operate	San Joaquin Valley Air Pollution Control District	Compressor emissions
j. National Pollutant Discharge Elimination System General Permit for Discharge of Construction Related Storm Water[3]	State Water Resources Control Board	Management of storm water during construction
3. Local (Ministerial)		
a. Building and Occupancy Permits	Madera County	Compressor site facilities
b. Grading Permit	Madera County	Compressor site improvement
d. Well Permits	Madera County / Fresno County	Injection and withdrawal wells, observation wells, injection well
e. Encroachment/Other Permits	Madera County / Fresno County	Road crossings
g. Domestic Well Permit	Madera County	Compressor site domestic water supply

[3] Under a rule issued in 2006, the United States Environmental Protection Agency (USEPA's) exempted most oil and gas activities from the requirement to obtain a construction stormwater permit. In May 2008, the Ninth Circuit invalidated USEPA's rule.