

2.0 PROJECT DESCRIPTION

2.1 NEED FOR PROJECT

Line 114, Line 114-1, and Line SP4Z (pipelines) cross under the San Joaquin River between Sherman Island and the city of Oakley (City) (Figure 2-1). The pipelines and supporting facilities were constructed in 1942. All three pipelines served as gas transmission pipelines transporting natural gas to consumers in Contra Costa County.

In 1999, approximately 647 feet of the terrestrial portion of Line 114 on Sherman Island, upstream of the north landing's reinforced concrete valve pit on Sherman Island levee, was filled with cement slurry, cut, capped, and decommissioned. In 2006, the pipelines were deactivated. In 2012, the Line SP4Z pipeline segment upstream of the north landing's reinforced concrete valve pit was cut and capped, but was not filled with cement slurry. The three submarine pipeline segments and the south landing's terrestrial pipeline segments are intact and currently filled with pressurized natural gas. A summary of pipeline specifications is provided in Table 2-1 (Pipeline Overview).

Table 2-1. Pipeline Overview

Line	Specifications		Current Status
	Pipeline (inches)	Wall Thickness (inches)	
114	16 at north landing, reduced to 12 across river	16 onshore = 0.520 12 crossing = 0.438	Cement Slurry Plug at North landing. Capped and Intact, filled with pressurized natural gas.
114-1	12	12 onshore = 0.375 12 crossing = 0.438	Filled with pressurized natural gas.
SP4Z	12	12 onshore = 0.375 12 crossing = 0.438	Capped and Intact, filled with pressurized natural gas.

In 2005/2006, underwater and diver surveys (Fugro 2006) revealed that the three pipelines are exposed on the riverbed and suspended over the Stockton Deep Water Channel near the north landing of the crossing (offshore Sherman Island). Span lengths were noted up to approximately 125 feet and elevated as much as approximately 6 feet above the riverbed. Follow up surveys in 2014 (Fugro 2014) confirmed these findings and found that additional segments of the pipeline were exposed on the northern riverbed.

PG&E intends to decommission and largely remove these three deactivated pipelines. All exposed portions would be removed along with buried portions within the riverbed. The north landing terrestrial and shoreline pipeline segments (buried under the waterside slope of the Sherman Island levee) and the south landing terrestrial and shoreline segments would be filled with cement slurry and abandoned in place.

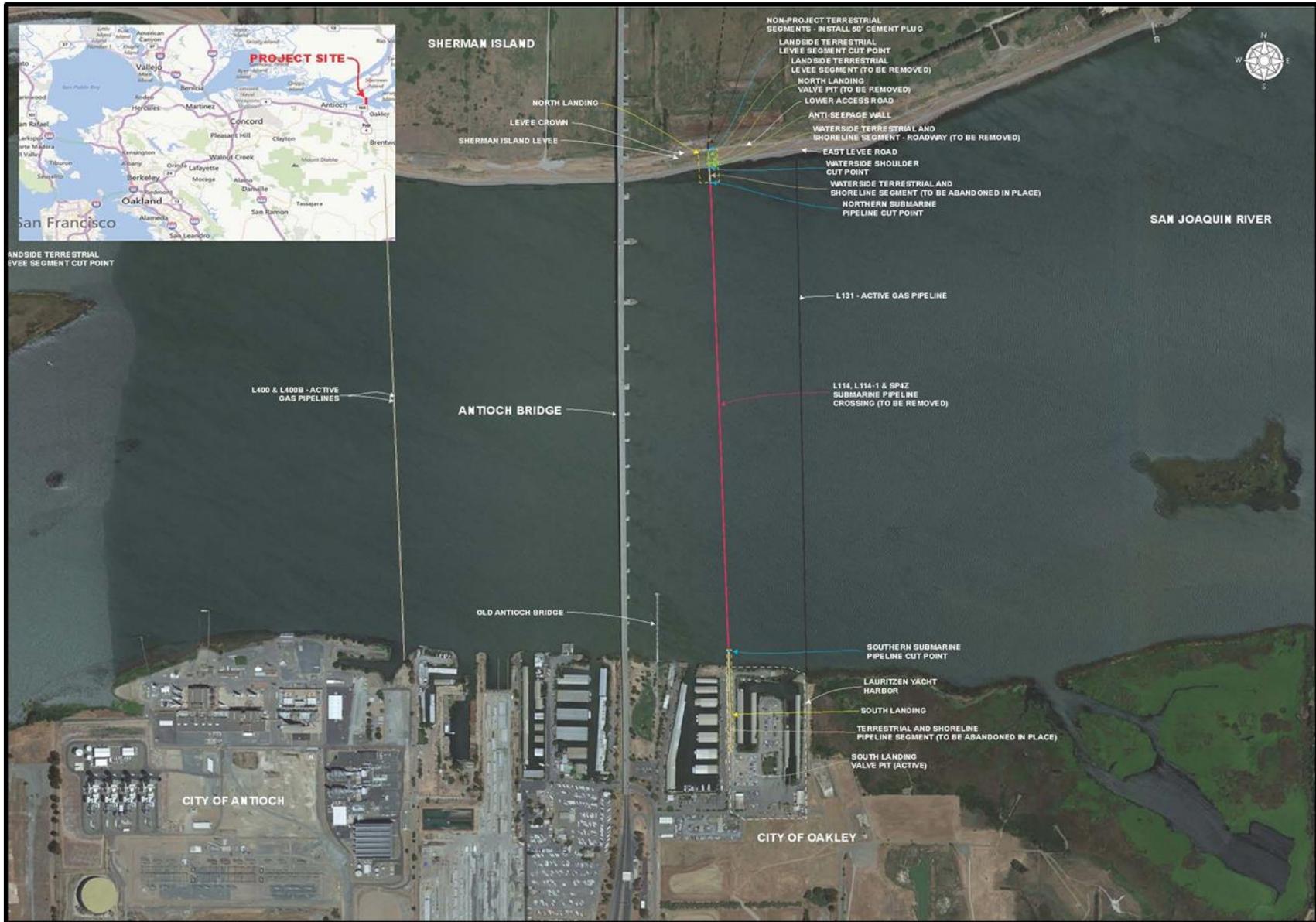


Figure 2-1. Project Site Map – Overview

1 2.2 PROJECT COMPONENTS

2 The proposed Project involves the decommissioning of three submarine pipelines (Line
3 114, Line 114-1, and Line SP4Z), the associated northern valve pit at Sherman Island,
4 and navigational hazard signs at the northern and southern landings that would no
5 longer be necessary after the pipelines have been removed. The Project would
6 encompass three separate work sites (the north landing work site, the south landing
7 work site and the pipeline crossing of the San Joaquin River underwater work site) as
8 further described below. These activities would be supported by an offsite shore base
9 (see Section 2.2.4 below). The proposed areas of disturbance to complete the Project
10 activities are summarized below (Table 2-2).

Table 2-2. Summary of Proposed Areas of Disturbance

Location	Dimensions	Square Footage	Acreage
North Landing	100 feet x 122 feet	12,200	0.280
Pipeline Crossing - Underwater Work Site	3,519 feet x 12 feet	42,228	0.970
South Landing	3 feet x 9 feet	27	0.001

11 2.2.1 North Landing at Sherman Island

12 At the start of the work at the north landing, the valve pit would be opened and cement
13 slurry plugs would be placed in each of the three pipeline segments from the valve pit
14 south, passing underneath the levee crown, down the waterside levee slope and under
15 the riverbed, an overall length of approximately 285 feet each (see Figure 2-2). These
16 cement slurry plugs in the submarine pipeline segment landings would terminate
17 approximately 50 feet south of the northern submarine pipeline cut points located
18 approximately 180 feet offshore of the Sherman Island shoreline. Once the three
19 submarine pipeline landing segments have been filled with cement slurry plugs, the
20 levee crown would be excavated between the north landing valve pit and the waterside
21 shoulder of the levee crown, an overall distance of approximately 27 feet. The three
22 pipeline segments would be cut at the waterside shoulder of the levee crown (waterside
23 shoulder cut point) and all three pipelines would be removed between the waterside
24 shoulder cut point and the valve pit. The 12-foot-long reinforced concrete anti-seepage
25 wall embedded in the levee crown (through which the three pipeline segments pass)
26 would also be removed.

27 At the lower access road, approximately 15 feet north of the toe of the Sherman Island
28 levee, all three pipeline segments would be excavated and cut at a point where they
29 pass under this road (Figure 2-3). This cut point has been designated the landside
30 terrestrial levee segment cut point. Cement slurry plugs (approximately 50 feet long)
31 would be placed in Lines 114-1 and SP4Z from the landside terrestrial levee segment
32 cut point north.

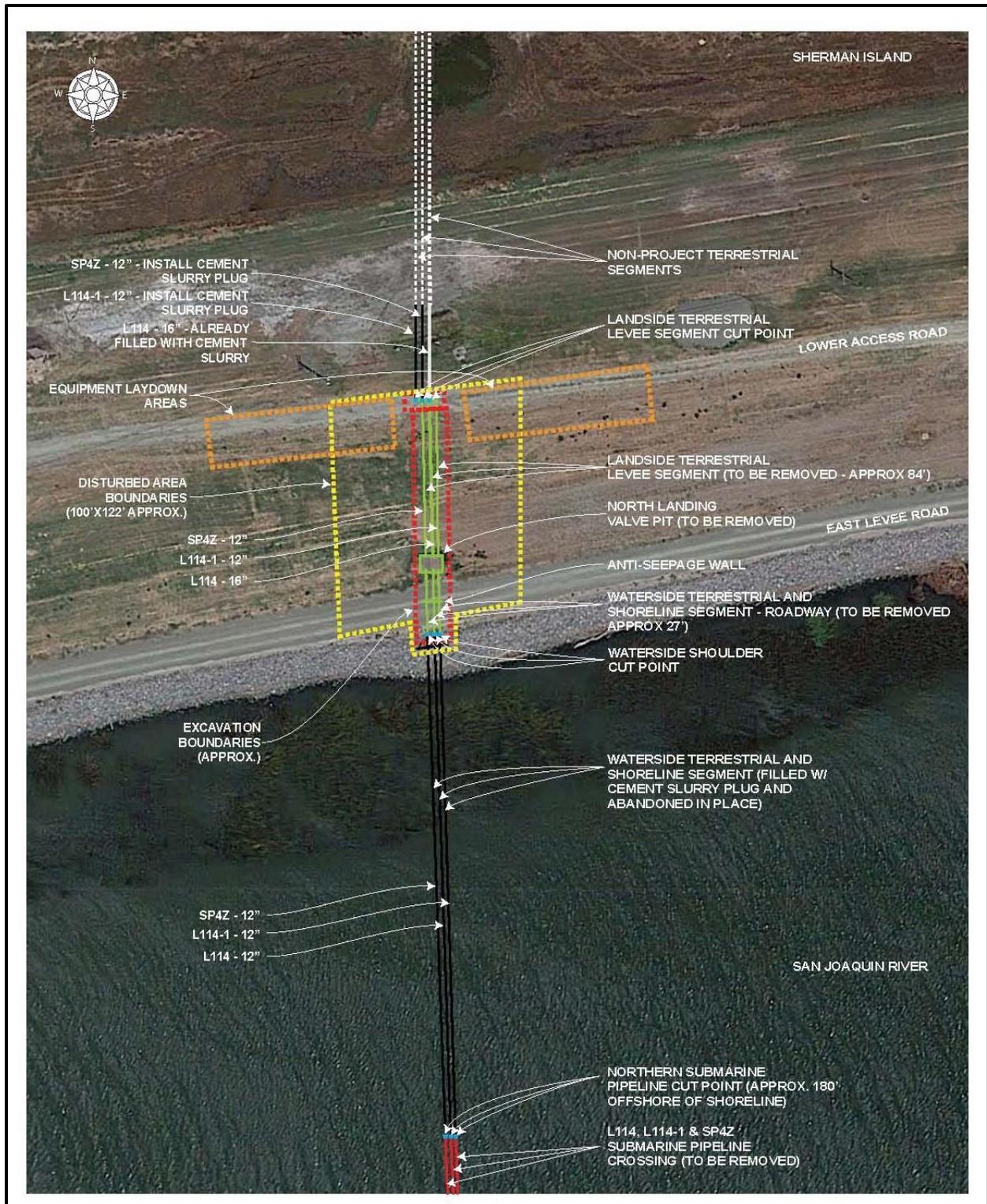


Figure 2-2. North Landing Areas of Disturbance

<p>MARINE NAVIGATION SAFETY SIGN (TO BE REMOVED)</p> <p>SAN JOAQUIN RIVER</p>		<p>ANTIOCH BRIDGE</p> <p>LEVEE CROWN</p> <p>LEVEE WATERSIDE SHOULDER AND CUT POINT</p> <p>LEVEE LANDSIDE SHOULDER</p>	<p>Sherman Island Levee Road at North Landing</p>
<p>NORTH LANDING VALVE PIT</p> <p>LOWER ACCESS ROAD</p>		<p>LEVEE CROWN</p>	<p>Valve Pit at North Landing</p>
<p>LANDSIDE TERRESTRIAL LEVEE SEGMENT CUT POINT</p> <p>TOE OF LEVEE SLOPE</p>		<p>LOWER ACCESS ROAD</p>	<p>Landside Terrestrial Segment Cut Point</p>

Figure 2-3. North Landing Photographs

1 Line 114 was previously filled with a cement slurry plug at this location. Once Line 114-1
2 and SP4Z have been plugged, all three pipeline segments between the landside
3 terrestrial levee segment cut point and the north landing valve pit would be excavated
4 and removed, a total distance of approximately 84 feet. According to PG&E survey
5 information, burial depths of the terrestrial pipeline segments are 3 to 10 feet. Except for
6 the installation of the cement slurry plugs in Line 114-1 and Line SP4Z, and capping of
7 all three pipelines at the north landing's landside terrestrial levee segment cut point, the
8 decommissioning of the terrestrial segments of these pipelines north of the north
9 landing's landside terrestrial levee segment cut point is not included in this Project.

10 The north landing valve pit consists of a reinforced concrete cast-in-place vault that
11 measures (outside dimensions) approximately 8.5 feet deep, 12.3 feet wide, and 6.75
12 feet high (at the landside wall), with a wall thickness of approximately 8 inches (Figure
13 2-3). It has a reinforced concrete floor of the same approximate thickness and may
14 incorporate a floor drain and sump for draining rainwater into the surrounding soil from
15 the valve pit. PG&E is proposing to demolish and remove the entire valve pit, piping and
16 appurtenances. The north landing valve pit excavation would be backfilled and matched
17 with existing levee slope with native soil acceptable to the Central Valley Flood
18 Protection Board (CVFPB)/Reclamation District (RD) 341 and compacted to CVFPB/RD
19 341 requirements and the vegetation restored to pre-decommissioning conditions.

20 A PG&E marine navigation safety sign (see Figure 2-3) is located on the waterside
21 slope of the Sherman Island levee over the three pipeline alignments. The purpose of
22 the sign is to warn boaters and ship operators of the presence of the pipeline crossings.
23 This is an approximately 8 foot by 12 foot wooden sign set on three 4 inch by 4 inch
24 lumber posts, and three 2 inch by 8 inch lumber braces. This sign would be removed
25 after the pipelines are decommissioned as it would no longer be necessary.

26 **2.2.2 South Landing at Lauritzen Yacht Harbor**

27 The three pipelines come ashore at the Lauritzen Yacht Harbor and travel underground
28 to the reinforced concrete valve pit located in the ground at the western boundary of the
29 Lauritzen Yacht Harbor (Figures 2-4 and 2-5). The burial depth of the south landing's
30 terrestrial and shoreline pipeline segment is approximately 5 feet under the riverbed as
31 it comes ashore and 7 feet below ground surface between the shoreline and the
32 southern valve pit. The horizontal length of each south landing terrestrial and shoreline
33 pipeline segment is 731 feet, as measured from the southern submarine pipeline cut
34 point to the north wall of the south landing's valve pit at Lauritzen Yacht Harbor.

35 The overall south landing work site boundaries measure approximately 601 feet by 50
36 feet. With the exception of the marine safety sign removal on the south shoreline, there
37 is no disturbed area at this work site because no excavation would be required and all
38 equipment would be confined to existing roadways within the Lauritzen Yacht Harbor.

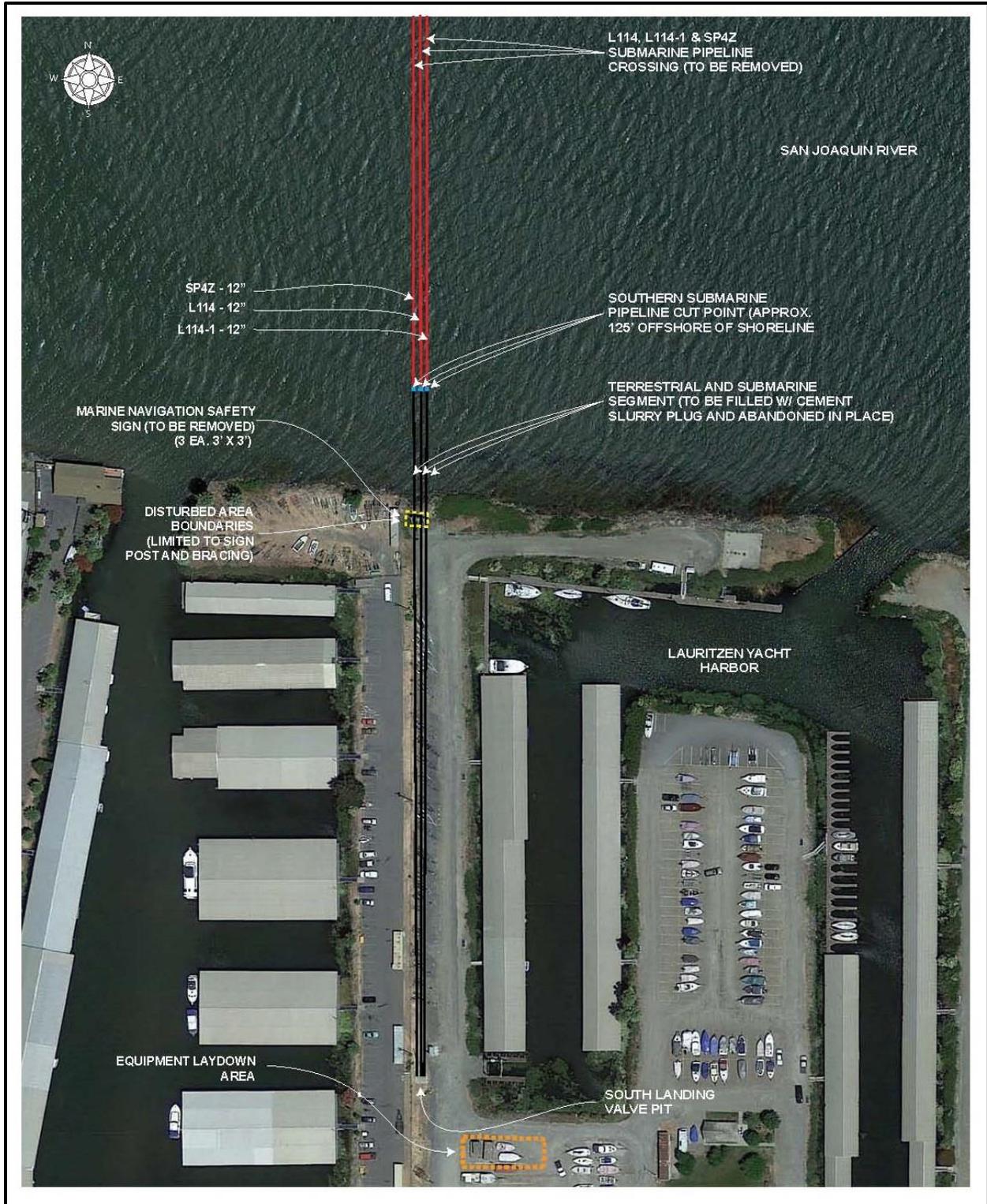


Figure 2-4. South Landing Areas of Disturbance



Figure 2-5. South Landing Photographs

- 1 The valve pit at the southern landing is not currently scheduled for decommissioning.
- 2 The three pipelines have been disconnected inside the south landing valve pit,
- 3 separating the submarine segments from their respective terrestrial pipelines that exit
- 4 the south side of the valve pit. This south landing valve pit and the three terrestrial
- 5 pipeline segments would be decommissioned by PG&E in the future (Figure 2-5).

- 6 A PG&E marine navigation safety sign is located on the shoreline of the south landing
- 7 approximately over the three pipeline alignments (see Figure 2-5). The purpose of the
- 8 sign is to warn boaters and ship operators of the presence of the pipeline crossings.
- 9 This is an approximately 8 foot by 12 foot wooden sign set on three 4 inch by 4 inch

1 lumber posts and three 2 inch by 8 inch lumber braces. This sign would be removed
2 after the pipelines are decommissioned as it would no longer be necessary.

3 **2.2.3 Pipeline Crossings - San Joaquin River**

4 The submarine pipeline crossing segments within the underwater work sites:

- 5 • start at the northern submarine pipeline cut point located approximately 180 feet
6 offshore of the northern shoreline of the San Joaquin River;
- 7 • run to the predesignated southern submarine pipeline cut point located
8 approximately 130 feet offshore of the southern shoreline of the river; and
- 9 • are each approximately 3,519 feet in total horizontal length as measured from the
10 northern to the southern submarine pipeline cut points.

11 The primary temporarily disturbed area within the underwater work site would consist of
12 the excavations required to remove the submarine pipelines. This excavation corridor
13 (or removal corridor if excavation is not required) is approximately 3,519 feet long by 12
14 feet wide (8 feet wide between Line 114-1 and Line SP4Z, plus 2 feet either side of
15 these bordering pipelines), which equals an underwater disturbed area of approximately
16 42,228 square feet or 0.97 acre (Figure 2-6). Anchors used to moor the supporting
17 derrick barge represent a second source of riverbed disturbance, but no excavation is
18 required with their use and their impact is minimal (less than 78 square feet per anchor,
19 assuming a disturbed area approximately 10 feet in diameter).

20 According to PG&E as-built drawings, the pipeline materials for all three pipeline
21 segments consists of API-5L Grade B seamless steel pipe with an outside diameter of
22 12.75 inches and a wall thickness of 0.438 inch. The pipelines are coated with an
23 external Somastic anti-corrosive and weight coating of unknown thickness, but assumed
24 to be approximately 1 inch thick. Also, according to as-built drawings and past survey
25 information, the three submarine pipelines may be bundled together or touching through
26 portions of the crossing, but may also be separated by several feet through other
27 portions of the crossing. The as-built drawings show Line 114-1 to be the easterly
28 pipeline, Line 114 located approximately 3 feet to the west of Line 114-1 (centerline to
29 centerline), and Line SP4Z located approximately 5 feet west of Line 114 (centerline to
30 centerline). However, significant as-found deviations in apparent alignment spreads can
31 be expected due to the difficulties inherent in constructing these submarine crossings in
32 a river environment with extreme water currents. The exact horizontal and vertical
33 locations of these three pipeline segments are unknown as they are buried under the
34 riverbed and their locations have not been positively identified.

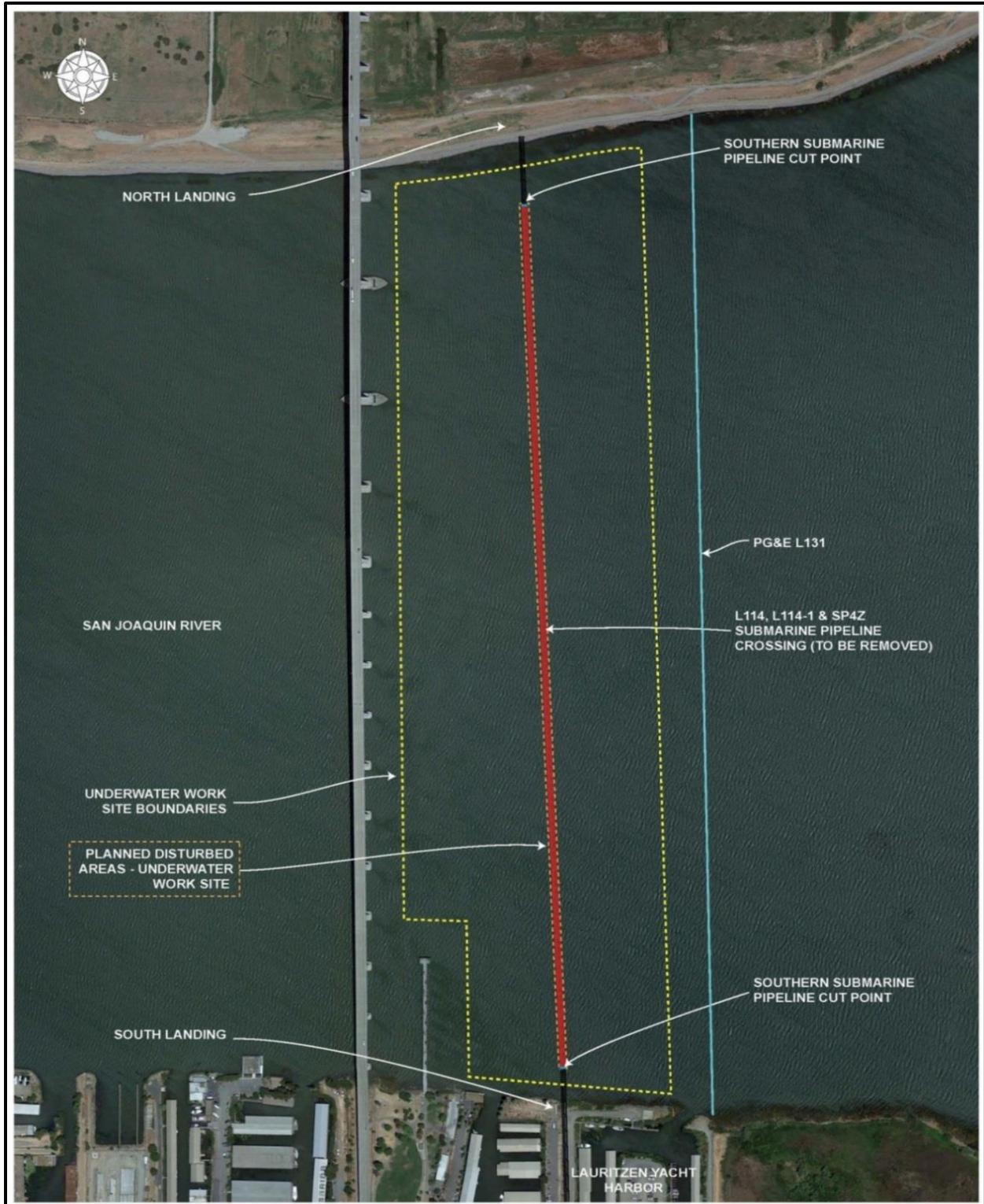


Figure 2-6. San Joaquin River - Pipeline Crossing Area of Disturbance

1 According to PG&E survey information, the maximum burial depth of the river crossings
2 segments between the northern and the southern submarine pipeline cut points is
3 approximately 10 feet. The average burial depth of the submarine pipeline crossings is
4 approximately 5.5 feet. The maximum water depth of the crossing is approximately 40
5 feet (based on vertical datum, North American Datum of 1988 [NAVD88]).

6 **2.2.4 Shore Base**

7 An offsite shore base would be required to mobilize marine equipment and offload
8 recovered submarine pipeline materials. This base would consist of dockside facilities
9 with paved roadways where marine equipment would be mobilized and demobilized and
10 where the recovered pipeline materials would be offloaded from a materials barge and
11 loaded on to trucks for transportation to approved recycling or landfill facilities. The
12 offsite shore base location would be selected by the decommissioning contractor and its
13 location and facility description would be included in the Contractor Work Plan that
14 would be developed by the decommissioning contractor and approved by the California
15 State Lands Commission (CSLC) staff prior to the start of the decommissioning site
16 work. For the purposes of the Project Execution Plan (PEP) and Mitigated Negative
17 Declaration, the offsite shore base is assumed to be Mare Island in Solano County, a
18 distance of approximately 30 miles from the offshore Project site in an industrially-
19 developed area (Figure 2-7).

20 **2.3 CONSTRUCTION PROCEDURES**

21 **2.3.1 North Landing at Sherman Island**

22 The onsite decommissioning activities would start with the work at the north landing
23 (refer to Figure 2-2). The following steps would be taken to decommission the pipelines,
24 valve pit, and navigation sign in this location. A brief description of these steps is
25 provided below. For full construction procedures, please refer to the PEP (included
26 within Appendix A).

- 27 • Waterside Terrestrial and Shoreline Segment Cementing Operations (Section
28 2.3.1.1).
- 29 • Landside Terrestrial Levee Segment Cementing Operation (Section 2.3.1.2).
- 30 • Landside Terrestrial Levee Segment Removal (Section 2.3.1.3).
- 31 • Waterside Terrestrial and Shoreline Segment Roadway Removal (Section
32 2.3.1.4).
- 33 • Valve Pit Demolition and Removal (Section 2.3.1.5).
- 34 • Marine Navigation Safety Sign Removal (Section 2.3.1.6).
- 35 • Site Restoration (Section 2.3.1.7).



Figure 2-7. Tentative Shore Base Location

1 2.3.1.1 Waterside Terrestrial and Shoreline Segment Cementing Operations

2 Cement slurry plugs would be installed in the north landing's waterside terrestrial and
3 shoreline pipeline segments (from the north landing valve pit to the northern submarine
4 pipeline cut point). The plugs shall be installed to a point in each of the three pipelines
5 approximately 50 feet south of the planned northern submarine pipeline cut point, a
6 horizontal distance of approximately 285 feet south of the south wall of the north landing
7 valve pit (181 feet south of the shoreline). The cement slurry plugs would be allowed to
8 cure for a minimum of 24 hours before cutting the pipelines.

9 2.3.1.2 Landside Terrestrial Levee Segment Cementing

10 The north landing's landside terrestrial levee segments of Line 114-1 and Line SP4Z
11 would be filled with cement slurry plugs from the Landside Terrestrial Levee Segment
12 Cut Point to a point 50 feet north. Line 114 is already filled with cement slurry and would
13 not require additional cementing. To facilitate the cementing of Line 114-1 and Line
14 SP4Z, all three pipelines would be excavated where they cross the levee's lower access
15 road at a point approximately 15 feet north of the original toe of the levee (the landside
16 terrestrial levee segment cut point).

17 The pipelines may be buried as deep as 10 feet below the roadway. The total
18 excavation volume is estimated at approximately 71 cubic yards (cy). All three pipelines
19 would be cut at this planned cut point (Figure 2-8).

20 At each cut point, a band of the pipeline's exterior coating would be removed and the
21 removed coating captured for offsite disposal. Once the flanges have been installed on
22 Line 114-1 and Line SP4Z, a foam pig would be placed inside of these two pipelines
23 and a cement supply hose connected to the first of the two pipelines to receive the
24 cement slurry plug. The purpose of the foam pig in each pipeline is to serve as a swab
25 in front of the cement slurry flow pumped into each pipeline to ensure that the cement
26 slurry is not permitted to run past the intended end of the cement slurry plug and to
27 ensure that the plugged segments of pipeline are completely filled with cement slurry.

28 The equipment would be positioned on the lower access road near the open trench. A
29 cement supply hose shall be connected to the concrete pump and the end of the first
30 pipeline to receive the cement slurry plug. Approximately 8.5 cy of cement slurry would
31 be required for each of the two terrestrial/shoreline pipeline segments. The volume of
32 cement slurry placed in each pipeline would be controlled by placing a measured
33 amount of cement slurry in each pipeline. Both pipelines would be pumped full of slurry
34 to provide an approximately 50-foot-long cement plug.

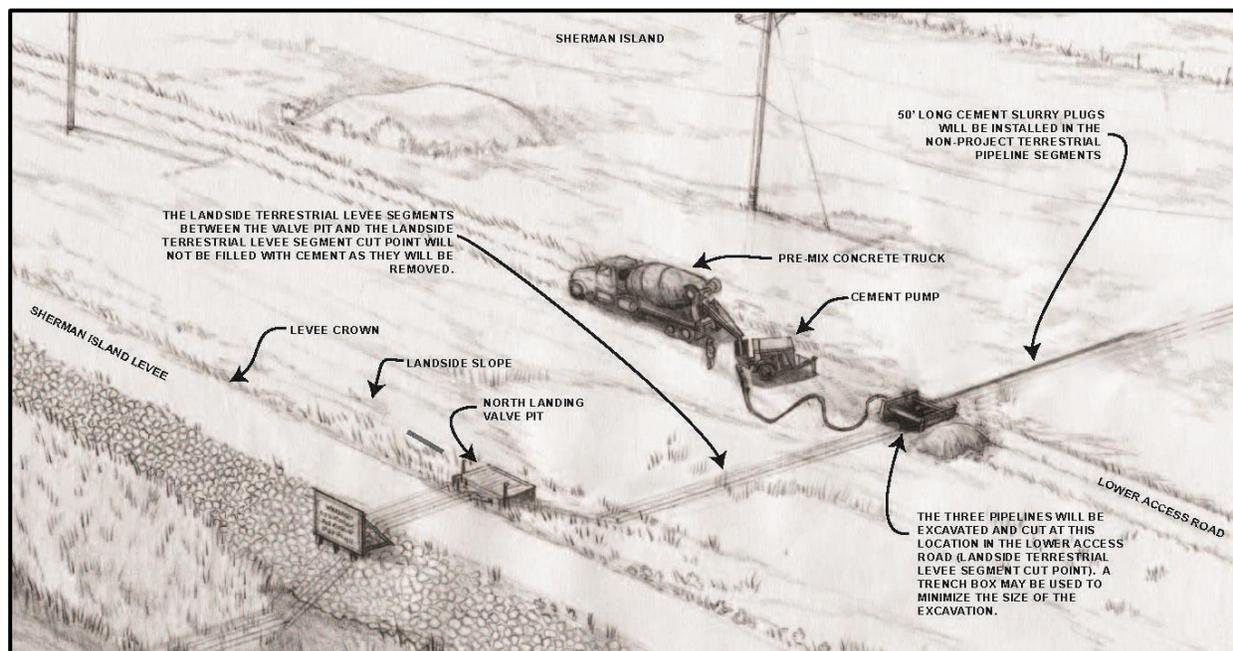


Figure 2-8. Cementing Landside Terrestrial Levee Segment (Northern Landing)

1 Upon completion of the installation of the cement slurry plugs in the two pipelines, and
 2 after the terrestrial segments of these pipelines have been removed up to the north
 3 landing valve pit, the flanges would be cut off the ends of Line 114-1 and Line SP4Z,
 4 and the stub ends of all three pipelines (Line 114, Line 114-1, and Line SP4Z) would be
 5 capped with 0.5-inch-thick steel plates welded to the pipe ends.

6 2.3.1.3 Landside Terrestrial Levee Segment Removal

7 Upon completion of the installation of the cement slurry plugs in the north landing's
 8 landside terrestrial levee segments, the three pipeline segments between north
 9 landing's landside terrestrial levee segment cut point and the north landing valve pit
 10 would be removed. Removal would involve excavation of the three pipeline segments,
 11 cutting them into segments, removing them, trucking them offsite for disposal, and
 12 backfilling the excavated trench (Figure 2-9).

13 2.3.1.4 Waterside Terrestrial and Shoreline Segment Roadway Removal

14 Upon completion of the north landing's landside terrestrial levee pipeline segment
 15 removals, the north landing's waterside terrestrial and shoreline pipeline segments
 16 would be decommissioned. These segments consist of three 12-inch-diameter nominal
 17 pipelines that exit the waterside (south) wall of the north landing valve pit, pass
 18 underneath the roadway on the crown of the Sherman Island levee, down the waterside
 19 slope of the levee, and underneath the riverbed where they would terminate at the
 20 northern submarine pipeline cut points (Figure 2-10).

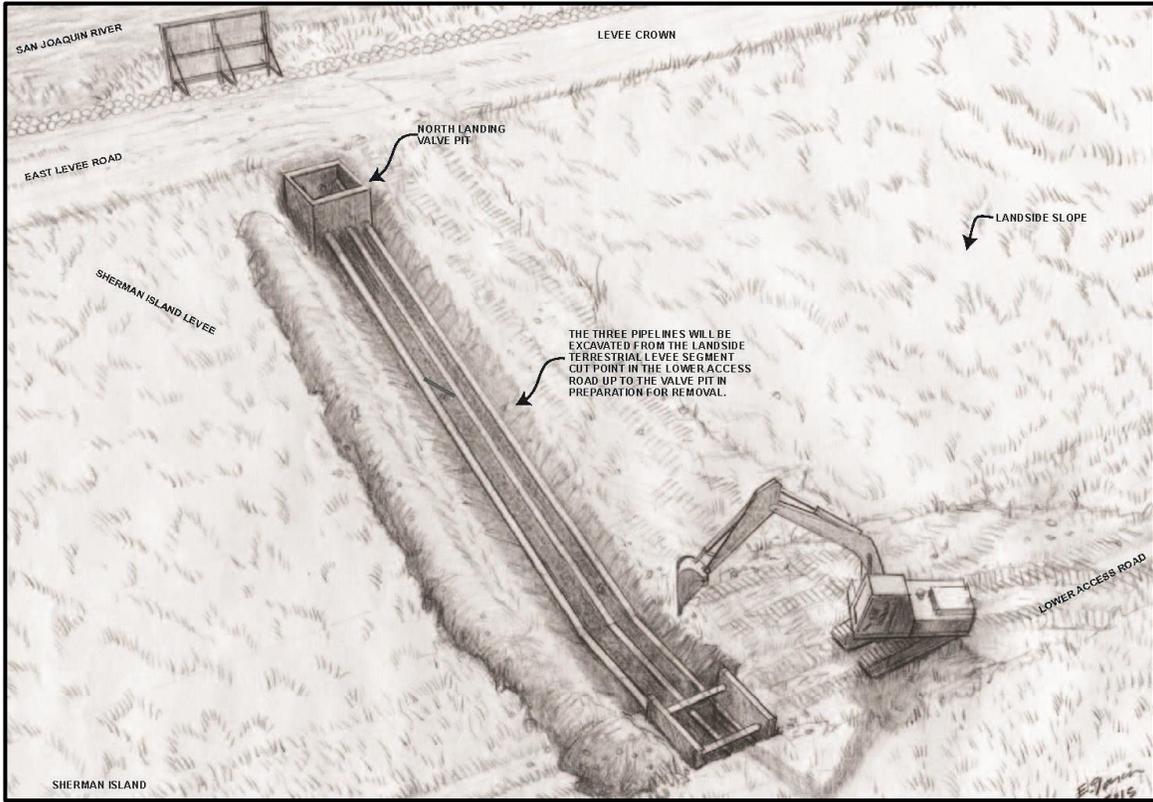


Figure 2-9. Landside Terrestrial Levee Segment Excavation and Removal

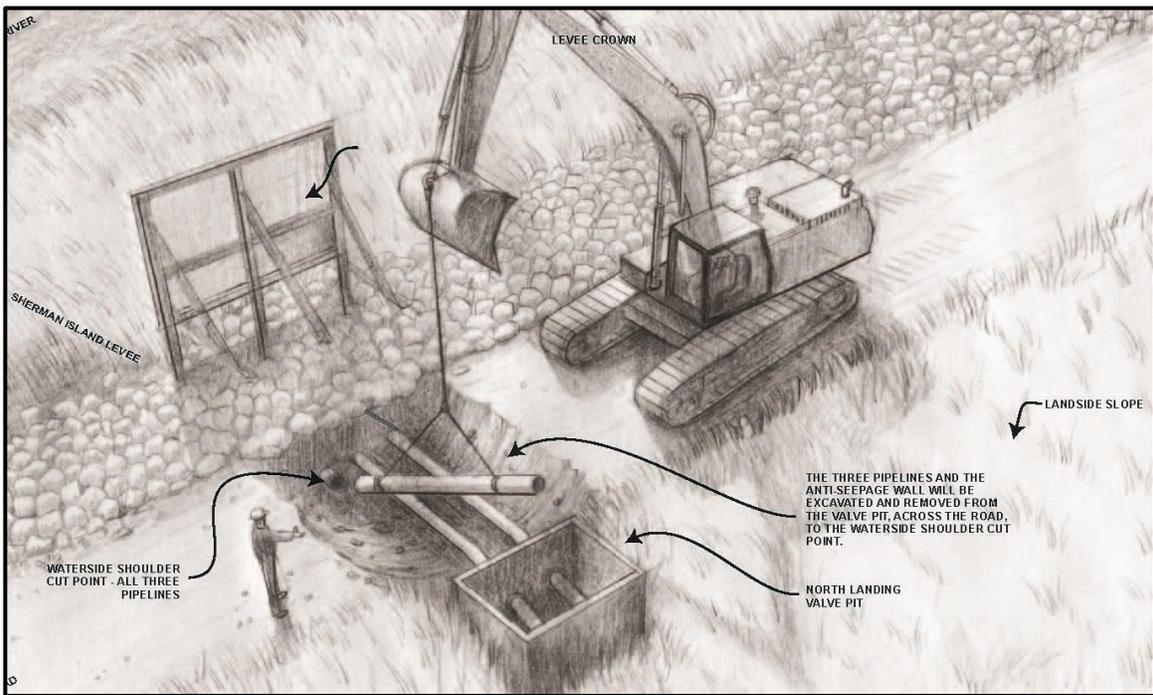


Figure 2-10. Waterside Terrestrial and Shoreline Segment Excavation and Removal

1 These pipe segments would have already been filled with cement slurry plugs in the
2 initial decommissioning work at the north landing and the sections of pipe from the valve
3 pit to south side of the levee crown would be ready for removal.

4 Removal would start by excavating the three pipeline segments from the valve pit, up
5 the levee slope, and across the roadway on the levee crown to the south shoulder of the
6 levee crown (just before the ridgeline of the riprap rock slope on the waterside slope of
7 the levee), a distance of approximately 27 feet. At approximately 15.7 feet from the
8 south wall of the valve pit, the pipelines pass through a reinforced concrete anti-
9 seepage wall embedded in the levee road. This anti-seepage wall would also be
10 excavated and removed.

11 The anti-seepage wall measures approximately 8 inches in thickness, 4 feet in height,
12 and 13.25 feet in width. Assuming approximately 2 feet of cover over the anti-seepage
13 wall, the total excavation depth is projected to be approximately 6 feet at the anti-
14 seepage wall to completely expose the pipeline segments. The total excavation volume,
15 including the pipeline segments and the anti-seepage wall, is estimated at
16 approximately 60 cy (50 cy of road base spoils plus 10 cy of recovered pipe and
17 concrete rubble).

18 Once exposed, the three pipelines would be cut near the south shoulder of the crown at
19 the predesignated waterside shoulder cut point in preparation for removal. The cut
20 pipelines would be removed across the roadway to the valve pit and the anti-seepage
21 wall would be demolished and removed. The remaining waterside terrestrial and
22 shoreline segments (from the waterside shoulder cut point to the northern submarine
23 pipeline cut point), which were previously filled with cement slurry in the earlier
24 cementing operation, would then be capped with 0.5-inch-thick steel plates welded to
25 the pipe ends, and abandoned in place. These segments extend approximately 180 feet
26 south (offshore) of the northern shoreline of the San Joaquin River.

27 The total weight of the recovered pipe segments is estimated to be 6 tons (including
28 cement inside the pipe segments). One 10-ton dump truck trip is projected to haul off
29 the recovered pipe. The concrete and rebar debris from the demolished anti-seepage
30 wall, which has an estimated weight of 4 tons, may be hauled off with the recovered
31 pipe segments for recycling or disposal. A second 10-ton dump truck trip may be
32 required to haul off the concrete and rebar debris, resulting in a total of two 10-ton dump
33 truck trips. The Sherman Island East Levee Roadway would be backfilled and
34 compacted to CVFPB/RD 341 requirements (Title 23 Standards). The roadway would
35 be returned to existing contours.

1 2.3.1.5 Valve Pit Demolition and Removal

2 The north landing valve pit would be demolished and removed in its entirety. First, all
3 piping that passes through the valve pit would be removed. Once the piping has been
4 removed, the concrete valve pit would be broken up with an excavator-mounted breaker
5 or similar equipment. The concrete and rebar rubble would be recovered, loaded on a
6 truck and shipped offsite for recycling or disposal. After the concrete and rebar rubble
7 has been removed, the underlying and surrounding soil, including the area around the
8 drain pipe and its down slope termination point, shall be sampled for presence of any
9 contaminants that exceed allowable regulatory limits. If contaminated soil is found, it will
10 be removed and properly disposed of at an approved offsite facility.

11 The valve pit excavation would be backfilled and matched with existing levee slope with
12 native soil acceptable to the CVFPB/RD 341 and compacted to CVFPB/RD 341
13 requirements (to Title 23 Standards). The Sherman Island East Levee Road would also
14 be backfilled and compacted (to Title 23 Standards) at this time. The valve pit
15 decommissioning is expected to generate approximately 20 tons of concrete and rebar
16 rubble. Assuming no contaminated soil is found under or around the valve pit and no
17 excavation work is required to remove contaminated soil, the valve pit excavation would
18 require approximately 15 cy of imported native backfill (clean, screened dirt excavated
19 from the slopes of Mount Diablo). The roadway excavation would require approximately
20 60 cy of road base backfill. The spoils from the levee roadway excavation would provide
21 approximately 50 cy of road base backfill. An additional 10 cy (approximately) of
22 imported road base backfill would be required to restore the roadway to original
23 contours. It is estimated that two 10-ton dump truck trips would be required to haul off
24 the concrete and rebar rubble, and two 10-ton dump truck trips would be required to
25 import the required additional road base materials.

26 2.3.1.6 Marine Navigation Safety Sign Removal

27 The marine navigation safety sign located on the south shoulder of the Sherman Island
28 levee would be removed in its entirety, including the lumber posts and their cement post
29 holes and the area returned to pre-Project conditions. The recovered wood debris,
30 which has an estimated weight of 500 pounds or less, would be trucked offsite for
31 recycling or disposal.

32 2.3.1.7 Site Restoration

33 Site restoration at the north landing shall take place after Project-related trenches have
34 been backfilled and compacted to grade. Site restoration shall consist of grading the
35 backfilled and compacted trenches to match pre-existing surrounding contours and then
36 reseeding or re-vegetating the disturbed areas using the seed mix approved by RD 341.

1 **2.3.2 South Landing at Lauritzen Yacht Harbor**

2 The work at the south landing would begin with opening the three pipeline terminations
3 inside the valve pit at the Lauritzen Yacht Harbor to vent the pipelines while the cement
4 slurry plug is installed in the north landing's waterside terrestrial and shoreline pipeline
5 segments. The following steps would then be taken to decommission the pipelines and
6 navigational sign in this location. For full construction procedures, please refer to the
7 PEP (included within Appendix A).

- 8 • Pipeline Venting During Installation of Cement Slurry Plugs in North Landing
9 (Section 2.3.2.1).
- 10 • Terrestrial and Submarine Pipeline Segment Cementing (Section 2.3.2.2).
- 11 • Marine Navigation Safety Sign Removal (Section 2.3.2.3).

12 2.3.2.1 Pipeline Venting During Installation of Cement Slurry Plugs in North Landing 13 Waterside Terrestrial and Shoreline Segment

14 Once the cement slurry plugs have been installed in the north landing's waterside
15 terrestrial and shoreline pipeline segments, the blind flanges that were loosened or
16 removed shall be temporarily re-installed until the cementing of the south landing's
17 terrestrial and submarine pipeline segment occurs. The total amount of air or gas
18 displaced from the three pipelines by the installation of the cement slurry plugs is limited
19 to the length of the cement slurry plugs (planned at approximately 285 feet in the north
20 landing's waterside terrestrial and shoreline pipeline segments).

21 2.3.2.2 Terrestrial and Submarine Pipeline Segment Cementing

22 After the pipelines have been cut at the northern submarine pipeline cut point, a
23 terrestrial crew would return to the south landing to install cement slurry plugs in the
24 south landing's terrestrial and submarine pipeline segments. The reason for this
25 particular order of completion is because the cement slurry plug installations at the
26 south landing would displace air or gas in the pipelines that must be vented through the
27 open ends of the cut pipelines offshore of the north landing.

28 All three pipelines are already terminated with 12-inch-diameter flanges and would be
29 ready for cementing. The crews would remove the blind flanges attached to the pipe
30 ends and place a foam pig inside of each of the three open pipeline ends. A cement
31 supply hose would be connected to the first of the three pipelines to receive the cement
32 slurry plug. The purpose of the foam pig in each pipeline is to serve as a swab in front of
33 the cement slurry flow pumped into each pipeline to ensure that the cement slurry is not
34 permitted to run past the intended end of the cement slurry plug, and that the plugged
35 segments of pipeline are completely filled with cement slurry.

1 The total length of each cement slurry plug would be approximately 781 feet long (50
2 feet past the planned southern submarine pipeline cut point). Approximately 35.3 cy of
3 cement slurry would be required for each of the three south landing's waterside
4 terrestrial and shoreline segments. The volume of cement slurry placed in each pipeline
5 would be controlled by placing a measured amount of cement slurry in each pipeline.

6 When the installation of the cement slurry plugs in the three pipelines has been
7 completed, the flanges would be cut off each pipeline approximately 12 inches off of the
8 waterside (north) interior wall of the south landing valve pit. These stub ends would be
9 capped with 0.5-inch-thick steel plates welded to the pipe ends. This would complete
10 the abandonment in place of the three pipelines at the south landing.

11 2.3.2.3 Marine Navigation Safety Sign Removal

12 The marine navigation safety sign located on the shoreline of the Lauritzen Yacht
13 Harbor, over the pipeline alignments, would be removed down to ground level and the
14 remaining cemented post holes abandoned in place. The recovered wood debris, which
15 has an estimated weight of 500 pounds or less, would be trucked offsite for recycling or
16 disposal.

17 The terrestrial crew at the south landing would demobilize once the cement plugs have
18 been installed in the pipeline ends at the south landing and the marine safety sign at the
19 south landing has been removed.

20 2.3.3 Pipeline Crossings - San Joaquin River

21 Line 114, Line 114-1, and Line SP4Z cross the San Joaquin River between Sherman
22 Island and the City. The marine crews would work across the river excavating and
23 removing the three inactive pipelines. The work would be performed by a marine work
24 spread of floating equipment and crews that includes an anchored derrick barge. The
25 pipelines may be excavated, raised to the deck of the derrick barge and cut into
26 sections, or the pipelines may be pulled up through the riverbed overburden without
27 excavation and cut into sections, conditions permitting. In either case, the recovered
28 pipeline segments would be cut into sections and transported to the offsite shore base
29 for offloading and trucking to recycling or disposal facilities.

30 The following steps would be taken to decommission the pipelines and navigational sign
31 in this location. A brief description of these steps is provided below. For full construction
32 procedures, please refer to the PEP (included within Appendix A).

- 33 • Northern Pipeline Cutting Operation (Section 2.3.3.1).
- 34 • Submarine Pipeline Removal Operations (Section 2.3.3.2).
- 35 • Southern Pipeline Cutting Operation (Section 2.3.3.3).

1 2.3.3.1 Northern Pipeline Cutting Operation

2 A baseline riverbed debris survey would be performed prior to the arrival of the
3 decommissioning contractor's marine equipment at the Project site. The baseline debris
4 survey would consist of a side-scan sonar with 400 percent coverage and a bathymetric
5 survey of the entire underwater work site. A pre-decommissioning survey map would be
6 provided to the agencies upon completion of the survey work and map production.

7 The marine work would begin at the northern submarine pipeline cut point located
8 approximately 180 feet offshore of the northern shoreline of the San Joaquin River in
9 approximately 20 feet of water where the pipeline is buried approximately 5 feet below
10 the riverbed.

11 The marine work would take place from a derrick barge anchored over the site. The
12 derrick barge would be equipped with a four-point mooring system and spuds and would
13 be anchored in accordance with the Project Marine Safety and Anchoring Plan (please
14 refer to the PEP included within Appendix A). The derrick barge would be tended by a
15 tugboat that would tow the derrick barge and set and recover its anchors in accordance
16 with the Anchoring Plan.

17 Some underwater excavation work would be required prior to cutting the pipeline. The
18 excavation would be performed with either a Toyo submersible pump excavation
19 system or by hand jetting using a diver held hand jet supplied by a skid mounted jet
20 pump on the deck of the derrick barge. In the event that a Toyo submersible pump or
21 airlift is used it would be operated by the derrick barge crane. The submersible pump or
22 airlift would be positioned over the submerged and buried pipelines using a full time,
23 real time, differential global positioning system (DGPS) with sub-meter accuracy. A
24 DGPS antenna would be placed on the tip of the derrick barge crane boom to provide
25 an exact horizontal position of the submersible pump or airlift when deployed by the
26 crane. A video monitor with a real time display of the DGPS survey data would also be
27 stationed in the derrick barge crane operator's cab and the pipeline alignments and the
28 derrick barge positions and crane boom tip, with submersible pump or airlift suspended
29 underneath, would be displayed in real time on the crane cab video monitor. This would
30 enable the crane operator to place the submersible pump or airlift directly over the
31 pipeline alignments. The crane operator would lower the submersible pump or air lift
32 until it touches the riverbed at the precise location of excavation and then turn on the
33 submersible pump or airlift to perform a single pothole excavation. Once the
34 submersible pump or airlift reaches the desired excavation depth (top of pipeline) the
35 submersible pump or airlift would be turned off and the submersible pump or airlift
36 raised back above the riverbed and positioned for the next pothole excavation. This
37 process would be repeated for each section of pipeline requiring excavation. This
38 underwater excavation method is very precise and all submersible pump or airlift
39 operations would take place at or below the riverbed (no operation in the water column)

1 in order to prevent entrainment or impingement of fish. The excavated sandy sediments
2 that characterize the channel bottom within the Project area are expected to rapidly
3 settle to the bottom.

4 The exact cut point on each pipeline would be located by positioning an underwater
5 “plumb bob” (heavy chain) suspended from the derrick barge crane, and tracked by the
6 DGPS system’s crane boom tip antenna, directly over each cut point on the three
7 pipelines. The divers would mark each position and then cut the pipelines. The cuts
8 would be made within the cement slurry plugs in each pipeline, leaving an
9 approximately 50 feet long cement plug in each of the three pipelines offshore of the cut
10 point. This would be done to ensure that the underwater ends of the pipelines
11 abandoned in place beneath the riverbed are completely filled with cement.

12 The pipelines would be cut using underwater cutting equipment. This equipment may
13 consist of a hydraulically powered underwater guillotine saw (WACH Guillotine Model D
14 Hydraulic Saw or equivalent) or underwater oxy-arc cutting equipment. Prior to cutting
15 each pipeline, a band of coating would be removed at each cut point to facilitate a clean
16 cut. The coating chips would be recovered to the extent that the underwater river
17 conditions and water currents permit.

18 2.3.3.2 Submarine Pipeline Removal Operations

19 Once the pipelines have been cut, the derrick barge would begin excavating one of the
20 three pipelines for a pre-determined distance from the cut point south to expose enough
21 of the pipeline to bring the pipeline to the surface and place the end of the pipeline on
22 the derrick barge deck. The excavation length may range between 100 to 500 feet.

23 One of two methods may be used to recover the submarine pipeline segments. The first
24 method would involve excavating all or part of each pipeline, returning to the pipeline
25 end, raising the pipeline end to the deck of the derrick barge, then cutting the pipeline
26 into sections on the deck of the derrick barge. The cranes would lift the pipeline and the
27 derrick barge would underrun the suspended pipeline, following it across the river.
28 Alternatively, conditions permitting, the pipelines may be pulled up vertically through the
29 riverbed overburden by the derrick barge crane, without excavation.

30 The recovered pipeline segments would be cut into sections as the pipe is brought
31 aboard the derrick barge and the cut sections would be placed on a materials barge or
32 hopper barge for shipment to the shore base and then offloaded onto trucks for ground
33 transportation to recycling or disposal facilities. The total dry weight of the three
34 submarine pipeline segments scheduled for removal is estimated to be 474 tons or 158
35 tons per pipeline. The barge projected for use on this decommissioning Project would
36 be capable of carrying in excess of 2,000 tons of cargo, so the 474 tons of recovered

1 pipe can be stored at the work site and towed back to the shore base at the end of the
2 Project, thereby reducing the tug and barge offloading trips to a single trip.

3 If the pipelines cannot be pulled up through the riverbed, based on a trench no wider
4 than 12 feet, average 5.5 feet deep, and 3,519 feet in length, approximately 8,616 cy of
5 excavation could be required (refer to section 2.3.3.1 and the PEP [Appendix A] for
6 further details on excavation procedures and equipment). The excavation estimate is
7 projected as a worst-case and assumes that the pipelines are not bundled and that
8 each pipeline would require an individual trench. It is possible that over the length of the
9 crossings that the three pipelines may be located very close together and possibly even
10 touching. If this is the case, the excavation requirement may be reduced by 50 percent
11 or more.

12 2.3.3.3 Southern Submarine Pipeline Cutting Operation

13 The southern pipeline cut point is located approximately 130 feet offshore of the
14 southern shoreline of the San Joaquin River in approximately 10 feet of water and at a
15 point where the pipeline is buried approximately 5 feet below the riverbed. The exact cut
16 point on each pipeline would be located by positioning an underwater “plumb bob”
17 (heavy chain) suspended from the derrick barge crane, and tracked by the DGPS
18 system’s crane boom tip antenna, directly over each cut point on the three pipelines.
19 The divers would mark each position and then cut the pipelines. The cuts would be
20 made within the cement slurry plugs in each pipeline, leaving an approximately 50 feet
21 long cement plug in each of the three pipelines offshore of the cut point. This would be
22 done to ensure that the underwater ends of the pipelines abandoned in place
23 underneath the riverbed are completely filled with cement.

24 The pipelines would be cut using underwater cutting equipment. This equipment may
25 consist of a hydraulically powered underwater guillotine saw (WACH Guillotine Model D
26 Hydraulic Saw or equivalent) or underwater oxy-arc cutting equipment. Prior to cutting
27 each pipeline a band of coating would be removed at each cut point to facilitate a clean
28 cut. The coating chips would be recovered to the extent that the underwater river
29 conditions and water currents would permit.

30 The marine crew would demobilize once the submarine pipeline segments have been
31 removed and the post-decommissioning debris survey has been completed.

32 **2.4 EQUIPMENT AND PERSONNEL REQUIREMENTS**

33 Anticipated equipment and personnel requirements for each phase of the
34 decommissioning Project are provided in Tables 2-3 through 2-6 below.

**Table 2-3. Debris Survey -
Equipment and Personnel Requirements**

	Pre-Decommissioning				Post-Decommissioning			
	Qty.	Hrs.	Days	Total Hrs.	Qty.	Hrs.	Days	Total Hrs.
Personnel								
Environmental Monitor	1	10	1	10	1	10	1	10
Marine Surveyor/Survey Boat Captain	1	10	1	10	1	10	1	10
Marine Surveyor Technician	2	10	1	20	2	10	1	20
Equipment								
Survey Boat - Main Engine 298 horsepower (hp)	1	10	1	10	1	10	1	10

**Table 2-4. North Landing Decommissioning -
Equipment and Personnel Requirements**

	Qty.	Hrs.	Days	Total Hrs.
Personnel				
Project Manager	1	10	35	350
Environmental Monitor	1	10	35	350
Supervisor	1	10	35	350
Operators - Excavator/Skip Loader/Compactor	2	10	35	700
Welder/Helper	2	10	10	200
Concrete Pump Crew	3	10	7	210
Laborers	2	10	31	620
Equipment				
Concrete Pump - Cummins 220 hp	1	8	7	56
Welding Machine - 300 AMP /24.7 hp	1	6	10	60
Industrial Air Compressor (185CFM/61 hp)	1	6	6	36
Skip Loader - CAT 450/127 hp	1	8	5	40
Compactor - CAT CP54/131	1	8	5	40
Excavator w/ Breaker - CAT 329/286 hp	1	8	5	40

**Table 2-5. South Landing Decommissioning -
Equipment and Personnel Requirements**

	Qty.	Hrs.	Days	Total Hrs.
Personnel				
Environmental Monitor	1	10	13	130
Supervisor	1	10	13	130
Welder	1	10	3	30
Concrete Pump Crew	3	10	7	210
Laborers	2	10	13	260
Equipment				
Concrete Pump - Cummins 220 hp	1	8	7	56
Welding Machine - 300 AMP/24.7 hp	1	8	3	24

**Table 2-6. Submarine Pipeline/River Crossings Removal Operations -
Equipment and Personnel Requirements**

	Qty.	Hrs.	Days	Total Hrs.
Personnel				
Project Manager	1	10	30	300
Environmental Monitor	1	10	30	300
Barge Superintendent	1	10	30	300
Barge Crane Operator	1	10	30	30
Riggers/Welders	4	10	30	1200
Tugboat Crew	2	10	30	600
Divers	6	10	30	1800
Surveyor	1	10	30	300
Equipment				
Derrick Barge - Generator - 100 hp	1	24	42	1008
Derrick Barge - Crane - 150 hp	1	9	30	270
Anchor Winches - RB-90s - 238 hp	2	2	30	120
Deck Winch - RB-90/238 hp	1	4	30	120
Tugboat - Mains - 250 hp	2	6	30	360
Tugboat - Generator - 75 hp	1	24	42	1008
Welding Machine - 300 AMP/24.7 hp	1	2	6	12
Jet Pump - 250 hp	1	8	30	240
300 kW Diesel Driven Generator (Toyo Pump) - 463 hp	1	8	30	240
5120 Diver's Air Compressor - 47 hp	1	8	20	160
Work Skiff - Outboards/250 hp	2	2	30	120

1 2.5 PROJECT SCHEDULE

2 Project implementation is tentatively planned during the recommended environmental
3 aquatic work window of August 1 through October 31, 2015. The total duration of the
4 decommissioning is anticipated to take approximately 60 days, not including the pre-
5 and post-remediation debris surveys, based on working no more than 6 days per week
6 and one 10 to 12 hour shift per day. PG&E anticipates that each decommissioning work
7 phase would take the following approximate amount of time to complete.

Phase	Approximate Timing	
Mobilize Contractor Equipment to Site and Start Pre-Decommissioning Debris Survey	1 week	
North Landing Decommissioning	5 weeks	To be conducted concurrently
South Landing Decommissioning	2 weeks	
Submarine Pipeline Decommissioning	6 weeks	
Complete Post-Decommissioning Debris Survey	1 week	