Appendix 14-I

Description of Stream Crossing for Electrical Interconnect

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CPV Valley Energy Project
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The CPV Valley Energy Project will include an underground electrical interconnect crossing of Carpenter Creek in the eastern part of the site (see Figure 14-3 of DEIS). The selection of this route is based on the requirement to transition an overhead electrical line from on-site to an underground line that will extend along the road shoulder of Route 17M in an underground conduit. The following is a description of stream crossing methods that will be considered in constructing the underground conduit.

Stream Crossing

In the eastern part of the site, the construction of the transition area from overhead to underground lines, and the crossing of Carpenter Creek will result in temporary disturbance of 6,000 sq. ft. of shallow emergent marsh community, with a crossing of Carpenter Creek, to install the electrical conduit bank. The trench and conduit bank crossing of the stream will be conducted using one of several standard possible methods available to the contractor and based on electrical engineering requirements. These methods include a flumed crossing (Figure 14I-1), dam and pump crossing (Figure 14I-2), or wet crossing (Figure 14I-3). Each of these methods include a means of temporarily diverting stream flow around or through the work area while the trench is dug and the conduits laid in. An equipment travel and work staging corridor will be temporarily established across the stream in order to dig the trench and install the conduits. In total, a 10' wide construction corridor, including both the trench and the travel/work staging corridor, will be utilized at the stream crossing. Excavated soils will be temporarily stockpiles in adjacent non-wetland areas and/or on swamp mats to minimize fill placement directly on wetlands or the watercourse.

Each typical crossing method for construction of the underground electrical conduit is described in detail below.

Flume Crossing Method

This method involves diverting the flow of the stream through one or more flume pipes placed in the stream (see Figure 14I-1). The flume pipes must be sufficient in number and adequate in size to accommodate the highest anticipated flow during construction. After placing the pipes in the stream, sand or pea gravel bags are placed upstream and downstream of the proposed trench. These bags serve to divert stream flow through the flume pipes and away from the construction area.

Backhoes are located on both banks of the stream and excavate a trench under the flume pipe(s) in the isolated stream bed. Spoil excavated from the trench is temporarily stored in a straw bale/silt fenced containment area located a minimum of 10 feet from the edge of the waterbody. Once the trench is excavated, the electrical conduit bank is installed beneath the flume pipes. The trench is then backfilled with the stored native soil and stream banks are stabilized. Once these restoration efforts are completed, the flume pipes and the sand or pea gravel bags are removed and normal flow is re-established.

Dam and Pump Method

The dam and pump crossing method involves constructing temporary sand or pea gravel bag dams upstream and downstream of the proposed crossing site and using a high capacity pump to divert water around the construction area (see Figure 14I-2). Energy dissipation devices, such as plywood boards or metal sheets, are placed at the discharge point on the downstream side to prevent streambed scour. A portable pump is used, as necessary, to remove any standing water from between the dams, thereby creating a “dry” construction area. This water is pumped into an energy dissipation/sediment filtration dewatering structure such as a straw bale/silt fence or a geotextile filter bag located a minimum of 10 feet from the stream banks to prevent heavily silt-laden water from flowing into the waterbody.

Once the area between the dams is dry, backhoes positioned on both banks excavate the trench across the stream. Spoil excavated from the trench is temporarily stored in the straw bale/silt fence containment area. Leakage from the dams or subsurface flow from below the stream bed may cause water to accumulate in the trench. Accumulated trench water is periodically pumped out, as necessary, using the portable pump, and discharged into the dewatering structure. Temporary trench plugs are installed in the trench at the edges of the waterbody if the possibility exists for sediment-laden water to flow from uplands down the trench and into the waterbody.

After trenching is accomplished, a prefabricated segment of pipe is installed in the trench, the stream bed portion of the trench is immediately backfilled with stored stream bed spoil, and the stream banks are stabilized. Following completion of these restoration efforts, the dams are removed and normal flow is re-established.

Open-Cut Method

The open-cut crossing method will involve excavation of the pipeline trench across the waterbody, installation of the pipeline, and backfilling of the trench with no effort to isolate flow from construction activities (see Figure 14I-3). Excavation and backfilling of the trench will be accomplished using backhoes or other excavation equipment working on swamp mats, as necessary. Trench spoil will be stored at least 10 feet from the banks (topographic conditions permitting). The electrical conduit bank will then be constructed in the trench. The trench will then be backfilled and the bottom of the watercourse and banks restored and stabilized. Sediment barriers, such as silt fencing, staked straw bales, or trench plugs will be installed to prevent spoil and sediment-laden water from entering the waterbody from adjacent upland areas.

Following construction using any of these methods, the wetlands and watercourse will be stabilized and restored with vegetative plantings and, as needed, non-structural stabilization materials such as temporary matting

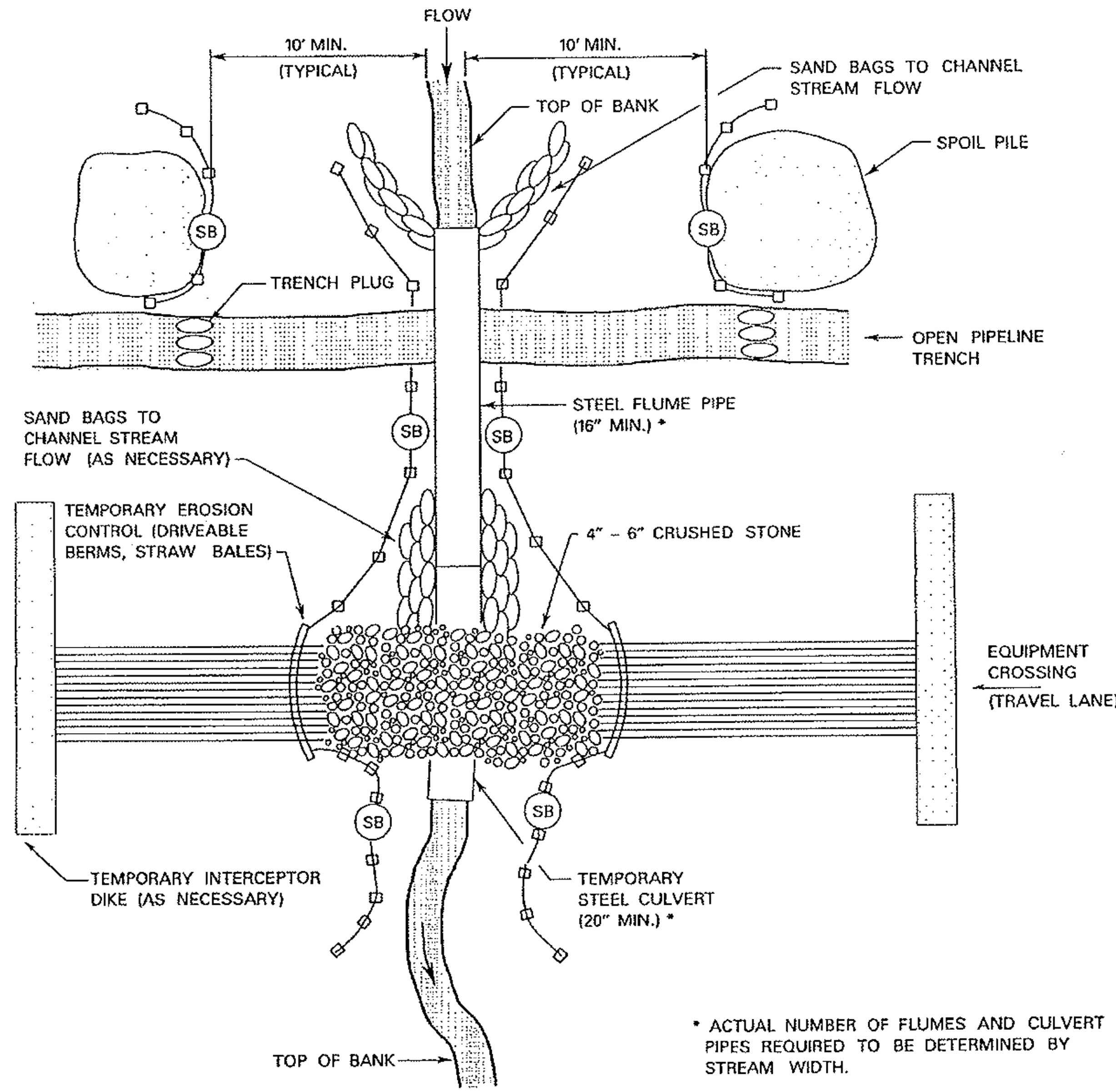
Mitigation Measures

The general wetland construction and mitigation actions, as outlined below, are intended to minimize adverse environmental impacts to wetlands. The Applicant will use the best available technology by:

- Using the most appropriate equipment or machinery, including hand-cutting;
- Implementing appropriate maintenance and operation on the equipment or machinery, including adequate training, staffing, and working procedures;

- Using machinery and techniques that are designed to reduce drainage impacts to wetlands;
- Designing appropriate wetland crossings that will maintain water flows and accommodate fluctuating water tables;
- Routing the interconnect to minimize the number of wetland crossings;
- Maintaining adequate flow in wetlands to protect aquatic life and prevent the interruption of downstream uses;
- Limiting equipment operating in wetlands;
- Limiting removal of vegetation;
- Using low-ground-weight construction equipment if standing water or saturated soils are present;
- Dewatering trenches in such a manner that no heavy silt-laden water flows into any wetland;
- Utilizing temporary sediment barriers; and
- Provide post-construction maintenance and monitoring to establish success of revegetation

Erosion and sedimentation will be controlled by practical construction techniques and erosion and sedimentation controls. With the proper installation and maintenance of erosion control barriers and other control measures, the extent of any indirect impacts from erosion and sedimentation should be minor.



* ACTUAL NUMBER OF FLUMES AND CULVERT PIPES REQUIRED TO BE DETERMINED BY STREAM WIDTH.

NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS.
2. SAND BAGS MUST BE FILLED WITH SAND FREE OF SILT, ORGANICS, AND OTHER MATERIAL.
3. ALIGN FLUME(S) TO PREVENT BANK EROSION AND STREAM SCOUR.
4. CONDUCT ALL IN-STREAM ACTIVITY (EXCEPT BLASTING OR OTHER ROCK BREAKING MEASURES) WITH THE FLUME(S) IN PLACE. FLUME PIPE(S) MAY NOT BE REMOVED FOR LOWERING IN OR INITIAL STREAMBED RESTORATION EFFORTS.
5. THE ENDS OF THE FLUME AND CULVERT MUST EXTEND TO AN UNDISTURBED AREA.

	TYPICAL FLUMED CROSSING	FIGURE 14I-1 DWG. ES–0030 REV.

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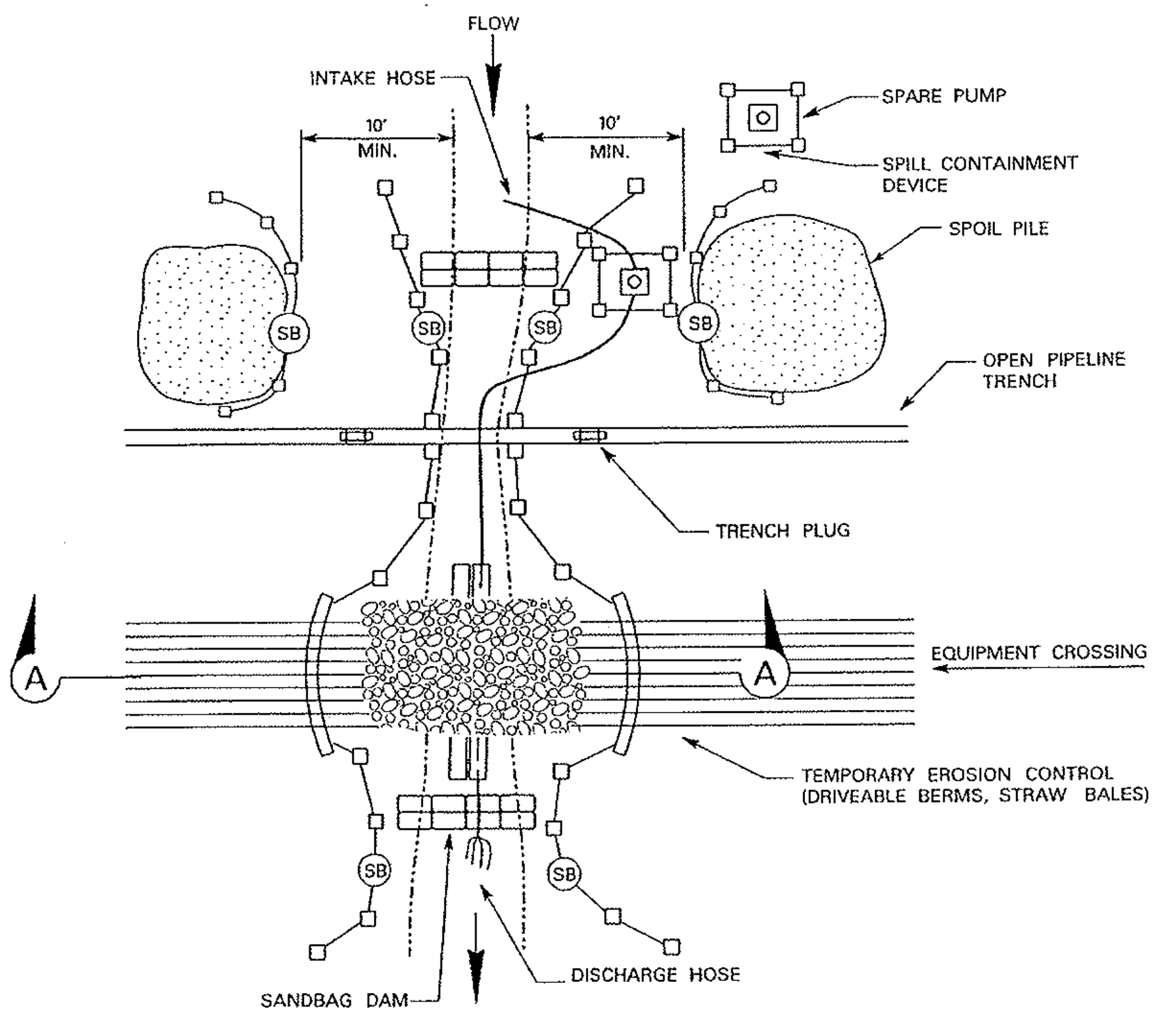
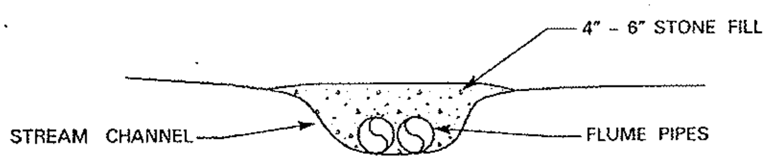


PLAN VIEW



SECTION "A-A"

NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR OTHER APPROPRIATE MATERIALS
2. INSTALL AND SEAL SANDBAGS UPSTREAM AND DOWNSTREAM OF THE CROSSING.
3. CREATE AN UPSTREAM SUMP USING SANDBAGS IF NATURAL SUMP IS UNAVAILABLE FOR THE INTAKE HOSE.
4. EXCAVATE ACROSS STREAM CHANNEL FOLLOWING WATER REROUTING.
5. DO NOT REFUEL OR STORE FUEL WITHIN 100 FEET OF THE WATERBODY, WHERE FEASIBLE.
6. MONITOR PUMPS AT ALL TIMES DURING STREAM CROSSING PROCEDURE.
7. USE SUFFICIENT PUMPS, INCLUDING ONSITE BACKUP PUMPS, TO MAINTAIN DOWNSTREAM FLOW.
8. SCREEN PUMP INTAKES.
9. NUMBER OF FLUME PIPES FOR EQUIPMENT BRIDGE WILL VARY DEPENDING ON SITE CONDITIONS.

	TYPICAL DAM AND PUMP CROSSING	FIGURE 14I-2
		DWG. ES-0031 REV.

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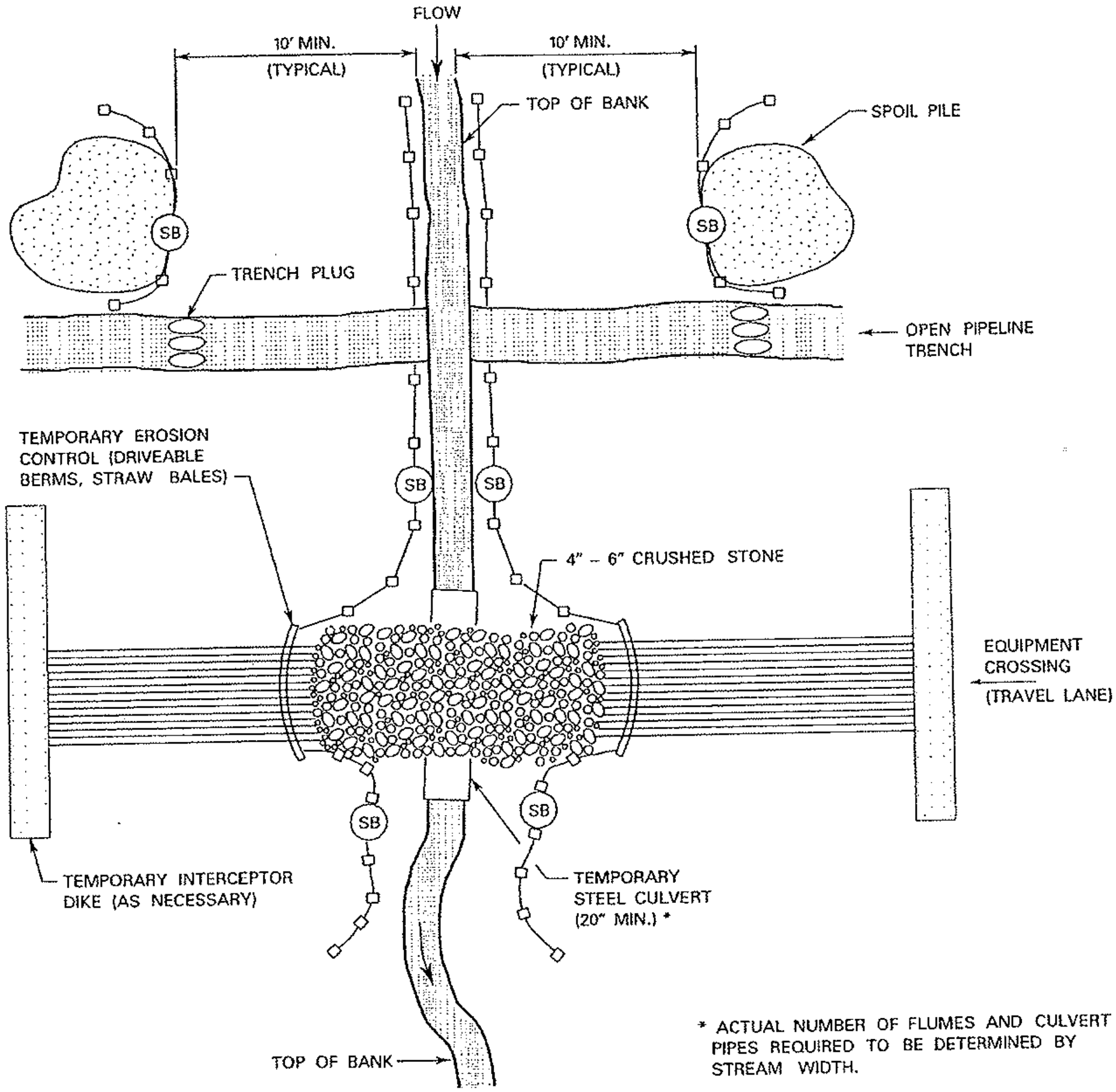

NOTES:

1. (SB) TEMPORARY SEDIMENT BARRIER OF SILT FENCE AND/OR STRAW BALES, OR APPROPRIATE MATERIALS.

2. FOR MINOR WATERBODIES, COMPLETE TRENCHING AND BACKFILLING IN THE WATERBODY (NOT INCLUDING BLASTING OR OTHER ROCK BREAKING MEASURES) WITHIN 24 CONTINUOUS HOURS. IF A FLUME IS INSTALLED WITHIN THE WATERBODY DURING MAINLINE ACTIVITIES, IT CAN BE REMOVED JUST PRIOR TO LOWERING IN THE PIPELINE. THE 24-HOUR TIMEFRAME STARTS AS SOON AS THE FLUME IS REMOVED.

3. FOR INTERMEDIATE WATERBODIES, COMPLETE TRENCHING AND BACKFILLING IN THE WATERBODY (NOT INCLUDING BLASTING OR OTHER ROCK BREAKING MEASURES) WITHIN 48 CONTINUOUS HOURS, IF FEASIBLE.

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	TYPICAL WET CROSSING	FIGURE 14I-3
		DWG. ES–0032 REV.