

## APPENDIX H STREAM DIVERSION PLAN

### H.1 INTRODUCTION

Implementation of the Dynegy Morro Bay Power Plant Marine Terminal Decommissioning Project (Project) may require Morro Creek to be diverted prior to and throughout construction activities. This Stream Diversion Plan (Plan) shall be used by the regulatory agencies during the permitting process and used in the field during Project construction.

Implementation of this Plan assumes the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) issue Biological Opinions (BO) to capture and relocate tidewater goby (*Eucyclogobius newberryi*) and south-central California coast steelhead (*Oncorhynchus mykiss irideus*) from the work area of Morro Creek.

#### H.1.1 PROJECT LOCATION

The Project is located directly north of the Morro Bay Harbor and just south of Morro Creek within the city limits and sphere of influence of the City of Morro Bay. The Project extends offshore into State tide lands, within Estero Bay, San Luis Obispo County, California (Township 29 South, Range 10 East [T29S/R10E] Mt. Diablo Base and Meridian).

#### H.1.2 PROJECT DESCRIPTION

Decommissioning activities associated with the Project include the complete removal of the onshore segments of the existing 24-inch diameter submarine pipeline, 16-inch diameter submarine pipeline, the cathodic protection system for the two pipelines, and ancillary submarine pipeline components.

Morro Creek's connection to the Pacific Ocean changes annually. Therefore, removal of the Beach Segment of pipeline may or may not impact Morro Creek. This Plan has been prepared in the event Morro Creek's alignment will be impacted during removal of one or more of the two pipelines.

### H.2 MORRO CREEK BIOLOGICAL RESOURCES

#### H.2.1 SPECIAL-STATUS SPECIES

##### H.2.1.1 Tidewater Goby

Tidewater goby is a small, grey-brown fish that averages less than two inches in length. It is endemic to California and is primarily found in shallow, brackish waters of coastal lagoons, estuaries, and marshes. Historically, tidewater goby ranged from Del Norte County to San Diego County along the coast of California. They still occur throughout their range, but in fewer locations. Tidewater goby completes its lifecycle within one year and reproduction can occur year round, especially within warmer water temperatures. They can occur in aggregations of several hundreds to thousands of individuals. They prefer open, sandy bottom substrates for breeding. Studies have shown wide variations in salinity, temperature, and water depth tolerances.

Tidewater goby was federally listed as endangered under the Endangered Species Act (ESA) in February 1994 and Critical Habitat was designated in January 2008 by USFWS (USFWS, 2008). Tidewater goby have not been documented within Morro Creek, but have the potential to occur (CNDDDB, 2015).

#### **H.2.1.2 Steelhead Trout**

Steelhead trout are an anadromous form of rainbow trout, meaning this fish reproduces in freshwater, but spends much of its life cycle in the ocean, where high prey density provides a greater growth rate. Steelhead are usually dark-olive in color, with silvery-white shading on the underside and heavily speckled body and a pink to red stripe running along their sides. They prefer to redd (or nest) within gravel-bottomed streams that are fast flowing and well oxygenated. Adults feed on insects, mollusks, crustaceans, fish eggs and other small fishes, while fry and immature steelhead primarily feed on zooplankton.

Steelhead are divided into 15 distinct population segments (DPS) based on similarity in life history, location, and genetic markers. The south-central California ESU was listed as threatened by the National Marine Fisheries Service (NMFS) on October 17, 1997. Morro Creek occurs within the south-central California coast DPS of steelhead Critical Habitat. Steelhead were identified within Morro Creek, approximately 0.04 mi (0.1 km) from the Project site (CNDDDB, 2015).

#### **H.2.1.3 California Red-legged Frog**

The California red-legged frog is a Federally Threatened species. The USFWS-designated Critical Habitat for California red-legged frog was finalized in March of 2001 for core areas selected based on the following criteria: 1) areas that are occupied by California red-legged frog; 2) areas where populations of California red-legged frog appear to be source populations; 3) areas that provide connectivity between source populations; and 4) areas that represent areas of ecological significance (USFWS, 2002). California red-legged frog use a variety of aquatic and terrestrial habitats, including streams, marshes, ponds, riparian woodlands, springs, lagoons, irrigation canals, wells, reservoirs, and even sewage treatment ponds, as well as upland habitats for dispersal/migration.

California red-legged frog have been documented 0.78 mi (1.3 km) northeast of the Project area within wetland habitat in Morro Strand State Park. Protocol-level surveys were conducted for California red-legged frog in 2000 within a 1.0 mi (1.6 km) section of Morro Creek intersecting the Project site (Villablanca, 2000). No California red-legged frog were observed during these surveys; however, due to nearby occurrences, as well as potentially suitable habitat within Morro Creek, California red-legged frog have the potential to occur within Morro Creek during stream diversion.

### **H.2.2 SPECIAL-STATUS REMOVAL AND RELOCATION**

Project activities may occur within the creek bed of Morro Creek if its alignment migrates over the pipelines; in this event, the work site must be dewatered. Dewatering can result in the temporary loss of aquatic habitat, and the stranding, displacement, or crushing of special-status species. Increased turbidity may occur from disturbance of the creek bed. Measures should be implemented as described in Part IX of the California Salmonid Stream Habitat Restoration Manual (CDFW, 2010).

Once Morro Creek is successfully diverted, fish and frog removal will be initiated. All fish and frogs within the Project site, specifically the Federally Endangered tidewater goby, Federally Threatened steelhead, and Federally Threatened California red-legged frog, will be captured by NMFS and/or USFWS approved biologists. All fish and frogs will be captured by net or by hand, and then temporarily placed in five gallon buckets. Fish and frogs will likely be released upstream of the Project site within relocation areas which will be identified prior to dewatering and approved by the NMFS and/or USFWS. Fish removal and relocation will be conducted pursuant to the Biological Opinions issued for the Project.

All captured and relocated fish and frogs will be counted and classified into the appropriate age class. In the event a tidewater goby, steelhead and/or California red-legged frog is killed during construction activities, NMFS and/or USFWS will be contacted and the fish/frog will be removed from the Project site and kept in a freezer until further direction from USFWS and/or NMFS.

### **H.3 DIVERSION AND DEWATERING DESCRIPTION**

Construction activities will not occur within Morro Creek. The creek will need to be diverted and/or dewatered prior to construction activities. Morro Creek fluctuates seasonally throughout the year. At times, Morro Creek may or may not fully connect to the Pacific Ocean. If there is no connection, a lagoon forms in the vicinity of the Morro Bay Strand Beach public access way.

Diversion and dewatering methods for each for these possible site conditions have been provided below.

#### **H.3.1 ALTERNATIVE 1 – MORRO CREEK LAGOON**

If Morro Creek is not connected to the Pacific Ocean, diversion of the lagoon will be required. If tidewater gobies and/or steelhead are present in the lagoon and the south outlet is closed, then the excavation site should be screened off to prevent fish access. A screen of sediment filter fabric or a fine-mesh block net (three millimeter [mm] mesh) will be placed between the lagoon and the pipeline at the south outlet. The screen's bottom edge will be anchored with rebar or other weights and covered with sand. Poles will support the upper part of the screen. After placing the screen, the area will be seined to remove any trapped fish, which will be placed in the lagoon. The screen should remain in place until a sandy berm is constructed to isolate the pipelines.

In the event of subsurface flow, sump pumps may be used to pump the additional water to an upland location allowing the water to filter out into the bank vegetation prior to re-entering Morro Creek downstream of the isolated area. Sump pumps may be required throughout the duration of construction activities to keep up with the subsurface flow. The outlet of the pump will be relocated to various locations to limit bank saturation and to allow for proper sediment filtration prior to the water re-entering Morro Creek. The isolated work area within the lagoon will be monitored by a USFWS/NMFS approved biologist.

All pumps used during dewatering activities will be covered by 1/8-inch screen. In addition, each sump pump may be placed in a screen basket to reduce the velocity of water

flowing into the pump, reducing harm to fish and other aquatic life. Pumps will be monitored regularly by USFWS/NMFS approved biologists.

Upon completion of construction activities, the temporary diversion structure will be removed.

### **H.3.2 ALTERNATIVE 2 – MORRO CREEK CONNECTION TO PACIFIC OCEAN**

If Morro Creek is connected to the Pacific Ocean, the Project site will be isolated through the use of cofferdams up and downstream. The cofferdams will be constructed out of sandbags and visqueen. One downstream and two upstream cofferdams will be used to ensure an isolated Project site. Morro Creek will be diverted through the use of a diversion culvert or artificial channel.

Prior to construction of the one downstream and two upstream cofferdam structures, the diversion culvert will be constructed in its entirety. Upon completion of the culvert construction, the primary cofferdam will be constructed and streamflow will be directed into the diversion culvert. Cofferdam construction will consist of visqueen and sandbags. Sandbags will be filled outside of the stream corridor with clean sand. Next, the secondary cofferdam will be constructed. Finally, the downstream cofferdam will be constructed, completing the Project site isolation. The isolated work area will be monitored regularly by a USFWS/NMFS approved biologist.

In addition to the cofferdam structures and diversion culvert, additional measures may be required to ensure an isolated Project site. A 1.5-inch sump pump shall be used between the two upstream cofferdam structures to catch any streamflow escaping from the primary upstream cofferdam. The sump pump shall be positioned in a low point between the two cofferdams and water shall be pumped directly into the diversion culvert. This will reduce the stress on the secondary cofferdam, allowing it to keep the Project site free from flowing water.

In the event of subsurface flow, sump pumps may be used to pump the additional water to an upland location allowing the water to filter out into the bank vegetation prior to re-entering Morro Creek downstream of the isolated area. Sump pumps may be required throughout the duration of construction activities to keep up with the subsurface flow. The outlet of the pump will be relocated to various locations to limit bank saturation and to allow for proper sediment filtration prior to the water re-entering Morro Creek.

All pumps used during dewatering activities will be covered by 1/8-inch screen. In addition, each sump pump may be placed in a screen basket to reduce the velocity of water flowing into the pump, reducing harm to fish and other aquatic life. Pumps will be monitored regularly by a USFWS/NMFS approved biologist.

Upon completion of construction activities, the temporary diversion structure will be removed. First, the downstream cofferdam will be removed. Next the diversion culvert will be removed one section at a time, allowing for all water to flow out of the culvert prior to removal from the channel. Finally, the upstream cofferdams will be removed. All sandbags will be removed in their entirety from the Project site.

#### H.4 REFERENCES

- California Department of Fish and Wildlife (CDFW). 2015. California Natural Diversity Database. Rare Find S.O. Morro Bay North, Morro Bay South, Cayucos quadrangles.
- California Department of Fish and Wildlife (CDFW). 2010. California Salmonid Stream Habitat Restoration Manual, 4<sup>th</sup> edition.
- US. Fish and Wildlife Service (USFWS). 2002. Recovery Plan for the California Red-legged Frog (*Rana aurora draytonii*). U.S. Fish and Wildlife Service, Portland, Oregon. viii + 173 pp.
- 2008. Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the Tidewater Goby (*Eucyclogobius newberryi*); Final Rule. January 31, 2008.
- Villablanca, F. and Holland, V.L. 2000. Review of Biological Survey Report for Duke Energy.