The Cher-Ae Heights Indian Community of the Trinidad Rancheria
FY 2009 Brownfields Cleanup Grant Proposal Attachment 1

Phase II Environmental Assessment For Cleanup, Removal and Recycling of Hazardous Debris Generated from the Trinidad Harbor Pier Replacement Project.

Prepared by
Trinidad Rancheria Environmental Program
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Context and Purpose	This Report presents an assessment of the contamination status of a pier structure to be demolished to prepare a site for reconstruction of the pier using non-contaminating materials.
Develop-ment Proposal	With funds secured from the Brownfields Cleanup Grant and other funding sources, the Trinidad Rancheria will deconstruct the existing pressure treated portion of the pier decking, extract the creosote treated piles that support the pier structure, remove these materials from the site, and recycle the decking and properly dispose of the pilings. This Phase II Environmental Assessment is intended to cover the needs of a Brownfields Cleanup Grant Application to fund the removal and disposal of creosote treated pilings, as well as other demolition aspects of the pier project that might be funded from other sources. These activities will effectively "cleanup" the surrounding harbor environment, as removal of these components will virtually eliminate identified pollutant sources from the pier and associated structures. If these actions are not taken, the pier will eventually deteriorate and the toxic materials will fall into the ocean and drift to further contaminate the harbor as well as new locations. The ultimate goal of the project following demolition is to replace the pier using non-toxic building materials. The pier decking and creosote treated piles will be removed in sections starting at the end of the pier and moving toward shore. The existing pier will provide the framework for reconstruction activities to take place. As the old pier sections are removed, the new pier will be constructed on the footprint of the old pier structure. The existing piles will be removed by vibratory extraction and new piles and decking will be installed from the existing dock, replaced with polymer-coated steel-cast concrete piles and recast concrete decking. All removed piles shall be temporarily stored at the upland staging areas until all demolition activities are complete. The creosote treated piles will then be transported to the Anderson Landfill or another approved upland disposal site for permanent disposal. The City of Trinidad has expressed interest in reusing the removed wood decking.
Current Site Status	The current pier is over 60 years old and was built with creosote treated pilings and pressure treated wood. The pier decking consists of approximately 13,500 square feet of 4" x 12" Douglas fir planking. Originally, it was all pressure treated, but replacement and repair has resulted in a deck that is about 60 percent untreated (Source: Craig Richardson, Harbor Manager, October, 2008). Therefore, the surface area of pressure-treated wood would be about 5400 weather-exposed square feet of decking, or about 5000 square feet, taking into account the spaces between the planks. This quantity of pressure treated decking would be regarded as a hazardous waste in terms of disposal, but fortunately, land-side recycle opportunity has been proposed by the City of Trinidad. Additionally, the untreated remainder of the pier decking has been exposed to varying degrees of contamination from operations on the pier, resulting is numerous visible oil spots created from parking of vehicles and other sources of leaks. The current pier decking is pervious and provides a non point source of runoff containing various known and unknown pollutants into the receiving waters surrounding the existing pier. Completed testing of the pier runoff identified exceedences for standards for total coliform, E.coli, enterococcus, and total petroleum

	hydrocarbons (TPH) as diesel and motor oil. The pier supports consist of 215 creosote-treated 12" x 12" pilings. They average 40'feet long. Therefore, the surface area of all of the pilings is about 27,000 square feet and the volume is 6751 cubic feet. The weight of pilings to be disposed of would be about 400 tons (Source for weight estimation: Mitigated Negative Declaration Trinidad Pier Reconstruction Project, Trinidad Bay, Humboldt County, August, 2007). Additionally, the pilings supporting the pier are creosote treated and leach toxic creosote-derived polycyclic aromatic hydrocarbons (PAHs) into the receiving water surrounding the project site. Creosote is potentially toxic to humans. Site specific tests run the by Tribal Environmental Program confirmed that water samples taken from runoff of creosote treated pilings contained measurable quantities of six creosote derived PAHs which are toxic, and quantities exceeded levels outlined in Table B of the California Ocean Plan.
Hydrology	The bay is semi-protected from the strong northwesterly winds that usually blow along the Northern California coast. Many large rocks are distributed within the bay and rocky intertidal zones are separated by periodic sandy and gravel beaches. Currents in the ASBS vary with the season. A south flowing current occurs between February and October. This current causes a clockwise and counter clockwise gyres in the northeastern and southeastern portions of the ASBS respectively. A reverse current occurs during the winter between November and February. This current occurs as a result of the northward flowing Davidson current. The northward flowing current establishes a clockwise gyres in the north and south part of the ASBS. The local current pattern tends to trap materials in a gyre southeast of the Trinidad Head in the winter . . . (Source for hydrological characterization [edited]: Mitigated Negative Declaration Trinidad Pier Reconstruction Project, Trinidad Bay, Humboldt County, August, 2007)
Geology	A geotechnical investigation of the pier was conducted between June 23rd -26th, 2007. Core borings were used to obtain four core samples from four locations along the length of the existing pier (Figure 3). Borings were advanced to depths of approximately 50 ft. (15.2m) below the mud line through the existing pier decking. Earth material observed during the subsurface investigation can be broken into two general categories, which are described below: 1. Recent marine deposits. A thin veneer (approximately 3.5 to 7.5 ft. thickness) of recently deposited loose to compact gray sand with shell fragments and other debris overlies the entire site. Some gravel size rock fragments were also observed in the cuttings (possibly derived from the adjacent Trinidad Head and Little Head). Large (2-3 ft. diameter) blocks of Franciscan material were observed at the base of both Trinidad Head and Little Head. 2. Bedrock. Bedrock of the Franciscan Formation underlies the recent marine deposits in each of our boreholes. This unit predominantly consists of gray, green, and black, weathered to decomposed mudstone, shale, and sandstone, with some zones of hard gray sandstone. As described in published mapping decomposed igneous and metamorphic rock are also likely present.

	Zones of extremely fractured slicksided rock material were found in several borings and may relate to a shear zone or the trace of the Trinidad Fault observed at the base of Trinidad Head by Woodward-Clyde (1980). (Source for geological characterization [edited]: Mitigated Negative Declaration Trinidad Pier Reconstruction Project, Trinidad Bay, Humboldt County, August, 2007)
Historical and Regulatory Review	The Trinidad Harbor has been designated an Area of Special Biological Significance (ASBS) by the State Water Resources Control Board for the kelp beds located in the bay. The kelp beds at Trinidad Harbor are 1.8 miles long and encompass 297 acres of marine habitat. The cumulative biomass of the kelp beds supports a substantial amount of marine life. The California Ocean Plan prohibits discharges containing pollutants to ASBS waters. Trinidad Bay is also designated by the California Coastal Commission as a Critical Coastal Area (CCA) and was chosen as one of the five pilot programs to address non point source pollution. The current pier decking provides a source of runoff and introduction of pollutants into the receiving waters surrounding the project area. Spills and runoff from the pier deck can be immediately washed into the surrounding receiving waters. Catastrophic spills on the pier will immediately enter the receiving waters with no opportunity for spill response. Completed testing of the pier runoff identified exceedences for standards for total coliform, E.coli, enterococcus, and TPH as gas, diesel and motor oil. Additionally, the pilings supporting the pier are creosote treated and contribute toxic creosote-derived polycyclic aromatic hydrocarbons (PAHs) to the water surrounding the site. Creosote is potentially toxic to humans. Site specific tests run the by Tribal Environmental Program confirmed that water samples taken from runoff of creosote treated pilings contained measurable quantities, exceeding California Ocean Plan Table B water quality objectives, of six creosote derived PAHs, which are toxic. The only way to eliminate these toxic building materials is to demolish the pier and remove the materials for recycle or disposal. Otherwise, the pier will eventually deteriorate and the toxic materials will fall into the ocean and drift to further contaminate the harbor as well as new locations. The ultimate goal of the project following demolition is to replace the pier using non-toxic building materials. The completed project will limit potential pollution sources to the surrounding environment by removing the pressure treated wood decking and replacing it with a concrete pier surface with a runoff collection system, and by removing the creosote

	treated pilings and replacing them with concrete pilings cast in steel casings coated with a non-reactive polymer.
Site Investiga-tion Pier Decking	The Rancheria obtained data pertinent to the toxicity of the pier decking from testing don for an ASBS Discharge Exception Application in 2006. Pier runoff samples approached or exceeded Recreational Bacteria Standards for Total Coliform, E. Coli, and Enterococci. Bioassays were also conducted on a number of species subjected to pier runoff samples. One bioassay, purple sea urchin fertilization, showed toxicity. Direct evidence of the presence of pollutants in the pier deck runoff has also been provided in a series of sampling events done in August, 2008 (generating runoff by sprayer or hose in the absence of rainfall). Results from these monitoring activities are reported in Table 1 following, with exceedences highlighted in yellow.
Findings-Pier Decking	**Table 1 Results for Vehicle-Derived Hydrocarbons** Notes: TP1, TP2, and TP3 refer to three sampling vicinities, all on the outboard half of the pier where vehicle activities are concentrated. All samples are artificially generated pier deck runoff. Blanks not reported and some negative results not reported—complete data available on request Initial sampling focused on gas/diesel. Laboratory suggested checking for motor oil on last sampling event, and hydrocarbons in this MW range appear to be the dominant hydrocarbon contaminant

Date	Sample Location	Purpose of Sample	Pollutant	Sample Results µg/L	Limit
08/06/08	Pier deck runoff at TP-1	Pre-Prop 84 app	TPH as Diesel	310	50
	TP-1 (dup)		TPH as Diesel (dup)	580	50
	TP-2		TPH as Diesel	500	50
	TP-3		TPH as Diesel	ND	50
08/13/08	Pier deck runoff at TP-1	Pre-Prop 84 app	TPH as Diesel	ND	50
	TP-2		TPH as Diesel	970	50
	TP-3		TPH as Diesel	210	50
08/20/08	Pier deck runoff at TP-1	Pre-Prop 84 app	TPH as Diesel	ND	50
	TP-2		TPH as Diesel	380	50
	TP-3		TPH as Diesel	ND	50
08/27/08	Pier deck runoff at TP-1	Pre-Prop 84 app	TPHC Diesel	91	50
			TPHC Motor Oil	2,300	170

			TPHC Motor Oil	170	170
TP-2 (duplicate)	Pre-Prop 84 app	TPHC Diesel	260	50
		TPHC Motor Oil	1800	170
TP-3	Pre-Prop 84 app	TPHC Diesel	380	50
		TPHC Motor Oil	250	170

From these results we can conclude that the pier deck demonstrates toxicity or is contaminated by the parameters indicated.

Site Investigation—Creosote-Treated Pilings

Although there is an abundance of scientific literature that clearly documents the toxicity of creosote, with particular sensitivity for sea urchin development, we undertook site-specific work to demonstrate that Trinidad Pier is a source of runoff containing creosote derivatives.

At a point where we could access one of the pilings from the floating deck of the pier, we collected a water sample from water sprayed onto the piling surface from about 4 feet above. The sample came into contact only with the piling. This sample was analyzed by the nearest lab able to do a creosote analysis (Alpha Analytical, Sparks, NV).

Findings—Creosote-Treated Pilings

The results of this sampling are in Table 2 following. Although the lab was unable to state that the sample contained creosote based on the EPA-approved method (EPA 40CFR Chapter One Pt. 261 Appendix III-- "Analyze for Phenanthrene and Carbazole; if these are present in a ratio between 1.4:1 and 5:1 Creosote should be considered present"), it did contain measurable quantities of six creosote-derived polycyclic aromatic hydrocarbons (PAHs), as shown in the Table 3. Also shown are their toxicity and ecotoxicity characterizations from MSDS sheets, if available. The 2005 California Ocean Plan Lists the limit for PAHs [30-day average] as 0.0088 µg/l. Since there is no other source for these PAHs on the pier pilings, this data is strongly suggestive of toxic creosote-derived compounds in the runoff.

Table 2. Creosote-Derived Compounds Detected from Trinidad Pier Piling Runoff, August, 2008 (Method—Semivolatile Organics by GC/MS [SW8270])

Compound detected from piling runoff	Measured Concentration	Toxicity Characterization and Source Documentation	Ecotoxicity Characterization and Source Documentation	
Napthalene	13 µg/l	May cause irritation. Toxic by inhalation or ingestion. TLV 10 ppm. Sensitizer. Possible carcinogen http://msds.chem.ox.ac.uk/NA/naphthalene.html	Ecotoxicity in water (LC50): 305.2 ppm 96 hour(s) [Trout]. http://www.sciencelab.com/xMSDS-Naphthalene-9927671	
Phenanthrene	36 µg/l	Harmful if swallowed. May be harmful if inhaled or absorbed through the skin. Skin, eye and respiratory irritant. Causes photosensitivity http://msds.chem.ox.ac.uk/PH/phenanthrene.html	Not available http://www.sciencelab.com/ xMSDS-Phenanthrene-9926453	
Carbazole	44 µg/l	Harmful by inhalation or ingestion. May be harmful in contact with skin. Suspected carcinogen [and mutagen] http://msds.chem.ox.ac.uk/CA/carbazole.html	Not available http://www.sciencelab.com/xMSDS-Carbazole-9923305	
Pyrene	14 µg/l	Harmful if swallowed. May be harmful by inhalation or through skin contact - readily absorbed through skin. Irritant. Toxicology not fully investigated. http://msds.chem.ox.ac.uk/PY/pyrene.html	Ecotoxicity in water (LC50): 1.8 mg/l 48 hours [Water flea]. http://www.sciencelab.com/ xMSDS-Pyrene-9924760	
Chrysene	17 µg/l	Toxic. Confirmed animal carcinogen, possible human carcinogen. Harmful if swallowed, inhaled or absorbed through the skin. http://msds.chem.ox.ac.uk/CH/chrysene.html	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. http://agrippina.bcs.deakin.edu.au/ bcs_admin/msds/Chemical Summary.asp?ID=517	
Fluoranthene	27 µg/l	Harmful if swallowed. Limited evidence that this may act as a carcinogen. Skin, eye and respiratory irritant. http://msds.chem.ox.ac.uk/FL/fluoranthene.html	Not available—no citation found	

Conclusions and Recommendations	The results reported above demonstrate through site specific studies at Trinidad Harbor that both the pier decking and the creosote-treated pilings are toxic materials that continue to contaminate the site at Trinidad Harbor. The only way to eliminate these toxic building materials is to demolish the pier and remove the materials for recycle or disposal. Otherwise, the pier will eventually deteriorate and the toxic materials will fall into the ocean and drift to further contaminate the harbor as well as new locations. The ultimate goal of the project following demolition is to replace the pier using non-toxic building materials. The completed project will limit potential pollution sources to the surrounding environment by removing the pressure treated wood decking and replacing it with a concrete pier surface with a runoff collection system, and by removing the creosote treated pilings and replacing them with concrete pilings cast in steel casings coated with a non-reactive polymer. Removal of 5000 exposed square feet of pressure treated decking, and 215 creosote-treated pilings, which have been found in 2008 water quality tests to still be releasing toxic creosote-derived polycyclic aromatic hydrocarbons (PAHs), will contribute measurably to the long-term health and maintenance of the surrounding environment. The cleanup, removal and recycling of hazardous debris from the existing pier and the pier replacement with non-toxic materials are the most significant actions that the Trinidad Rancheria can take to remove toxic materials and consequent pollutant discharges into Trinidad Harbor.
Precautions	No additional precautions are expected to be necessary in regard to the overall harbor site, based on a Phase I Environmental Site Assessment completed in May 1999, performed in accordance with American Society for Testing and Materials (ASTM) Standard No. E1527-94 by Winzler & Kelly Consulting Engineers. This report resulted in a Site Investigation and corrective action for an underground storage tank located at the site. The corrective action was in compliance with the requirements of subdivisions (a) and (b) of Section 2529.77 of the Health and Safety Code and resulted in a Remedial Action Completion Certification from the Humboldt County Division of Environmental Health. In regard to the removal of the creosote-treated pilings, the Trinidad Pier Reconstruction Project Biological Assessment (April 11, 2008) requires the following measures to reduce contaminant release to less-than significant levels: For the potential impacts due to suspension of sediment and release of contaminants in from the ocean floor, pile removal through vibratory extraction may cause temporary turbidity due to sediment suspension and contaminant release. However, this method is documented to have less adverse impact EFH and salmonid fish species than other commonly used methods and it is the NOAA Fisheries recommended method to reduce impacts (NOAA Fisheries 2003). Mitigation measures that should be implemented to minimize harmful impacts of this activity on fish species include the following: use vibratory extraction rather than direct pull or

	"clamshell" methods to remove piles, and initiate removal with a lesser impact vibration to break bond between sediment and pile. Because creosote may be harmful to fish, marine mammals and birds, removal of the creosote-treated piles must be monitored for any contamination on the water-surface of creosote oils. A containment boom will be employed around the work area to capture and remove any debris or noticeable oil from the creosote-treated piles. Additionally, the water surface will be observed for any sheen associated with oil contamination, and if seen, oil absorbent materials will be used to remove all oil residues.