

**SIXTH FIVE-YEAR REVIEW REPORT FOR
COAST WOOD PRESERVING SUPERFUND SITE
MENDOCINO COUNTY, CALIFORNIA**



PREPARED BY
U.S. Army Corps of Engineers
FOR
U.S. Environmental Protection Agency
Region 9

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Executive Summary

This is the sixth Five-Year Review of the Coast Wood Preserving Superfund Site (Site) located in Mendocino County, California. The purpose of this Five-Year Review is to review information to determine if the remedy is and will continue to be protective of human health and the environment.

The Site covers approximately 8 acres and is located at the southwest corner of Taylor Drive and Plant Roads on the southern side of Ukiah, California. The facility is bordered by open fields to the south and southeast, industrial properties to the north and east, and U.S. Highway 101 to the west. Prior to 1989, past operations and a lack of engineering controls caused a release of chromium and arsenic into the Site soils and aquifers.

In the 1989 Record of Decision, the U.S. Environmental Protection Agency selected remedies for soil and contaminated groundwater to protect long-term human health and the environment. The following remedies were selected:

- Surface runoff management and control to prevent potentially contaminated water from entering surface water drainage features
- Control and remediation of contaminated soil
- Plume control and aquifer remediation
- Electrochemical treatment of groundwater
- In-situ treatment of groundwater using calcium polysulfide reductant
- Water recycling/discharge to Ukiah sewage treatment plant or reinjection
- Monitoring

Hydraulic control and groundwater remediation (electrochemical treatment) through the use of a pump and treat system and a slurry wall was conducted on-Site from 1983 to 1999. In 1999, the pump and treat method was replaced with an in-situ technology which includes injection of a reductant. Reductant injection stopped in 2010 with the concurrence of the California Department of Toxic Substances Control due to significant reduction in chromium concentrations on-Site. Remedial actions have continued by infiltration of reductant with the use of infiltration trenches upgradient of the slurry wall.

Hexavalent chromium and total chromium contamination in groundwater currently remains above their respective cleanup levels in a few isolated areas. Concentrations have fluctuated during this review period, possibly associated with seasonal variation in groundwater levels. Only two wells had arsenic concentrations exceeding cleanup levels during this review period. These wells are located near the most recent injection which occurred in 2010, and contamination is expected to decline and not migrate off-Site. Concentrations of contaminants are expected to decline over time as a result of past injections. Currently, these contaminants are either decreasing or show no trend in concentrations over the last five years. Groundwater collected from the downgradient perimeter of the Site is below the current maximum contaminant level standards which indicates that contamination is not migrating off-Site.

The remedy for the Site is functioning as intended. The remedial actions for soils have been completed, and groundwater monitoring continues. A Land Use Covenant ensures that the current and future land use stays non-residential, eliminates possible future exposure pathways, and protects the existing remedy. No human health or ecological routes of exposure have been identified or changed in a way that could affect the protectiveness of the remedy. The remedy is progressing as expected towards meeting completion of the remedial actions. No new information has come to light that would affect the protectiveness of the remedy at the Site.

The remedy at the Coast Wood Preserving Site currently protects human health and the environment because the remedy is functioning as intended and no complete exposure pathways to contaminated media exists. An asphalt/concrete cap covers the entire Site, eliminating direct contact exposure to arsenic- and chromium-contaminated soils and preventing leaching of contaminants into groundwater. Groundwater monitoring to evaluate progress towards cleanup goals is ongoing. A Land Use Covenant, which was filed and recorded with the County of Mendocino in 1989, requires the maintenance of an asphalt or concrete cap over the Site and restricts the use of the property to non-residential purposes. In order to ensure that the site is protective in the long-term, EPA will conduct a site inspection when EPA's COVID travel restrictions are lifted.

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List of Abbreviations

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
DTSC	California Department of Toxic Substances Control
EPA	U.S. Environmental Protection Agency
ESD	Explanation of Significant Differences
mg/L	milligrams per liter
mg/kg	milligrams per kilogram
ROD	Record of Decision
RSL	regional screening levels
Site	Coast Wood Preserving Superfund Site
µg/L	micrograms per liter
USACE	United States Army Corps of Engineers

1. Introduction

The purpose of a Five-Year Review is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this Five-Year Review pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act Section 121, 40 Code of Federal Regulation Section 300.430(f)(4)(ii) of the National Contingency Plan and EPA policy.

This is the sixth Five-Year Review for the Coast Wood Preserving Superfund Site. The triggering action for this statutory review is the completion of the previous Five-Year Review: September 15, 2016. The Five-Year Review has been prepared due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

The Coast Wood Preserving Site is addressed in the Remedial Action Plan (1989) under the direction of the California Department of Toxic Substances Control (DTSC) in conformance with: Section 13000 and 13304 of the California Water Code, State of California Health and Safety Code Section 25356.1 and the Comprehensive Environmental Response, Compensation, and Liability Act. The Record of Decision (ROD) was signed on September 29, 1989, accepting the Remedial Action Plan as the remedy.

In December 2017, DTSC, EPA, Coast Wood Preserving, and Environmental Liability Transfer, Inc. signed a Consent Decree for the transfer of cleanup responsibility to Environmental Liability Transfer, Inc., and the United States District Court in the Eastern District of California approved the Consent Decree on March 1, 2018. On June 8, 2018, Environmental Liability Transfer, Inc. became the new owners of Coast Wood Preserving.

The Coast Wood Preserving Superfund Site Five-Year Review was led by Tu Nguyen of EPA Region 9 and Cynthia Wetmore, EPA Region 9 Superfund Five-Year Review Coordinator. The U.S. Army Corps of Engineers participants included: Rebecca Rule-Program Manager, Deborah Johnston-Technical Lead, and Travis Kelsay-Lead Geologist. The review began at the project kickoff meeting on November 12, 2020.

Table 1. Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Coast Wood Preserving Superfund Site		
EPA ID: CAD063015887		
Region: 9	State: CA	City/County: Ukiah/Mendocino
SITE STATUS		
National Priorities List Status: Final		
Multiple Operable Units? No	Has the site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: State <i>[If "Other Federal Agency", enter Agency name]:</i>		
Author name (Federal or State Project Manager): Tu Nguyen		
Author affiliation: U.S. Environmental Protection Agency, Region 9		
Review period: 11/12/2020 - 6/21/2021		
Date of site inspection: N/A		
Type of review: Statutory		
Review number: 6		
Triggering action date: 9/15/2016		
Due date (five years after triggering action date): 9/15/2021		

1.1. Background

The Site occupies eight acres and is located at 3150 Taylor Drive, Ukiah, California (Figure 1). The Site is bordered by the Mendocino Solid Waste Management Authority to the south, industrial properties to the east, the Ukiah sewage disposal facility to the north, and U.S. Highway 101 to the west. Coast Wood Preserving conducted wood preserving operations at the Site beginning in 1971. The mix used in the chemical preserving operation consisted of sodium dichromate, copper sulfate, and arsenic acid. Wood was bathed in a dilute solution of chromated copper arsenate in a pressurized retort chamber (near the western Site boundary). Cumulative drippings from the treated wood over the years are believed to have resulted in near-surface soil contamination at the Site.

Several investigations, beginning in 1980, were performed to delineate the areal and vertical extent of chromium in soil and groundwater at the Site. Elevated chromium (predominantly chromium (III) and to a minor extent hexavalent chromium) and arsenic concentrations were found in the upper 1 to 2 feet of soil around the retort area. The investigations found chromium concentrations exceeding the drinking water standard of 0.05 milligrams per liter (mg/L) near the retort area.

In 1983, the EPA placed Coast Wood Preserving on the National Priorities List. However, the California Department of Toxic Substances Control has been the lead regulatory agency for the investigation and cleanup pursuant to Section 26355.5 (a)(1)(B) of the California Health and Safety Code. The Department of Health Services (precursor to DTSC) issued a Remedial Action Order, Docket No. HAS 88/89-015, on December 16, 1988 to require Coast Wood Preserving to implement a Remedial Action Plan.

1.2. Physical Characteristics

The Site is located in the Ukiah Valley bounded by mountains to the east and west. It is in Section 33, Township 15 North, Range 12 West relative to the Mount Diablo Meridian. It is just south of Ukiah, California, and the Ukiah sewage disposal facility. The natural topography of the Site is generally flat with a gentle slope from west to east towards the Russian River. Portions of the Site are located over two culverted streams at a point 0.5 miles upstream of where they meet the Russian River. Robinson Creek, which is a tributary to the Russian River (0.6 miles east), is approximately 0.79 miles south of the Site.

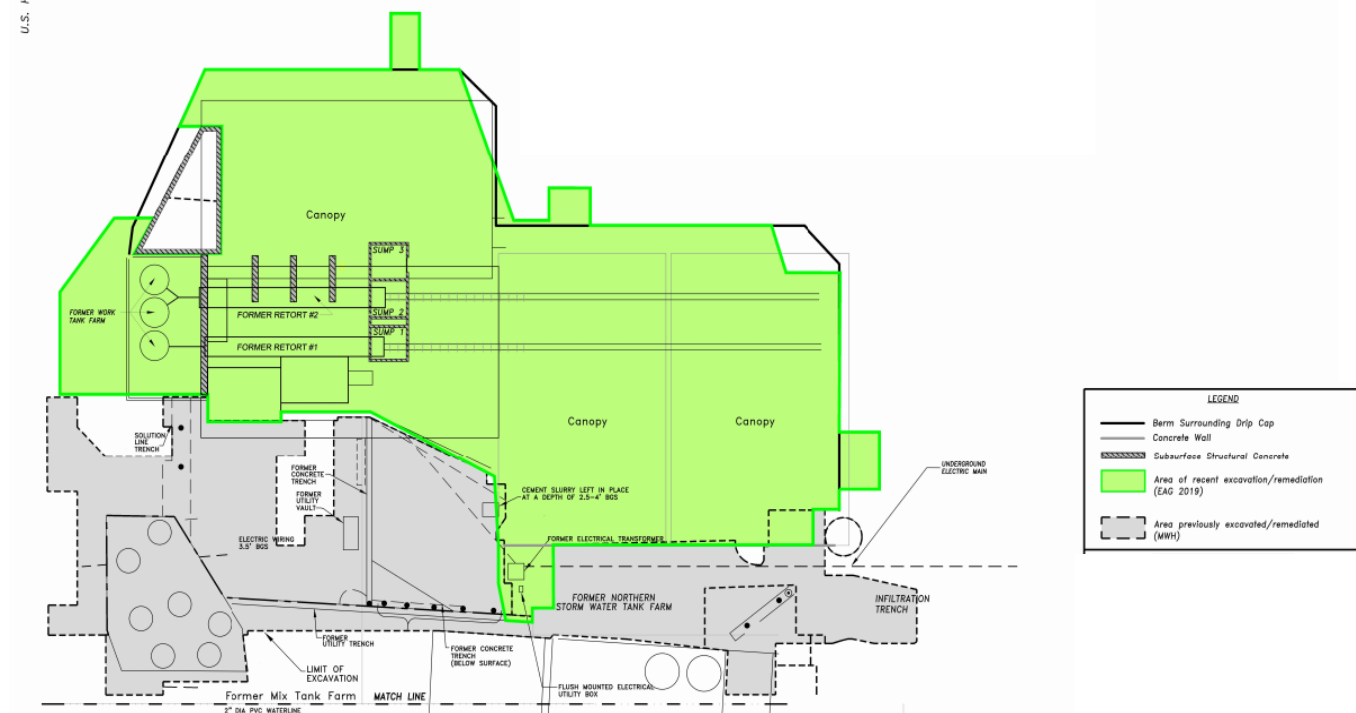
The majority of the Site is currently surfaced with either an asphalt or concrete cap, except for the recent excavation area. The area surrounding the Site is industrial and agricultural. The nearest residents are located west of Highway 101 approximately 0.25 miles from the Site. The current and projected land use for the area surrounding the Site is non-residential and agricultural.

Residents and businesses in the unincorporated area south of Ukiah get their water from the Willow County Water District, which draws its supplies predominately from Lake Mendocino. The Willow County Water District has five supply wells, which are only used during dry months. Three of the five supply wells are located approximately one-half mile north of the Site upgradient of the groundwater flow. The City of Ukiah's primary water source is the underflow from the Russian River, which is classified as Ground Water under Direct Influence for Surface Water. There are four groundwater sources located at various points within the City limits, three domestic wells in Township 15N, Range 12W,

Section 33 Mount Diablo Meridian, and one located in Township 14N, Range 12W, Section 4 Mount Diablo Meridian.



Figure 1. Location Map for Coast Wood Preserving



Source: Remedial Action Plan Implementation Report Final Draft 9 Jan 2020

Figure 2. Coast Wood Preserving Infrastructure (when in operation)

1.3. Hydrology

The Russian River originates in Central Mendocino County, flows south to Sonoma Coast State Beach, and is located approximately 2,000 feet to the east of the Site. It supplies municipal, domestic, and agricultural water to Ukiah and the surrounding areas. The Coast Wood Preserving Site is in a groundwater recharge zone. The groundwater supplies domestic, agricultural, and industrial water.

The site-specific geology consists of four hydrostratigraphic zones:

Zone 1 comprises a predominantly clayey silt layer with permeable stringers and lenses of sand and gravel that are part of the fluvial outwash deposits of the Russian River. The lateral migration through this zone of fluvial deposits appears to be limited to the irregular, more permeable sand, and gravel lenses, while vertical migration through this clayey silt layer is believed to be very slow. Zone 1 extends down to approximately 20 ft below ground surface (bgs).

Zone 2 comprises a sand and gravel layer that has been referred to as the “deep zone.” This sand and gravel layer varies from approximately 5 to 10 ft thick and between depths of 18 and 25 ft bgs. This layer contains appreciable amounts of silt and clay that is dense and slightly cemented in some areas. From observations made during the August 2020 investigation, this zone contains considerably more silt than sand and the permeability of this layer is relatively low.

Zone 3 comprises a stiff clay approximately 5 ft thick which acts as a barrier to Zone 4 and contributes significantly to reducing the potential vertical migration of hexavalent chromium. It is found starting at depths between 23 and 25 ft bgs.

Zone 4 is a cemented silty sand and clayey sand/gravel layer. The vertical extent of this zone is not known.

Irrigation groundwater wells located east of the Site across the Russian River have water depths from 75 to 100 feet. However, a monitoring well near the Site found the static water level averaged between 8 to 20 feet bgs, indicating that groundwater can be found in any of the zones and provide a pathway for contaminant migration.

2. Remedial Actions Summary

2.1. *Basis for Taking Action*

Groundwater and soil contamination occurred in the process of using chromated copper arsenate for wood preserving due to drippings or spillages. Groundwater underlying and adjacent to the Site is contaminated with hexavalent chromium, total chromium, and arsenic¹.

In 1972, the California Department of Fish and Game notified the Regional Water Quality Control Board that runoff, possibly containing chromated copper arsenate, was being discharged via surface water into tributaries of the Russian River. The Regional Water Quality Control Board first issued abatement orders to Coast Wood Preserving in 1972 to control Site contamination. In January 1973, Coast Wood Preserving complied with orders to pave the Site. In December 1981, the Regional Water Quality Control Board installed off-Site monitoring wells to the east of the Site (in the direction of the Russian River). The analysis of groundwater samples confirmed that off-Site migration of chromium had occurred. The identified potential pathways of exposure were inhalation and direct contact with the contaminated soil, ingestion of contaminated groundwater, and ecological exposures due to contact with surface water.

2.2. *Remedy Selection*

Prior to EPA selecting a remedy for the Site, Coast Wood Preserving, Inc implemented a number of remedial measures including constructing surface water run-off berms, paving over exposed soil zones, and constructing roofs over the retort areas to reduce the potential for additional soil, storm water and groundwater contamination. In 1983, without regulatory agency approval, Coast Wood Preserving constructed a 300-foot slurry cutoff wall along the eastern boundary of the site.

¹ Copper was identified as a potential site contaminant. The 1989 Remedial Action Plan states that chromium and arsenic are the "primary contaminants or indicator chemical" and that "chromium and arsenic have been selected as the indicator parameters based on their occurrence in soil and groundwater, their behavior, and their toxicity.

In August 1989, DTSC prepared and approved remedial actions for the Site in the Remedial Action Plan. EPA selected the remedy for soil and groundwater contamination consistent with DTSC's 1989 Remedial Action Plan in the September 1989 ROD.

Specifically, the major components of the remedy are:

- Paving of exposed soils to prevent surface water infiltration and reduce the potential for the leaching of chromium from soils to groundwater;
- On-site treatment of contaminated soils, after the closure of the Site, using the best available technology to provide a permanent cleanup remedy;
- Plume control of the aquifer using strategically located extraction wells to pump contaminated water from the affected aquifer;
- Electrochemical treatment of extracted groundwater to permanently remove metal contamination in order to comply with both State and Federal cleanup standards;
- Utilization, recycling, and/or discharging of treated water to the Ukiah Sewage Treatment Plant facility for disposal of treated water; and,
- Implementation of a groundwater monitoring plan to ensure the effectiveness of the Remedial Action Plan and to provide data to identify any additional action needs or potential problems

In July 1999, DTSC approved, with EPA's concurrence in a letter dated August 25, 1999, an amendment to the 1989 Remedial Action Plan, which changed the remedial action for groundwater from extraction and treatment to in-situ reduction and fixation of hexavalent chromium via direct injection into the groundwater and infiltration of calcium polysulfide reductant with the use of infiltration trenches upgradient of the slurry wall.

In August 2003, DTSC prepared and EPA concurred with an Explanation of Significant Differences (ESD). The ESD revised the cleanup goals for hexavalent chromium and arsenic in soil to 42 milligrams per kilogram (mg/kg) and 27 mg/kg, respectively. The ESD modified the timing and the scope of the soil remediation. The Remedial Action Plan anticipated that soil cleanup would not be undertaken until the cessation of wood-preservation activities at the Site. In 2003, Coast Wood Preserving proposed that some accessible contaminated soil could be remediated during plant operation due to upgrades that were being made. The ESD documented the modification of the scope and timing of soil cleanup. The 2003 ESD included a requirement for a deed restriction to prevent residential use on the property.

Table 2. Soil and Groundwater Cleanup Levels from 1989 ROD or the 2003 ESD

Chemical	Cleanup Levels Soils (mg/kg)	Cleanup Levels Groundwater (µg/L)	Basis for Groundwater Cleanup Level ¹
Total Chromium	100 ²	50	State drinking water standard
Hexavalent Chromium	42 ²	--- ⁴	State drinking water standard
Arsenic	27 ³	10	State drinking water standard

¹. The more stringent of the Federal or State drinking water standard was selected as the basis for the groundwater cleanup level.

². The cleanup goals for total and hexavalent chromium in soil are based on preventing exceedance of the California drinking water standard in groundwater through the potential leaching of chromium from soil.

³. Arsenic soil cleanup level is risk-based for commercial/industrial with a health risk of 10⁻⁵ (letter from DTSC dated March 27, 2002).

⁴ The California standard for Hexavalent chromium in drinking water was removed due to the May 31, 2017 ruling in California Manufacturers & Technology Assn., et al. v. State Water Resources Control Board (Superior Ct. Sacramento County, 2017, No. 34-2014-80001850).

The remedy for soil and groundwater contamination selected in DTSC's 1989 Remedial Action Plan and EPA's 1989 ROD included paving the Site with an asphalt or concrete cap to prevent run-off and leaching of wood treatment solutions to the subsurface; installation of a downgradient slurry wall; groundwater extraction, treatment and reinjection; and soil excavation with off-Site disposal after plant closure. Institutional controls were implemented at the Site through a Land Use Covenant between DTSC and Coast Wood Preserving, which imposes a limitation on the Site for non-residential use only.

2.3. Remedy Implementation

Prior to the 1989 ROD, interim measures were implemented by Coast Wood Preserving to prevent and control surface runoff. This was done by constructing berms and paving the Site to minimize contaminated runoff, eliminate infiltration, and reduce leaching of contaminants into the groundwater. In addition, roofs were constructed over the retort area. Coast Wood Preserving installed a 300-foot bentonite slurry cutoff wall (20 feet deep) to contain the chromium-impacted groundwater and began groundwater extraction and treatment in response to the documentation of the chemical plume moving off-Site in 1983. A groundwater extraction trench (15 ft long, 18 ft deep, 2 ft wide) was placed upgradient of the slurry wall where contaminated water could be pumped and treated at an on-Site electrochemical treatment facility. Infiltration trenches on-Site were constructed in 1985.

Institutional controls were implemented in the form of a Land Use Covenant that was recorded with the County of Mendocino on December 20, 1989 between DTSC (then Department of Health Services, Toxic Substances Control Division) and Coast Wood Preserving. Restrictions on use of the property include: maintaining the asphalt or concrete cap until such time as the soil remediation has begun in accordance with the Remedial Action Plan and Remedial Design; a requirement to obtain approval of DTSC 30 days prior to any earthmoving actions; handling all materials excavated as hazardous wastes; no drilling of

production wells without prior written approval of the DTSC; and, a prohibition on the use of on-Site buildings for: a hospital, a school for persons under 21 years of age, a day-care center, or any permanently occupied human habitation other than for industrial purposes.

In 2002, Coast Wood Preserving ceased using the chromated copper arsenate solution for wood preservation activities and began soil excavation activities in accordance with the Remedial Action Plan. Coast Wood Preserving excavated and disposed of approximately 8,218 tons of contaminated material between 2002 to 2006. In 2015, an additional 42 cubic yards of contaminated material were excavated and disposed off-site. Coast Wood Preserving excavated and disposed of approximately 3,700 tons of impacted soil in 2019. The general areas of excavation in 2019 are shown on Figure 2.

Reductant injection was conducted on eight separate occasions between September 1999 and 2010 and again in January 2015 and February 2016. In February 2020, three additional groundwater monitoring wells (CWP-123, CWP-124, and CWP-125) were installed at the Site in order to monitor concentrations of hexavalent chromium and arsenic within and downgradient of the former production area and area of the final soil remediation activity.

Since 1990, no groundwater contamination above the arsenic or total chromium drinking water standard has been detected beyond the Coast Wood Preserving property boundary.

Table 3. Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, engineered controls, and areas that do not meet standards based on current conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater/soil	Yes	Yes	Entire Site	Impose a limitation on the Site specifying non-residential use only. Eliminate the possible use of groundwater for residential purposes (i.e., drinking and bathing). Restriction on any proposed earth work or other activities that may disturb the asphalt cap, including the development of groundwater wells.	A land use covenant was recorded on November 29, 1989

2.4. System Operations/Operation and Maintenance

Coast Wood Preserving transferred ownership of the company on June 8, 2018, and ceased wood preserving activities, site inspections and maintenance. The wood preserving machinery and supporting

facilities were decommissioned or sold and removed from the Site. There are currently no full-time or part-time workers present on-Site.

In June 2020, EnviroAnalytics Group, an engineering consultant group hired by Environmental Liability Transfer, submitted an Operations and Maintenance Plan which presents the policies and procedures for long-term operation, maintenance, and monitoring at the Site. In addition, it presents guidelines related to management of soil where potential residual impacts of contaminants may reside. Activities that intrude into potentially impacted soil are to be conducted in accordance with the Soils Management Plan. Response actions, if needed, and long-term operations and maintenance activities will continue to be conducted under DTSC oversight until groundwater meets cleanup goals and the Site is deleted from the National Priorities List.

The primary objective described in the Operations and Maintenance Plan is to prevent uncontrolled exposures to potentially impacted soil and groundwater and to fulfill groundwater monitoring and inspection related to the land use controls attached to the deed for the Site. The Operations and Maintenance Plan includes:

- Guidelines for management of soil disturbances beneath or adjacent to previously remediated areas where potential contaminants may be encountered,
- A checklist for the annual inspection program to ensure proper use of the Site,
- Criteria for evaluating the groundwater monitoring and reporting program and existing groundwater treatment system should groundwater concentrations increase from recently observed levels.

The groundwater monitoring and reporting program consisted of semi-annual monitoring in 2020 followed by annual monitoring in 2021 and beyond. The current groundwater monitoring and reporting program consists of gauging 21 monitoring wells and sampling 19 of these wells.

3. Progress Since the Last Five-Year Review

3.1. *Previous Five-Year Review Protectiveness Statement and Issues*

The protectiveness statement from the 2016 Five-Year Review for the Coast Wood Preserving Site stated the following:

The remedy at the Coast Wood Preserving Superfund Site currently protects human health and the environment because the remedy is functioning as intended and no exposure pathways to contaminated media exist. However, in order for the remedy to be protective in the long term, an assessment of the current remedy should occur considering site-specific risk for hexavalent chromium and a determination made for whether it is appropriate to modify the remedy to include the new MCL.

The 2016 Five-Year Review included one issue and recommendation.

Table 4: Status of Recommendations from the 2016 Five-Year Review

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description
1	The groundwater cleanup goal for hexavalent chromium is listed as 50 µg/L; however, the current California drinking water standard is 10 µg/L.	Evaluate current remedy considering site-specific risk for hexavalent chromium and consider whether it is appropriate to modify the remedy to include the new drinking water standard.	Considered But Not Implemented	The drinking water standard for hexavalent chromium in California was removed in accordance with the court ruling dated May 31, 2017.

On July 1, 2014, a California drinking water standard of 10 parts per billion (ppb) for hexavalent chromium became effective. The drinking water standard was issued by the California Department of Public Health right before its division of drinking water transferred jurisdiction to the State Water Resources Control Board (State Water Board). On May 31, 2017, the Superior Court of Sacramento County issued a judgment invalidating the drinking water standard on the basis that the California Department of Public Health had not properly considered the economic feasibility of complying with the drinking water standard. As part of the next steps in reissuing a drinking water standard for hexavalent chromium, the State Water Board involved stakeholders in developing options for evaluating economic feasibility during the process in 2020 and plans to publish a Notice of Proposed Rulemaking in 2021.

3.2. Work Completed at the Site During this Five-Year Review Period

Coast Wood Preserving ceased wood treatment operations at the facility in June 2018. The new owner of Coast Wood Preserving, Environmental Liability Transfer, began soil characterization activities beneath the canopies of the former production area and drip-pad in November 2018 and March 2019. The soil characterization activities led to the execution of the final soil remediation for the Site between August and November 2019. The excavation removed more than 3,700 tons of material including the paved former drip-pad, underlying fill and soil impacted by arsenic and hexavalent chromium. Confirmation soil samples collected from the excavation floor and sidewalls demonstrated that the cleanup goals were met. DTSC approved the Remedial Action Plan Implementation Completion Report and acknowledged that remediation efforts satisfied the cleanup goals for soil remediation in a letter dated February 24, 2020.

The State Water Board approved stopping stormwater sampling on June 1, 2017, in anticipation of wood preserving operations being discontinued.

In the 2018 Second Annual Groundwater Monitoring report (submitted in April 2019), the monitoring contractor proposed to remove ammonia, calcium, and laboratory pH measurement (i.e., substituting field measured pH for laboratory measured pH). This change was approved in an email from Keith Baldanza of the California Regional Water Quality Board dated April 5, 2019. The 2019 First Semi-Annual Groundwater Monitoring Report suggested the cessation of sampling of additional wells from the 2012 Monitoring and Reporting Program due to consistent results below the cleanup objectives and/or redundancies in sampling locations. The DTSC and EnviroAnalytics Group eventually concluded that the

exclusion of six wells was acceptable. Currently, 21 groundwater monitoring wells comprise the Monitoring and Reporting Program, of which 19 were sampled during this review period.

In February 2020 three groundwater monitoring wells (CWP-123, CWP-124, and CWP-125) were installed at the Site in order to monitor concentrations of hexavalent chromium and arsenic within and downgradient of the former production area and area of the final soil remediation activity. A nested pair of groundwater monitoring wells (CWP-124 and CWP-125) were installed within the extent of the excavation area and close to the former sumps and retort openings of the production area. CWP-124 is screened from 5 to 10 ft bgs and monitors groundwater conditions in Zone 1. Well CWP-125 is screened from 15 to 20 ft bgs, and the lack of recharge during bailing of the well suggests that the screened interval lies within a low permeability zone suspected to be Zone 3.

Elevated concentrations of hexavalent chromium were detected in groundwater from each of the wells (CWP-123, CWP-124, and CWP-125), and so further delineation of hexavalent chromium impacts beneath the canopied area was approved by DTSC in June 2020. EnviroAnalytics Group personnel conducted the groundwater delineation activities between August 11 and August 14, 2020. A final report was submitted in October 2020 detailing the results of the delineation activities.

4. Five-Year Review Process

4.1. Community Notification

A public notice was made available in the *Ukiah Daily Journal* on March 30, 2021, stating that there was a Five-Year Review and inviting the public to submit any comments to the EPA. No comments were received. The results of the review and the report will be made available at the Site information repository located at Mendocino County Library, 105 N Main Street, Ukiah, or California Department of Toxic Substances Control File Room, 700 Heinz Avenue, Berkeley, and on the Site's official webpage (<https://cumulis.epa.gov/supercpad/SiteProfiles/index.cfm?fuseaction=second.cleanup&id=0901489>) .

4.2. Data Review

4.2.1. Soil

The remedial excavation of arsenic- and hexavalent chromium-impacted soil, from below the former production area roughly defined by the canopied area, was completed in 2019. Confirmation soil samples collected at the extent of the excavation floor and sidewalls demonstrated that the cleanup goals were met (110 samples-81 floor samples, 29 sidewall samples). Of the 81 floor samples, 79 met the cleanup objective of 27 mg/kg for arsenic in soil and 78 met the cleanup objective of 42 mg/kg in soil for hexavalent chromium. Of the 29 sidewall samples, 27 met the cleanup objective for arsenic and 28 met the cleanup objective for hexavalent chromium. Confirmation soil samples collected at the extents of the excavation floor and sidewalls demonstrate that the cleanup goals have been met with a few exceptions where individual samples slightly exceed the cleanup goals, but the 95% upper confidence level remained considerably below the cleanup goals. The calculated upper confidence limit for the entire sample set was 4.91 mg/kg for arsenic and 18.95 mg/kg hexavalent chromium. DTSC provided acceptance that the soil

remediation effort satisfied the cleanup goals of the soil remediation decision documents (letter dated February 24, 2020).

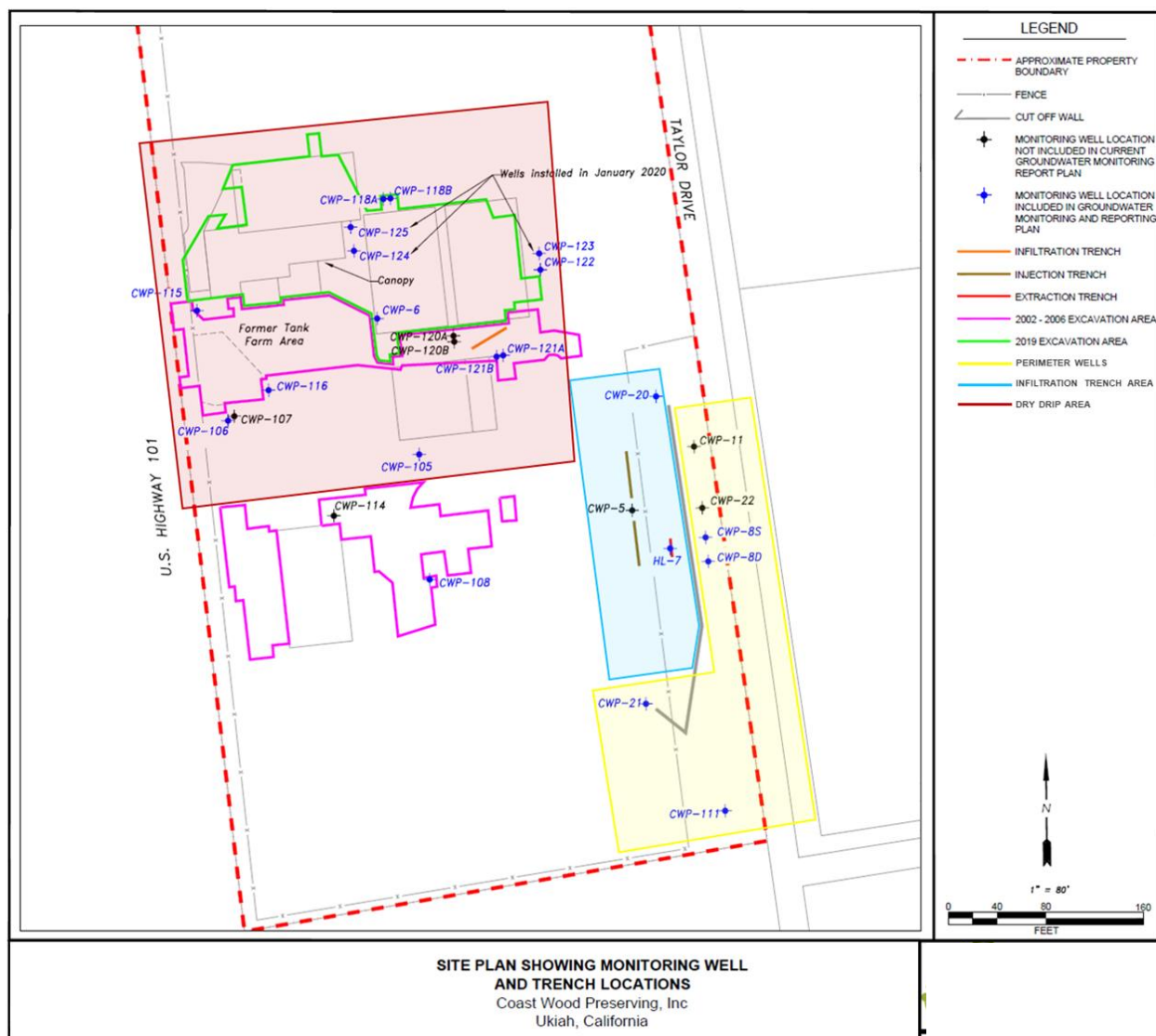
4.2.2. Groundwater

To date, the groundwater monitoring and reporting program has included performing water level measurements, well purging, and the collection of groundwater samples for chemical analysis of dissolved chromium, arsenic, and other parameters related to the remedial actions for the Site. The current groundwater monitoring and reporting program is based primarily on the monitoring and reporting program adopted in 2012.

The three additional groundwater monitoring wells CWP-123, CWP-124, and CWP-125 (Figure 3) were installed within and downgradient of the former production area and area of the final soil remediation activity. Well CWP-123 was paired with well CWP-122. Well CWP-122 is screened from 11.5 to 16.5 ft bgs and monitors groundwater conditions in Zone 1, while CWP-123 is screened from 20 to 25 ft bgs and monitors groundwater conditions in Zone 2. Wells CWP-124 and CWP-125 are paired together beneath the canopied area in close proximity to the former retorts. CWP-124 is screened from 5 to 10 ft bgs and monitors groundwater conditions in Zone 1. Well CWP-125 is screened from 15 to 20 ft bgs, and the lack of recharge during bailing of the well suggests that the screened interval lies within a low permeability zone suspected to be Zone 3. The newly installed wells have been included in the updated groundwater monitoring and reporting program, which currently consists of 19 sampled wells. Beginning in 2021 the groundwater monitoring and reporting program will move to annual sampling during the second quarter.

For purposes of assessing progress of the remedy, wells of interest were divided into three categories by area: the Dry Drip Area, the Infiltration Trench Area, and the Perimeter Wells Area (Figure 3). These areas are in the central, central southeast, and east/southeast parts of the Site, respectively.

Out of the 19 sampled wells, five wells had exceedances of cleanup levels for total chromium, three for hexavalent chromium, and three for arsenic. Wells that have been sampled less than four times were not statistically evaluated due to either insufficient sampling results above the detection limits or because all detected concentrations were below the cleanup goal. The wells selected and the results of the analysis are shown in Table 5.



Source: EnviroAnalytics Group June 2020 First Semi-Annual Groundwater Monitoring Report (modified).

Figure 3. Site Plan Showing Monitoring Wells and Trench Locations

The concentration trends of wells are predominantly decreasing, stable, or had no trends during the review period. The groundwater in wells CWP-6, CWP-116, CWP-118A, CWP-120A, and CWP-20 had either stable concentrations or no trends consistently above cleanup levels during the review period. The new wells, CWP-124, and CWP-125, while having the highest total chromium and hexavalent chromium concentrations, did not have enough data for statistical analysis. Both new wells and the other wells for which trend analysis could be performed (except CWP-20) are in the Dry Drip Area.

CWP-20 is located in the Infiltration Trench Area, directly upgradient of the slurry wall along with HL-7, which last exceeded the total chromium and hexavalent cleanup levels in April 2015. Despite not exceeding cleanup levels, HL-7 has a probably increasing trend for chromium and an increasing trend for

hexavalent chromium over the last five years. However, it does not show an increasing trend for either constituent over the last 10 years. It is important to note that these measurements were only observed in one of the current sampling wells in the Infiltration Trench Area and are not valid for drawing conclusions over the entire Site.

Contamination of groundwater is above cleanup levels on-Site, most notably in or around the Dry Drip Area. There is no exposure pathway; the groundwater at the Site is not being used for any purpose, and arsenic and total chromium concentrations above drinking water standards are not migrating off-Site based on the boundary well data. The wells that comprise the current groundwater monitoring plan are sufficient in number and appropriately placed to monitor the concentrations and mobility of contaminants at the Site. Beyond the trench, concentrations of total chromium are below cleanup levels.

For purposes of assessing progress of the remedy, wells of interest were divided into three categories by area: the Dry Drip Area, the Infiltration Trench Area, and the Perimeter Wells Area (Figure 3). These areas are in the central, central southeast, and east/southeast parts of the Site, respectively.

Out of the 19 sampled wells, five wells had exceedances of cleanup levels for total chromium, three for hexavalent chromium, and three for arsenic. Wells that have been sampled less than four times were not statistically evaluated due to either insufficient sampling results above the detection limits or because all detected concentrations were below the cleanup goal. The wells selected and the results of the analysis are shown in Table 5.

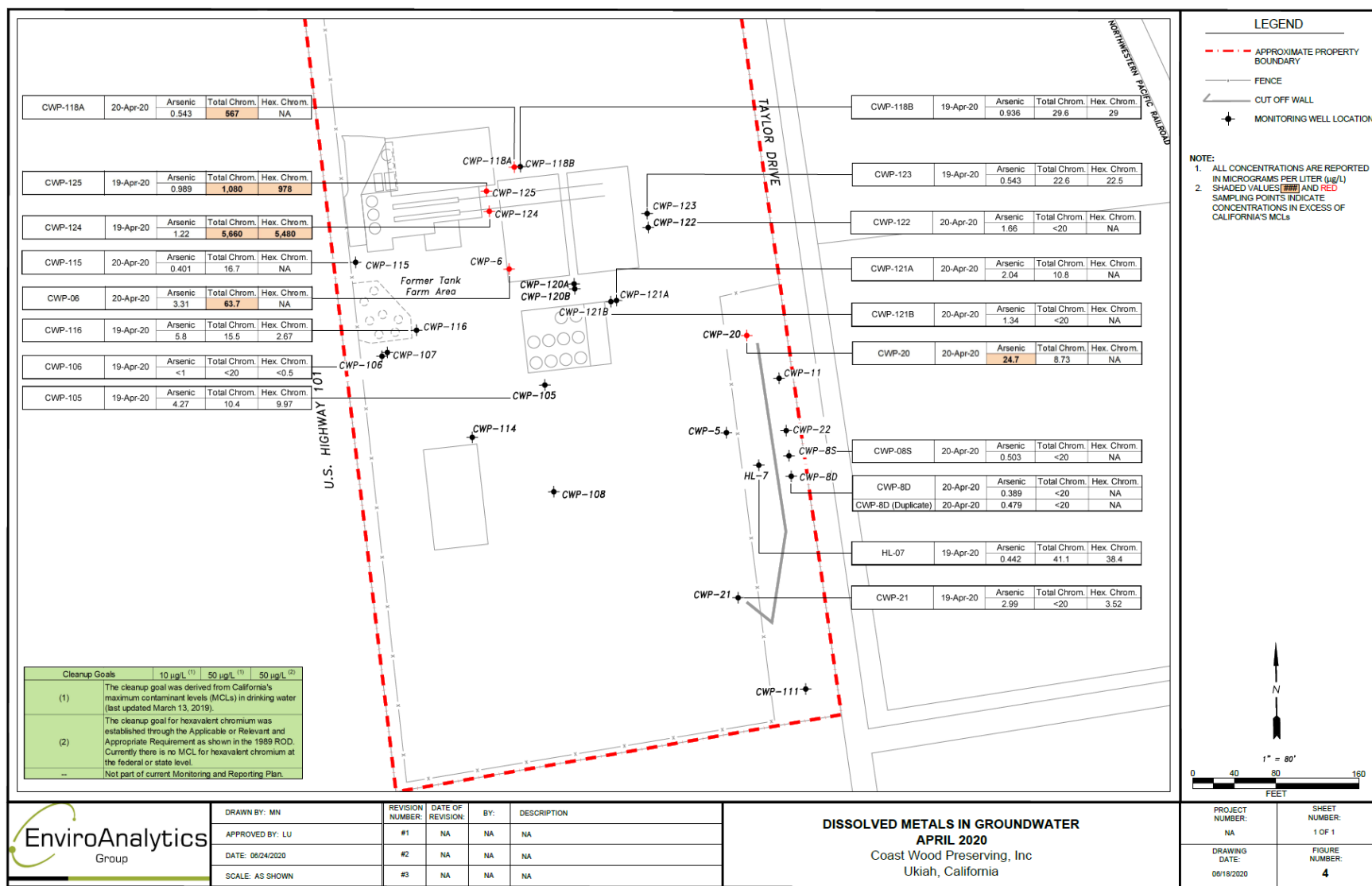


Table 5. Mann-Kendall Trend Analysis for Site Contaminants

Well	Contaminant	Cleanup Level (µg/L)	Number of Exceedances/ Sampling Events ¹	Maximum Concentration (µg/L)	Date of Highest Concentration	Mann-Kendall Statistics (S) ²	Coefficient of Variation (COV) ³	Confidence in Trend ⁴	Concentration Trend
Dry Drip Area Wells									
CWP-6	Total Chromium	50	5/7	170	27-Mar-18	3	0.70	61.4%	No Trend
CWP-116	Arsenic	10	1/9	19	11-Nov-19	8	0.78	76.2%	No Trend
	Total Chromium	50	5/9	230	11-Nov-19	9	0.79	79.2%	No Trend
CWP-118A	Total Chromium	50	10/10	2700	22-Jun-16	-17	0.69	92.2%	Prob. Decreasing
	Hexavalent Chromium	50	5/6	2780	22-Jun-16	-11	0.81	97.2%	Decreasing
CWP-120A	Arsenic	10	4/5	15	25-Apr-17	-2	0.21	62.5%	Stable
CWP-124*	Total Chromium	50	1/1	1080	19-Apr-20	Insufficient Sampling to Statistically Evaluate			
	Hexavalent Chromium	50	1/1	978	19-Apr-20				
CWP-125*	Total Chromium	50	1/1	5660	19-Apr-20				
	Hexavalent Chromium	50	1/1	5480	19-Apr-20				
Infiltration Trench Area Wells									
CWP-20	Arsenic	10	8/9	240	26-Apr-17	-12	1.32	87.0%	No Trend
HL-7 ⁵	Total Chromium	50	0/7	N/A	N/A	12	0.54	94.9%	Prob. Decreasing
	Hexavalent Chromium	50	0/4	N/A	N/A	6	0.56	95.8%	Increasing

Notes:

*Indicates newly installed well with too few data points for the Mann-Kendall statistical trend analysis.

¹Mann-Kendall Statistical analysis for contaminants evaluated from 2016 to 2020 unless otherwise noted.

²The Mann-Kendall Statistic (S) measures the trend of the data. Positive values indicate an increase of concentration over time, whereas negative values indicate a decrease in concentration over time.

³The Coefficient of Variation (COV) is a statistical measure of how the individual data points vary about the mean value. The coefficient of variation, defined as the standard deviation divided by the average. Values near 1 indicate that the data form a relatively close group about the mean value. Values larger or smaller than 1.0 indicate that the data show a greater degree of scatter about the mean.

⁴The Confidence in Trend is the statistical confidence that the constituent concentration is increasing (S-0).

⁵Mann-Kendall Statistical analysis for contaminants evaluated for 5 years of sampling (2016 to 2020) and 10 years of sampling (2010 to 2020) to observe the long-term trend -- no exceedances during this review period.

4.2.3. Surface Water

With the cessation of the wood preserving operations on June 8, 2018, the need to collect stormwater also ended, with the last collection occurring on June 1, 2018. This was approved by the State Water Board in communications dated June 1, 2017. In addition, Coast Wood Preserving reported that no stormwater sampling was conducted during the reporting period January through June 2016.

Coast Wood Preserving conducted stormwater sampling on February 8, February 21, and March 24, 2017 as well as January 8, January 24, and April 6, 2018 in accordance with the revised monitoring and reporting order R1 2012-0055. No detection of dissolved arsenic or chromium were recorded in any of the sample locations.

4.3. Site Inspection

A formal site inspection was not completed for this Five-Year Review due to travel restrictions resulting from the COVID-19 pandemic. Mr. Tom Lanphar, project manager from the Department of Toxic Substances Control, visited the Site several times to oversee work in the past five years. In November 2018, Mr. Lanphar oversaw the soil sampling to determine the extent of impacted soil beneath the former building recently demolished, and he visited the Site again in June 2019 to observe the excavation and removal of impacted soil. And finally, Mr. Lanphar visited the Site in February 2020 to oversee the monitoring wells installation. EPA did not visit the Site over the past five years.

5. Technical Assessment

5.1. *Question A: Is the remedy functioning as intended by the decision documents?*

Yes, the remedy is functioning as intended. Containment is effective as no site-related chemicals are migrating off-Site in the groundwater at concentrations exceeding remedial standards and there is no complete groundwater pathway on-Site. Contaminated soil left on-Site was removed in 2019 and DTSC determined the soil cleanup goals were met. The Land Use Covenant, placed on the Site in 1989, remains in place to ensure that the Site will not be used for residential occupancy. It further restricts earthwork and limits the construction of groundwater wells. The paving prevents the migration of contamination in soils into the groundwater (or released as dust) such that no exposure pathways exist.

With the cessation of wood preserving activities on June 8, 2018 (i.e., with the transfer of the ownership of Coast Wood Preserving), site inspection and maintenance activities ceased. The wood preserving machinery and supporting facilities were decommissioned or sold and removed from the Site.

5.2. Question B: Are the exposure assumptions, Toxicity Data, Cleanup Levels, and Remedial Action Objectives Used at the Time of Remedy Selection Still Valid?

Yes, the standards described in the 1989 ROD and 2003 ESD are still valid . While the Superior Court of California has invalidated the State standard for hexavalent chromium, the cleanup goal remains protective for groundwater. The State Water Board is in the process of reissuing a drinking water standard for hexavalent chromium and plans to publish a Notice of Proposed Rulemaking in 2021. EPA is following the development of this drinking water standard and will review all ARARs again at the next five-year review.

The final location of contaminated soil has been removed and the EPA certified the Site as ready for reuse and redevelopment on August 6, 2020. The DTSC acknowledged that the remediation effort satisfied the cleanup goals for soil remediation in a letter dated February 24, 2020. Institutional controls are in place that ensure land use is limited and on-Site groundwater cannot be used for drinking water or other uses that could interfere with Site remediation.

No new human health or ecological routes of exposure or receptors have been identified since the last Five-Year Review Appendix F). In addition, no new contaminants or contamination sources have been identified.

5.3. Question C: Has Any Other Information Come to Light That Could Call Into Question the Protectiveness of the Remedy?

Current assumptions regarding protectiveness of remediation and containment methods may not reflect changing climate impacts. Periodic evaluations of implemented remedies may not incorporate all climate change impacts, including changes in frequency and intensity that may impact remedy effectiveness. The Site is close to the Russian River which periodically floods, and this area of California is known to experience drought and wildfires.

Ukiah is a city for which CAL FIRE has made recommendations as a Very High Fire Hazard Severity Zone. The GAO-20-73 Report indicates that the Site is considered to be in an area potentially impacted by the highest flood hazard due to its location within a 0.2 mile radius from the Russian River at the report's mapping scale (it is closer to 0.38 miles west of the Russian River). Since the Site is no longer active and the ground surface is paved, these natural disaster events are unlikely to impact the protectiveness of the Site.

No other information has come to light that could call into question the protectiveness of the remedy at the Site.

6. Issues/Recommendations

Table 6: Issues and Recommendations Identified in the Five-Year Review

Issues and Recommendations Identified in the Five-Year Review:				
OU(s): Sitewide	Issue Category: Other			
	Issue: Due to COVID travel restrictions, EPA was not able to conduct a Site Inspection during the five-year review period.			
	Recommendation: EPA will conduct a Site Inspection once EPA's travel restrictions are lifted.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA	9/30/2022

6.1. Other Findings

The following are additional findings to improve the remedy at Coast Wood Preserving:

- Continue semi-annual sampling of well HL-7, instead of the annual monitoring scheduled to start in 2021, to more closely monitor concentration trends of total chromium and hexavalent chromium in the Infiltration Trench Area, allowing for quicker adjustment in remedial actions, should the chromium levels increase above the cleanup levels.
- Include arsenic and hexavalent chromium concentration maps for annual monitoring and a groundwater elevation summary table, if possible. Several groundwater monitoring reports within the review period did not include these figures, which are helpful for determining plume movement.
- Include Geometric Mean of Vertical Hydraulic Gradient (ft/ft) and Horizontal Groundwater Velocity (ft/year) in annual groundwater reports to monitor changes in groundwater flow direction and speed.
- If arsenic levels increase (or do not decrease) downgradient of well CWP-20 located in the Infiltration Trench Area, installation of an additional monitoring well should be considered to monitor the potential for off-site groundwater migration of arsenic with concentrations exceeding the cleanup goal.

The above findings do not affect current and/or future protectiveness.

7. Protectiveness Statement

Table 7. Protectiveness Statement

Sitewide Protectiveness Statement	
<i>Protectiveness Determination:</i>	Protective
<i>Protectiveness Statement:</i>	The remedy at the Coast Wood Preserving Site currently protects human health and the environment because the remedy is functioning as intended and no exposure pathways to contaminated media exists. An asphalt/concrete cap covers the entire Site, eliminating direct contact exposure to arsenic- and chromium-contaminated soils and prevents leaching of contaminants into groundwater. A Land Use Covenant, which was filed and recorded with the County of Mendocino in 1989, requires the maintenance of an asphalt and concrete cap over the Site and restricts the use of the property to non-residential purposes. In order to ensure that the site is protective in the long-term, EPA will conduct a site inspection when COVID travel restrictions are lifted.

8. Next Review

The next Five-Year Review report for the Coast Wood Preserving Site is required five years from the completion date of this review.

Appendix A: List of Documents Reviewed

- California Environmental Protection Agency. January 2005. Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties
- Consent Decree for Coast Wood Preserving, Inc. December 21, 2017
- Covenant and Agreement. September 25, 1989 by Coast Wood Preserving, Inc. and California Department of Health Services.
- EnviroAnalytics Group. August 2018. 2018 Semi-Annual Groundwater Monitoring Report Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. May 2019. Evaluation of Arsenic and Hexavalent Chromium in Concrete Addendum to Site Characterization Report Coast Wood Preserving
- EnviroAnalytics Group. September 2019. 2019 First Semi-Annual Groundwater Monitoring Report Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. January 2020. 2019 Annual Groundwater Monitoring Report Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. January 2020. Remedial Action Plan Implementation Completion Report Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. May 2020. Groundwater Delineation Investigation and In-Situ Remediation Work Plan Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. June 2020. 2020 First Semi-Annual Groundwater Monitoring Report Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. June 2020. Operation and Maintenance Plan Coast Wood Preserving Site Ukiah, California
- EnviroAnalytics Group. October 2020. Groundwater Delineation Results and Proposed Pilot Study for In-Situ Groundwater Remediation Coast Wood Preserving Site Ukiah, California
- EPA. September 2016. Fifth Five-Year Review Report for Coast Wood Preserving Superfund Site Mendocino County, California
- EPA. September 29, 1989. EPA Superfund Record of Decision: Coast Wood Preserving, EPA/ROD/R09-89/038 1989
- Stantec. 2017. 2016 Annual Groundwater Monitoring Report Coast Wood Preserving Site, Ukiah, California
- Stantec. 2017. 2017 Semi-Annual Groundwater Monitoring Report Coast Wood Preserving Site, Ukiah, California
- Stantec. 2018. 2017 Annual Groundwater Monitoring Report Coast Wood Preserving Site, Ukiah, California

Appendix B: Site Chronology

Event	Date
Coast Wood Preserving began wood preserving operations at the Site.	1971
California Department of Fish and Game notified RWQCB that chromated copper arsenate (CCA) wood preservation solution was being discharged into tributaries of the Russian River	February 1972
RWQCB issued Waste Discharge Requirements to Coast Wood Preserving prohibiting the discharge of wood treatment chemicals to groundwater or surface water.	April 1972
Coast Wood Preserving began berm construction, roof construction and installation of additional paving to minimize the formation of runoff contaminated with drippage from treated wood	1980
RWQCB issued Cease and Desist Order No. 81-61 requiring Coast Wood Preserving to eliminate the discharge and threat of discharge to surface water and to conduct groundwater investigation	March 1981
Coast Wood Preserving complied with the RWQCB order by controlling the runoff, increasing runoff storage capacity, and conducting groundwater investigation, and paving the Site.	1981
Site investigations identified impacts to soil and groundwater beneath the Site.	1981
Coast Wood Preserving installed a slurry wall to contain the chromium-impacted groundwater and began groundwater extraction	1983
EPA added the Site to the National Priorities List.	September 8, 1983
Remedial Investigation started	May 1, 1984
DTSC issued a Remedial Action Order requiring Coast Wood Preserving to remediate the site.	December 1988
DTSC approved the Remedial Action Plan for the Site. USEPA signed a Record of Decision for the Site (remedy selected).	September 29, 1989
Remedial Action started	January 15, 1990
RWQCB revised the Waste Discharge Requirements with Order No.94- 63 to reflect changes at the plant and to allow the re-injection of the treated groundwater to a deep well.	December 1994
DTSC completed the first five-year review for the Site	January 1996
Final Remedy Selected	June 3, 1999
DTSC approved and U. S. EPA concurred with the Proposed Amendment to the Remedial Action Plan for in situ reduction and fixation of hexavalent chromium using calcium polysulfide. Waste Discharge Requirements Order No. 99-45 was adopted by the RWQCB, authorizing the proposed in-situ reduction, and establishing new groundwater monitoring and sampling requirements.	July 1999
First Reductant Injection Program	September 1999
Second Reductant Injection Program	April 2000

Event	Date
DTSC approved the second five-year review report for the Site that was prepared by Coast Wood Preserving.	August 2001
Third Reductant Injection Program	June 2002
Fourth Reductant Injection Program	March 2003
DTSC prepared and EPA concurred with an ESD to revise the cleanup goals for hexavalent chromium and arsenic in soil. The ESD modified the timing and the scope of the soil remediation	August 2003
Coast Wood Preserving began to use an Alkaline Copper Quat solution (ACQ) to replace CCA in the wood treatment process at the Site. Disodium Octoborate Tetrahydrate (DOT) was added to the ACQ solution in 2005	January 2004
A total of approximately 2,965 tons of accessible impacted soil and surface cover material were removed south of the wood treatment facility and hauled to a permitted landfill for disposal.	February 2004
Waste Discharge Requirements Order No. R1-2004-0094 was adopted by the RWQCB. The Order allowed Coast Wood Preserving to change the wood treatment chemical solution from CCA solution to ACQ solution or a mixture of ACQ and DOT solution. It allows Coast Wood Preserving to use other reducing agents in addition to calcium polysulfide, such as ferrous or zero valent iron, to treat hexavalent chromium contamination in soil and groundwater	November 2004
Fifth Reductant Injection Program	March 2005
A total of approximately 2,734 tons of accessible impacted soil and surface cover material beneath and east of the northern storm water tank farm, beneath and west/southwest of the former 330,000-gallon water tank, and west of the Phase 2 and Phase 3 excavations were removed and transported to a permitted landfill for disposal	December 2005
Well CWP-19 sealed	1 st Quarter 2006
DTSC approved the third five-year review report for the Site which was prepared by DTSC with the assistance of MWH Global, Inc.	September 2006
A total of approximately 61 cubic yards of soil was excavated for the construction of the new mix tank farm area. A total of approximately 306 cubic yards was removed from beneath the former mix tank farm area and approximately 117 cubic yards was removed beneath the former utility trench east of the former mix tank farm area.	September 2006
Sixth Reductant Injection Program	September 2006
Wells CWP-2A and CWP-2B abandoned	October 2006
Seventh Reductant Injection Program	February 2009
Wells CWP-14, CWP-17, CWP-110, CWP-112 and CWP-117 and Lysimeters LY-2, LY-2A, LY-3 and LY-3 abandoned.	March 2008
Eighth Reductant Injection Program	March 2010
Off-site wells AT-1, AT-2, AT-3, AT-4, and AT-5 abandoned	September 2010

Event	Date
DTSC authorized discontinuing injections of calcium polysulfide reductant due to low levels of Cr ⁺⁶	February 12, 2012
Ten wells abandoned – 5 in December 2012 & 5 in October 2013	October 2013
Calcium polysulfide reductant infiltration upgradient of the extraction trench with DTSC approval (letter April 1, 2015) due to high levels of Cr ⁺⁶ in the extraction trench	Jan 2015 & Feb 2016
Fifth FYR review	September 15, 2016
Final Remedial Action Started	June 1, 2018
Coast Wood Preserving Operations Ended and Site Sold	June 8, 2018
Removal of contaminated soil from the former production area	August & November 2019
EPA Determined Construction Completed	August 6, 2020
EPA determines the Site is Ready for Reuse and Redevelopment	August 6, 2020

Appendix C: Data Review

The U.S. Army Corps of Engineers (USACE) reviewed Annual Groundwater Monitoring and Evaluation Reports, submitted on behalf of Coast Wood Preserving since the last Five-Year Review. Groundwater elevations, dissolved metal concentrations, trend analysis, and all reported verified exceedances were reviewed for this review period.

C.1 Groundwater

The site-specific geology consists of four hydrostratigraphic zones:

- Zone 1 comprises a predominantly clayey silt layer with permeable stringers and lenses of sand and gravel that is part of the fluvial outwash deposits of the Russian River. The lateral migration through this zone of fluvial deposits appears to be limited to the irregular, more permeable sand, and gravel lenses, while vertical migration through this clayey silt layer is believed to be very slow. Zone 1 extends down to approximately 20 feet below ground surface (ft bgs).
- Zone 2 comprises a sand and gravel layer that has been referred to as the “deep zone”. This layer is approximately 10 ft thick and is the zone of most significant permeability and water production of the four zones.
- Zone 3 comprises a stiff clay approximately 5 ft thick, which acts as a barrier to Zone 4 and contributes significantly to reducing the potential vertical migration of hexavalent chromium.
- Zone 4 is a cemented silty sand and clayey sand / gravel layer. The vertical extent of this zone is not known.

To date, the groundwater monitoring and reporting program has included performing water level measurements, well purging, and the collection of groundwater samples for chemical analysis of dissolved chromium, arsenic, and other parameters related to the remedial actions for the Site. The current groundwater monitoring and reporting program is based primarily on the monitoring and reporting program adopted in 2012. The Regional Water Quality Control Board (dated April 5, 2019) approved removal of ammonia, calcium, and laboratory pH measurement (i.e., substituting field measured pH for laboratory measured pH) from the sampling program.

In February 2020, three groundwater monitoring wells CWP-123, CWP-124, and CWP-125 (Figure C-1) were installed at the Site in order to monitor concentrations of hexavalent chromium and arsenic within and downgradient of the former production area and the area of the final soil remediation activity. Well CWP-123 was paired with existing well CWP-122 which monitors groundwater conditions in Zone 1, while CWP-123 monitors groundwater conditions in Zone 2. Wells CWP-124 and CWP-125 are paired together beneath the canopied area near the former retorts and monitor groundwater conditions in Zone 1 and Zone 3, respectively. The newly installed wells have been included in the updated groundwater monitoring program. The current groundwater monitoring and reporting program consists of 19 sampled wells. Beginning in 2021 the groundwater monitoring and reporting program will move to annual sampling during the 2nd quarter.

Groundwater monitoring well locations can be viewed in Figure C-1. The wells at the Site are divided into one of three categories by area: the Dry Drip Area, the Infiltration Trench Area, and the Perimeter Wells Area.

C.1.1 Site Hydrology

Groundwater elevations on-site fluctuate seasonally, however, upon review of groundwater monitoring data in the wells at the Site, no significant elevation changes were noted from one year to the next, indicating the Site has not been significantly impacted by the most recent drought, nor is it impacted by human use in the area, despite the fluctuation in groundwater elevations. The greatest groundwater elevation gradient in 2020 was approximately 0.017 feet per foot, resulting in groundwater flow in the southeast direction (Figure C-2). The flow direction and gradient are consistent with previous monitoring events.

C.1.2 Groundwater Site Contaminant

Groundwater site contaminants requiring remediation under the ROD Amendment included total chromium, hexavalent chromium, and arsenic. Figure C-3 shows the extent of dissolved metals in groundwater as of April 2020.

Total Chromium in Groundwater

Of all the monitoring wells sampled for total chromium during the last five-year period only five wells had concentrations above their cleanup standard (50 µg/L). Each of these wells are located within or immediately adjacent to the former Dry Drip Area. In April 2020, the concentration in CWP-6 was 63.7 µg/L, which falls within the range of values seen in this well in the past three years. Total chromium concentrations in CWP-116 decreased to 15.5 µg/L in April 2020, which is below the concentrations generally observed over the last five years. The concentration in CWP-118A (567 µg/L) was generally within the inconsistent results observed in this well since 2016. Newly installed wells CWP-124 and CWP-125 exceeded the cleanup goal for dissolved total chromium (5,660 and 1,080 µg/L, respectively). These wells were installed below the canopied area and near the former retorts and sumps where contaminant impacts were anticipated to be at their highest. It is important to note that while some wells showed total chromium concentrations up to two orders of magnitude above the cleanup goal, the concentration of total chromium decreases with depth indicating a decrease of contamination which could migrate to lower aquifers.

HL-7 showed increasing concentrations during the past five year, though no exceedances. This is discussed in greater detail in section C.1.3.

Hexavalent Chromium in Groundwater

Of all the monitoring wells sampled for hexavalent chromium during the last five-year period only three wells in the former Dry Drip Area had concentrations above their cleanup standard (50 µg/L). CWP-118A had a hexavalent chromium concentration of 21.3 µg/L, which is consistent with the decreasing

concentrations observed in this well since 2016. The newly installed wells CWP-124 and CWP-125 each exceeded the hexavalent chromium cleanup goal with concentrations of 5,480 and 978 µg/L, respectively. These wells were installed below the canopied area and near the former retorts and sumps where contaminant impacts were anticipated to be at their highest. It is important to note that while these well showed hexavalent chromium concentrations up to two orders of magnitude above the cleanup goal, the concentration of hexavalent chromium decreased with depth indicating a decrease of contamination which could migrate to lower aquifers. The wells sampled for hexavalent chromium in April 2020 had similar concentrations for total chromium as well. HL-7 showed increasing concentrations during the past five year, though no exceedances. This is discussed in greater detail in section C.1.3.

Arsenic in Groundwater

Of all the monitoring wells sampled for arsenic during the last five-year period only three wells had concentrations above their cleanup standard (10 µg/L). In April 2020, CWP-20, located downgradient of the former Dry Drip Area and near the slurry wall, showed a concentration of 24.7 µg/L, which is generally consistent with measurements in this well since 2017. Wells CWP-8S and CWP-8D, located downgradient of CWP-20 and on the other side of the slurry wall, show concentrations of arsenic well below the cleanup goal (Figure C-1). CWP-116 showed a concentration of 5.8 µg/L, which falls within the range of values seen in this well in the past three years. CWP-120A was dry during the most recent sampling event but the sample from April 2019 showed a concentration of 10 µg/L, which falls within the range of values seen in this well in the review period

C.1.3 Groundwater Quality Data

Water quality data was reviewed from the EnviroAnalytics Group Semi-Annual (First Half 2020) Groundwater Monitoring Report. These semi-annual groundwater monitoring reports present a comprehensive review of groundwater concentrations and trend analysis. Following a review of the data presented in the Semi-Annual Groundwater Monitoring Report, USACE conducted Mann-Kendall statistical trend analysis for select wells that were cited in the report as having or have had site contaminants above cleanup levels within the review period. Table C-1 lists the selected wells for the Mann-Kendall statistical trend analysis and the summary of the results of the analysis. Figures C-4 through C-6 provide detailed results of the analysis.

Mann-Kendall Analysis for Groundwater

The Mann-Kendall test is a non-parametric test for identifying trends in time-series data. The test compares the relative magnitudes of sample data rather than the data values themselves. One benefit of this test is that the data does not need to conform to any one distribution type. Data reported as non-detects can be included by assigning them a common value that is smaller than the lowest detected value in the dataset, although the number of non-detects should not be greater than 50 percent of the sample size (n). For the purposes of this evaluation, laboratory samples for which contaminants were not detected above the reporting limit were labeled as non-detectable and are highlighted in red.

Wells that have been sampled less than four times were not statistically evaluated due to either insufficient sampling results above the detection limits or because all detected concentrations were below the cleanup goal.

A review of the data indicates that although total chromium was detected above its standard of 50 µg/L in five wells, none show increasing trends during the review period. Only three wells (CWP-6, CWP-116, and CWP-118A) showed total chromium concentrations above the cleanup goal with enough detections to statistically evaluate. The remaining wells sampled for total chromium showed concentrations either below the cleanup goal with no significant trends in concentration levels observed.

Hexavalent chromium was detected above its standard of 50 µg/L in three wells, none show increasing trends during the review period. Only one well (CWP-118A) showed hexavalent chromium concentrations above the cleanup goal with enough detections to statistically evaluate. The remaining wells sampled for hexavalent chromium showed concentrations either below the cleanup goal with no significant trends in concentration levels observed.

Similarly, arsenic was detected above its standard of 10 µg/L in three wells, none show increasing trends during the review period. Only three wells (CWP-116, CWP-120A, and CWP-20) showed arsenic concentrations above the cleanup goal with enough detections to statistically evaluate. The remaining wells sampled for arsenic showed concentrations either below the cleanup goal with no significant trends in concentration levels observed.

The concentration trends of wells mentioned above are predominantly decreasing, stable, or had no trend during the review period. The groundwater in wells CWP-6, CWP-116, CWP-118A, CWP-120A, and CWP-20 has had either stable concentrations or no trends consistently above cleanup levels during this Five-Year Review period, as shown in Table C-2. Wells CWP-6, CWP-116, CWP-118A, CWP-120A, CWP-124, and CWP-125 are in the Dry Drip Area where contaminants of concern migrated from the surface soils to the groundwater via vertical migration. Well CWP-20 is in the Infiltration Trench Area. All wells in the Perimeter Wells Area have had analysis indicating that concentrations of Site contaminants are below standards.

HL-7, located in the Infiltration Trench Area directly upgradient of the slurry wall (Figure C-1), has exceeded the total chromium and hexavalent chromium cleanup level in past sampling events (last exceedance for both was April 28, 2015) and shows a probably increasing for total chromium and increasing trend for hexavalent chromium, over the last five years. Therefore, the well was analyzed using Mann-Kendall Statistics to compare the trend between the last 5 and 10 years (Figure C-7). HL-7 does not show an increasing trend in total chromium and hexavalent chromium concentrations over the last 10 years.+ It is important to note that these measurements were only observed in one of the current sampling wells in the Infiltration Trench Area and are not valid for drawing conclusions over the entire Site.

Looking at the 10 year data, the graph in Figure C-7 indicates a pulse of untreated total chromium and hexavalent chromium resulting from seasonally high groundwater contacting contaminated soils in the vadose zone and prompting the recommendation in the February 2014 annual groundwater monitoring report for an additional round of reductant infiltration. As was the case for prior infiltration activities, the

purpose of the January 2015 infiltration event was to deliver a dilute solution of calcium polysulfide reductant into both the vadose and saturated zones into the trenches upgradient of HL-7, with groundwater extraction from HL-7 and re-infiltration of the extracted groundwater into the upgradient trenches. Immediate results after the infiltration and recirculation of the reductant indicated that dissolved chromium and arsenic were below levels of detection. In February 2016, additional infiltration of reductant occurred, while water levels remain elevated from winter rainfall.

Considering the trend observed at HL-7 during this review period, it is recommended that well HL-7 continue to be monitored for total chromium and hexavalent chromium on a semi-annual basis, instead of the annual (2nd quarter of the year) monitoring scheduled to start in 2021, to more closely monitor concentration trends in the Infiltration Trench Area and allow for adjustment in remedial actions, should the chromium levels increase above the cleanup levels.

Based on a review of groundwater contour maps from the Semi-Annual Groundwater Monitoring Report, there is insufficient data to generate plume maps for total chromium, hexavalent chromium, and arsenic during the period of this review (2016 through 2020). This is due to both several monitoring wells remaining dry since 2015, meaning sampling of these wells is no longer possible, and shrinking of the plumes at the Site, i.e. decreasing of the concentration of contaminants. Figure C-3 shows concentrations for these three contaminants as of April 2020. As noted in the previous Five-Year Review, the dry wells had declining concentrations or concentrations below standards prior to going dry.

Currently, the groundwater at the Site is not being used for any purpose, and the arsenic and total chromium contamination at concentrations exceeding standards is not migrating off-Site, as indicated by data from wells at the boundaries of the Site. The 19 sampled wells that comprise the current groundwater monitoring plan are sufficient in number and appropriately placed to monitor the concentrations and mobility of contaminants at the Site. Beyond the trench, concentrations of total chromium are below cleanup levels in wells sampled. Concentration of contaminants are expected to decline over time as arsenic reprecipitates and total chromium and hexavalent chromium concentrations reduce (from past injection and current infiltration activities). Contamination of groundwater is above cleanup levels on-Site, most notably in or around the Dry Drip Area; and there is no exposure pathway.

Table C-1: Mann-Kendall Trend Analysis for Site Contaminants

Well	Contaminant	Cleanup Level (µg/L)	Number of Exceedances/ Sampling Events ¹	Maximum Concentration (µg/L)	Date of Highest Concentration	Mann-Kendall Statistics (S) ²	Coefficient of Variation (COV) ³	Confidence in Trend ⁴	Concentration Trend
Dry Drip Area Wells									
CWP-6	Total Chromium	50	5/7	170	27-Mar-18	3	0.70	61.4%	No Trend
CWP-116	Arsenic	10	1/9	19	11-Nov-19	8	0.78	76.2%	No Trend
	Total Chromium	50	5/9	230	11-Nov-19	9	0.79	79.2%	No Trend
CWP-118A	Total Chromium	50	10/10	2700	22-Jun-16	-17	0.69	92.2%	Prob. Decreasing
	Hexavalent Chromium	50	5/6	2780	22-Jun-16	-11	0.81	97.2%	Decreasing
CWP-120A	Arsenic	10	4/5	15	25-Apr-17	-2	0.21	62.5%	Stable
CWP-124*	Total Chromium	50	1/1	1080	19-Apr-20	Insufficient Sampling to Statistically Evaluate			
	Hexavalent Chromium	50	1/1	978	19-Apr-20				
CWP-125*	Total Chromium	50	1/1	5660	19-Apr-20				
	Hexavalent Chromium	50	1/1	5480	19-Apr-20				
Infiltration Trench Area Wells									
CWP-20	Arsenic	10	8/9	240	26-Apr-17	-12	1.32	87.0%	No Trend
HL-7 ⁵	Total Chromium	50	0/7	N/A	N/A	12	0.54	94.9%	Prob. Decreasing
	Hexavalent Chromium	50	0/4	N/A	N/A	6	0.56	95.8%	Increasing

Notes:

*Indicates newly installed well with too few data points for the Mann-Kendall statistical trend analysis.

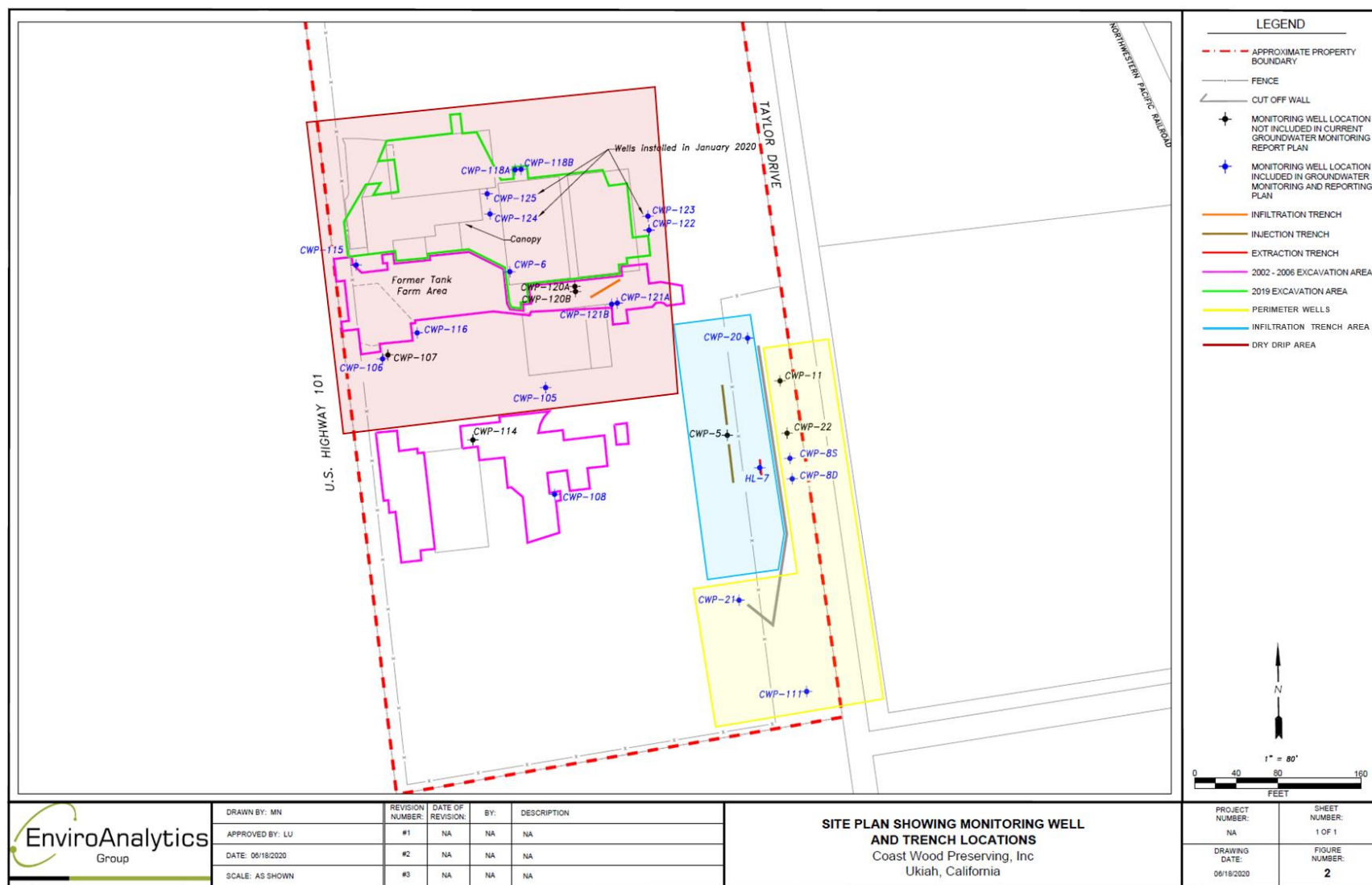
¹Mann-Kendall Statistical analysis for contaminants evaluated from 2016 to 2020 unless otherwise noted.

²The Mann-Kendall Statistic (S) measures the trend of the data. Positive values indicate an increase of concentration over time, whereas negative values indicate a decrease in concentration over time.

³The Coefficient of Variation (COV) is a statistical measure of how the individual data points vary about the mean value. The coefficient of variation, defined as the standard deviation divided by the average. Values near 1 indicate that the data form a relatively close group about the mean value. Values larger or smaller than 1.0 indicate that the data show a greater degree of scatter about the mean.

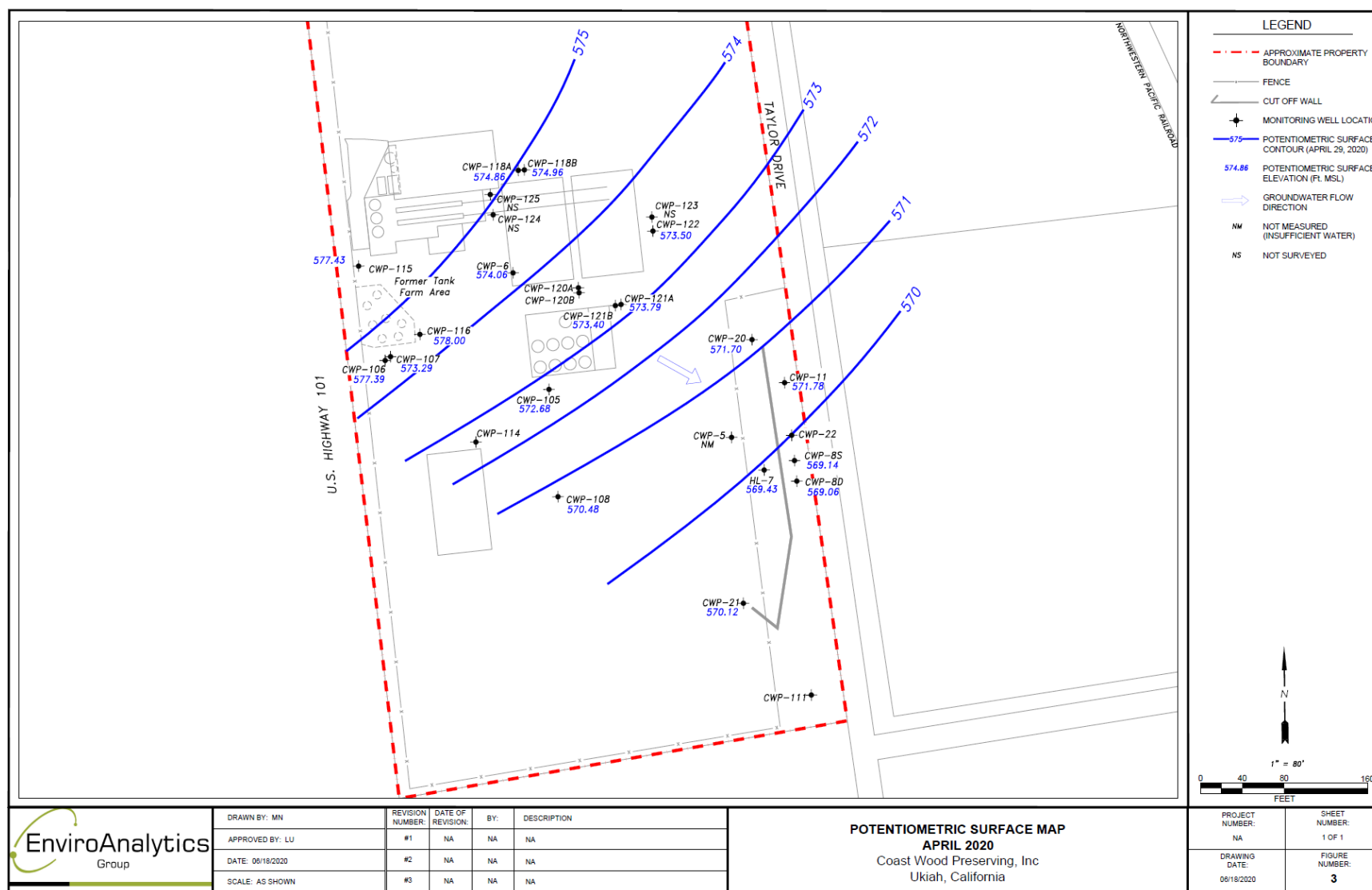
⁴The Confidence in Trend is the statistical confidence that the constituent concentration is increasing (S-0).

⁵Mann-Kendall Statistical analysis for contaminants evaluated for 5 years of sampling (2016 to 2020) and 10 years of sampling (2010 to 2020) to observe the long-term trend -- no exceedances during this review period.



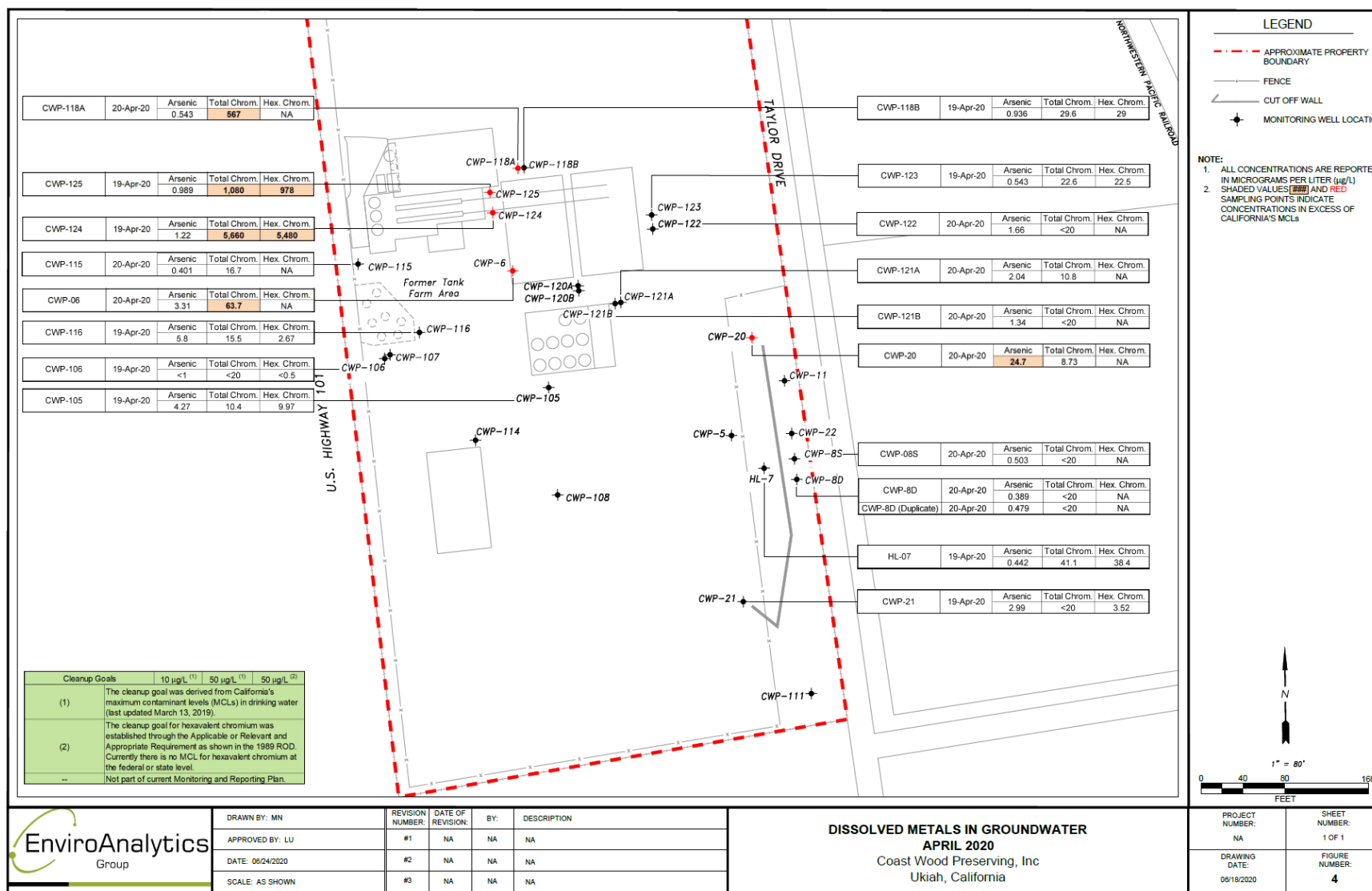
Source: EnviroAnalytics Group June 2020 First Semi-Annual Groundwater Monitoring Report (modified).

Figure C-1: Well location map.



Source: EnviroAnalytics Group June 2020 First Semi-Annual Groundwater Monitoring Report.

Figure C-2: Groundwater elevation contour map (April 2020).

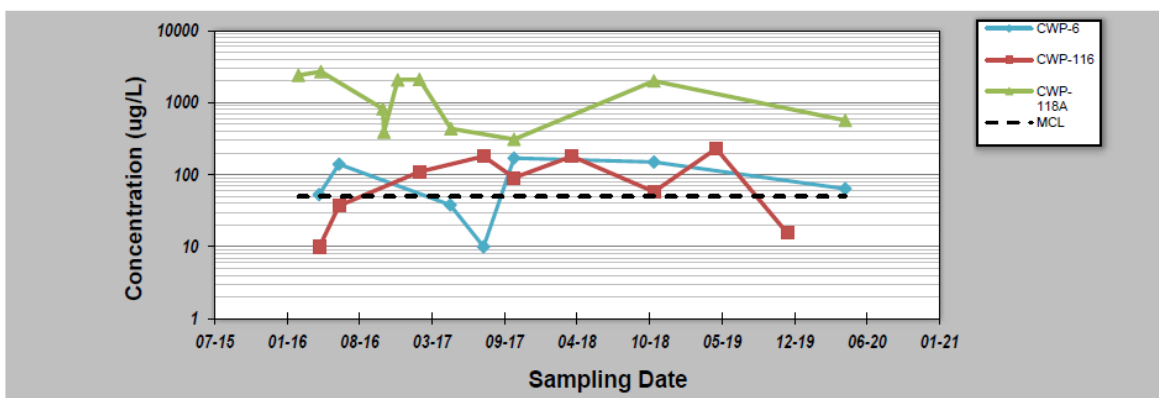


Source: EnviroAnalytics Group June 2020 First Semi-Annual Groundwater Monitoring Report.

Figure C-3: Contour map of dissolved metals in groundwater (April 2020).

GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date:	26-Feb-21	Job ID:	Coast Wood Preserving 2021 FYR				
Facility Name:	Coast Wood Preserving	Constituent:	Total Chromium				
Conducted By:	Travis Kelsay	Concentration Units:	ug/L				
Sampling Point ID:	CWP-6	CWP-116	CWP-118A				
Sampling Event	Sampling Date	TOTAL CHROMIUM CONCENTRATION (ug/L)					
1	3-2-2016			2400			
2	4-28-2016	53					
3	4-29-2016		10				
4	5-3-2016			2700			
5	6-22-2016	140	37				
6	10-21-2016			820			
7	10-24-2016			390			
8	12-1-2016			2070			
9	1-30-2017		110	2100			
10	4-25-2017	38					
11	4-27-2017			435			
12	7-26-2017	10	180				
13	10-18-2017	170	91	310			
14	3-27-2018		180				
15	11-8-2018	150	58	2000			
16	4-29-2019		230				
17	11-11-2019		15.5				
18	4-19-2020	63.7		567			
19	4-20-2020						
20							
Coefficient of Variation:	0.70	0.79	0.69				
Mann-Kendall Statistic (S):	3	9	-17				
Confidence Factor:	61.4%	79.2%	92.2%				
Concentration Trend:	No Trend	No Trend	Prob. Decreasing				



Notes:

- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
- Confidence in Trend = Confidence (in percent) that constituent concentration is increasing ($S > 0$) or decreasing ($S < 0$): $> 95\%$ = Increasing or Decreasing; $\geq 90\%$ = Probably Increasing or Probably Decreasing; $< 90\%$ and $S > 0$ = No Trend; $< 90\%$, $S \leq 0$, and $COV \geq 1$ = No Trend; $< 90\%$ and $COV < 1$ = Stable.
- Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.
- Values in red = Not detected above the reporting limit

DISCLAIMER: The GSI Mann-Kendall Toolkit is available "as is". Considerable care has been exercised in preparing this software product; however, no party, including without limitation GSI Environmental Inc., makes any representation or warranty regarding the accuracy, correctness, or completeness of the information contained herein, and no such party shall be liable for any direct, indirect, consequential, incidental or other damages resulting from the use of this product or the information contained herein. Information in this publication is subject to change without notice. GSI Environmental Inc., disclaims any responsibility or obligation to update the information contained herein.

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Figure C-4: Mann-Kendall Statistics for Total Chromium concentration.

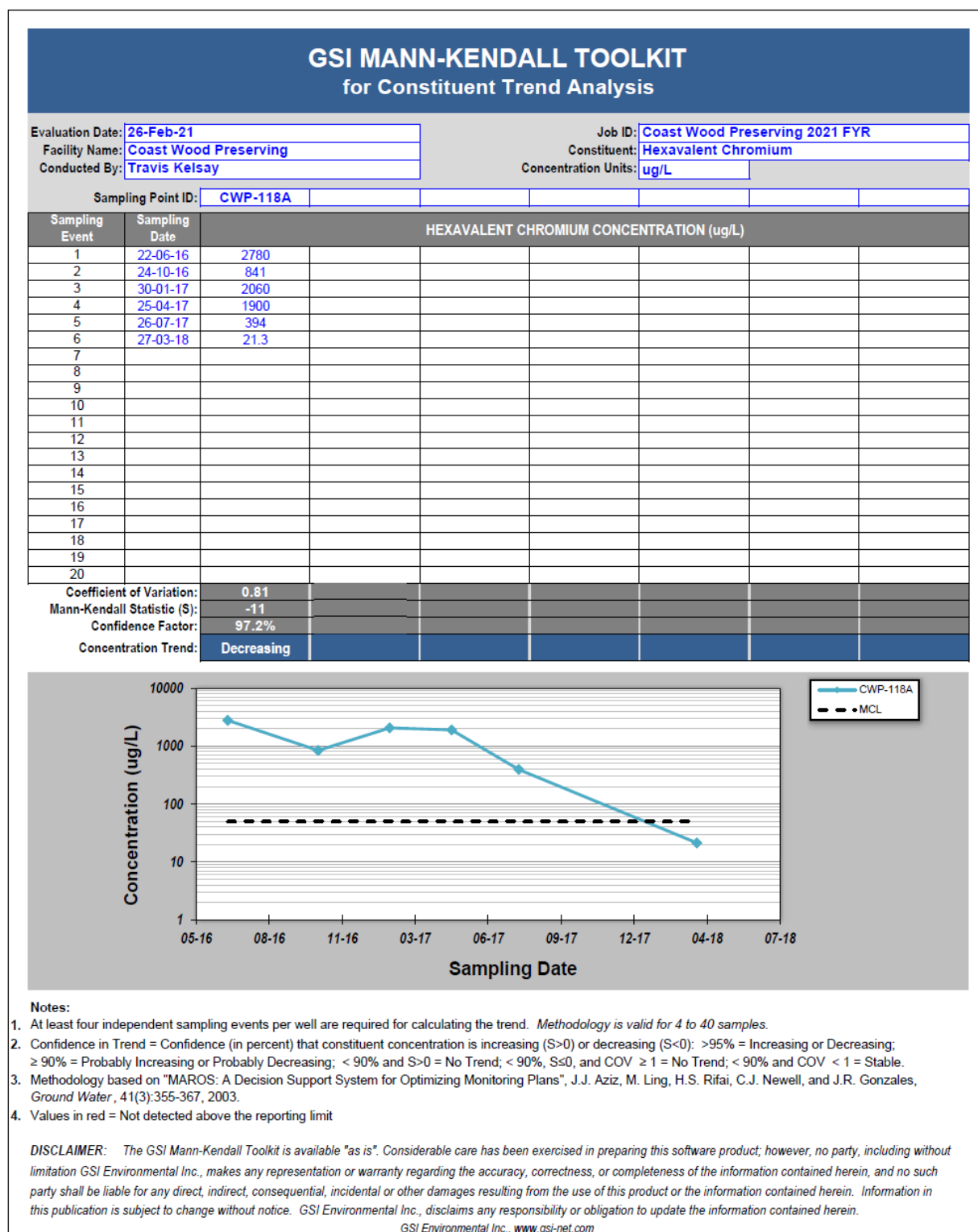
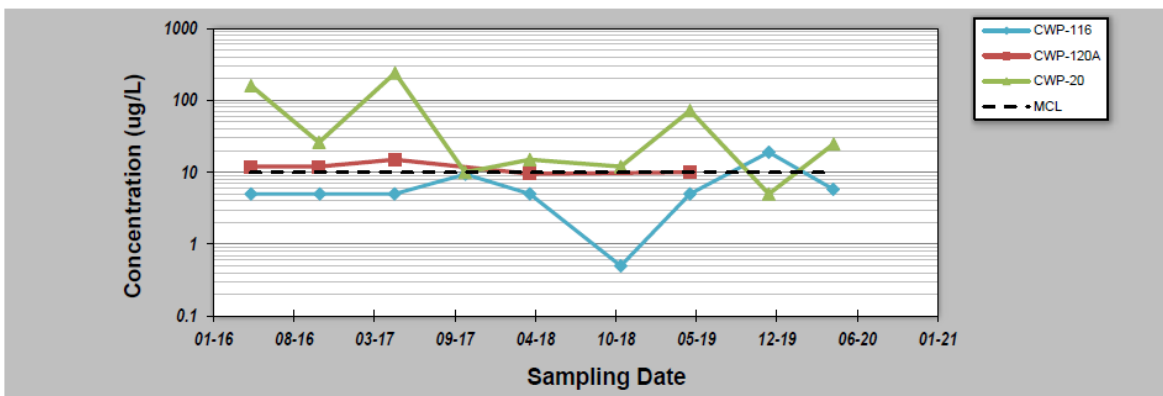


Figure C-5: Mann-Kendall Statistics for Hexavalent Chromium concentration.

GSI MANN-KENDALL TOOLKIT for Constituent Trend Analysis

Evaluation Date:	26-Feb-21	Job ID:	Coast Wood Preserving 2021 FYR					
Facility Name:	Coast Wood Preserving	Constituent:	Arsenic					
Conducted By:	Travis Kelsay	Concentration Units:	ug/L					
Sampling Point ID:	CWP-116	CWP-120A	CWP-20					
Sampling Event	Sampling Date	ARSENIC CONCENTRATION (ug/L)						
1	03-05-16	5	12	160				
2	19-10-16		12	26				
3	21-10-16	5						
4	25-04-17	5	15					
5	26-04-17			240				
6	17-10-17			10				
7	18-10-17	9.4						
8	27-03-18	5	9.5	15				
9	08-11-18	0.5		12				
10	29-04-19	5	10	72				
11	11-11-19	19		5				
12	19-04-20	5.8						
13	20-04-20			24.7				
14								
15								
16								
17								
18								
19								
20								
Coefficient of Variation:	0.78	0.21	1.32					
Mann-Kendall Statistic (S):	8	-2	-12					
Confidence Factor:	76.2%	62.5%	87.0%					
Concentration Trend:	No Trend	Stable	No Trend					



Notes:

- At least four independent sampling events per well are required for calculating the trend. *Methodology is valid for 4 to 40 samples.*
- Confidence in Trend = Confidence (in percent) that constituent concentration is increasing ($S > 0$) or decreasing ($S < 0$): $> 95\%$ = Increasing or Decreasing; $\geq 90\%$ = Probably Increasing or Probably Decreasing; $< 90\%$ and $S > 0$ = No Trend; $< 90\%$, $S \leq 0$, and $COV \geq 1$ = No Trend; $< 90\%$ and $COV < 1$ = Stable.
- Methodology based on "MAROS: A Decision Support System for Optimizing Monitoring Plans", J.J. Aziz, M. Ling, H.S. Rifai, C.J. Newell, and J.R. Gonzales, *Ground Water*, 41(3):355-367, 2003.
- Values in red = Not detected above the reporting limit

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Figure C-6: Mann-Kendall Statistics for Arsenic concentration.

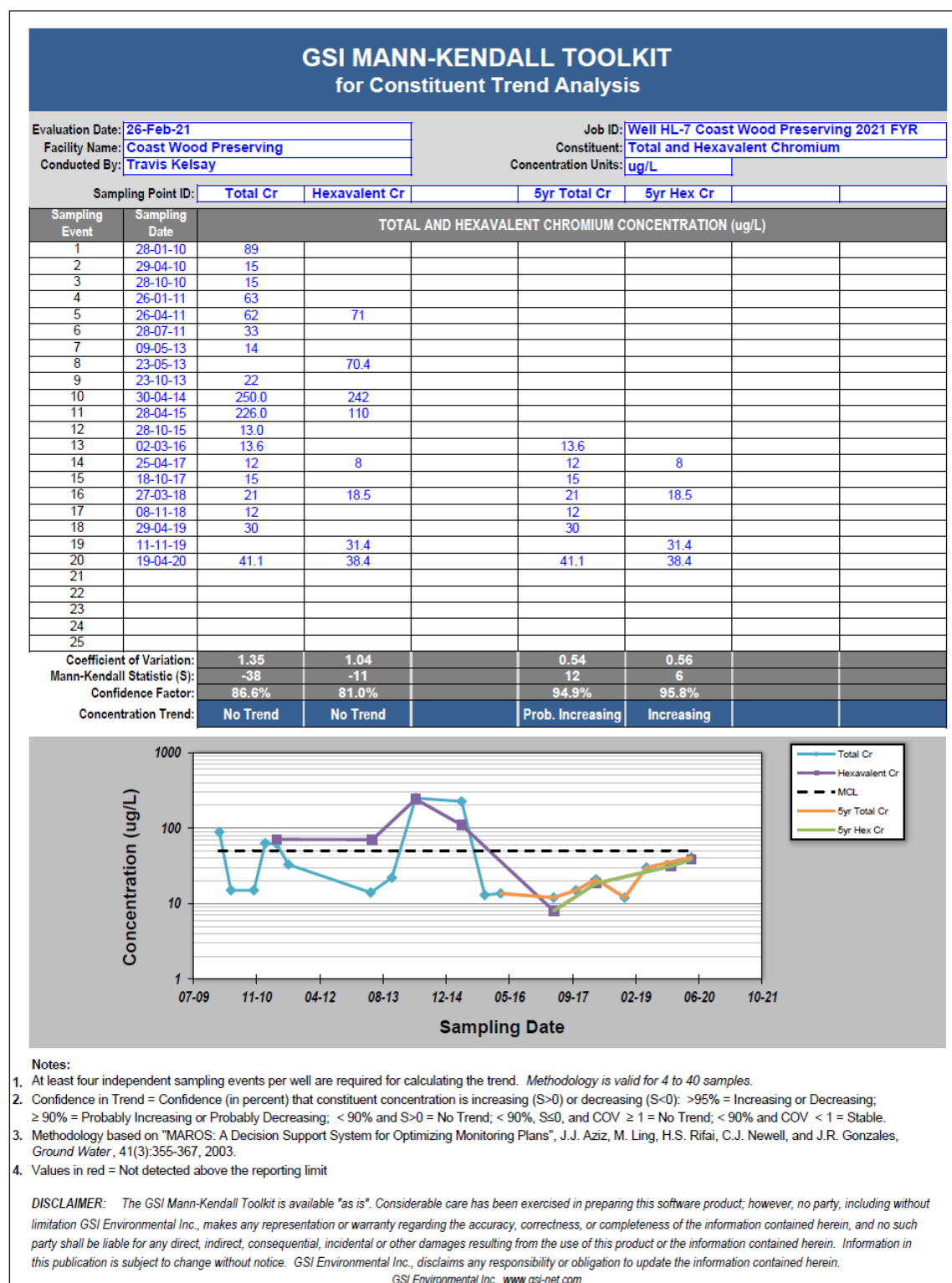


Figure C-7: Mann-Kendall Statistics for well HL-7 Chromium concentrations.

C.1.4 Soils

A concrete surface covers an area that is approximately 140 ft (east-west) by 35 ft (north south). Asphalt surface flanked the concrete pad on all sides with a berm of asphalt formed along the perimeter of the canopy area to prevent the potential for release outside the canopy area. The concrete area beneath the canopy supports two narrow gauge rail lines that allowed carts on rail wheels to be stacked with lumber that in turn was wheeled into two separate retorts for pressure treating. Upon completion of the pressure treatment, the carts of wood were transported along the rails and allowed to drip onto the concrete drip pad. The drip pad sloped toward the center between the two rail lines where the residual fluid was collected. A soil characterization investigation conducted by EAG in November 2018 concluded that, in general, the soil impacts were found to be contained in the imported gravelly fill material located immediately below the paved surface of the drip-cap and canopied area. In some localized areas, impacts extended outside the canopy and into the native yellow clayey and sandy silt beneath the gravelly fill.

Upon breaking up the concrete during the 2019 soil excavation, much of the area showed a ‘halo’ of light yellow-green coloration, sometimes with a bright green mix of color. The ‘halo’ of light yellow-green color appears to be the remnant of exposure to the chromated copper arsenate, whereas the dark green signifies exposure to the copper-sulfate compound that replaced the chromated copper arsenate. The initial concrete characterization activities were conducted in March 2019. Relatively random samples of concrete were analyzed to identify whether there were impacts of arsenic and/or hexavalent chromium that exceeded the site-specific soil cleanup criteria. The concrete samples were broken up into approximately 2-inch by 2-inch by 1-inch pieces that were then ground up to a powder in the lab. Of the 10 concrete samples, three showed arsenic and/or hexavalent chromium concentrations above the cleanup level (27 mg/kg for arsenic and 42 mg/kg for hexavalent chromium).

Overburden fill was removed, and stockpiled coarse-grained material was screened whereby approximately 25-35 percent of the overall mass was sequestered for reuse as backfill into the excavation area and the remaining fine portion of the screened fill was transported for disposal at the appropriate Waste Management Facility in Kettleman City, California. Prior to placing the clean imported backfill, the excavation area and all of the coarse-grained material sequestered for fill material were treated by spraying an aqueous solution of calcium polysulfide over the floor and sidewall areas of the excavation, including the piers of the canopy structure and walls and floors of the pits (i.e., areas of deeper excavation). This solution has been shown to reduce hexavalent chromium to trivalent chromium on contact thus effectively treating potential residual impacts of hexavalent chromium.

Once the overburden fill material and all visibly stained soil was removed, the yellow native silt was exposed. The native silt underlying the gravelly fill was sampled in an approximate 20 ft by 20 ft grid to determine if impacts remained and needed further excavation. Similarly, sidewall samples of fill material along the extents of excavation and edge of the grid cells were composited to identify where the sidewall extents needed additional scraping for removal from the site. It was observed that less than 5% of the overburden fill samples from the 2018 and 2019 site assessments contained hexavalent chromium above the cleanup objective even when arsenic was at concentrations above the respective cleanup objective.

Confirmation soil samples were collected at 110 locations, which represent soil conditions at the extents of the excavation. All but four of the 110 confirmation soil samples (2 from floor locations and 2 from sidewall locations) met the cleanup objective at the Site for arsenic. Each of these locations is within two times the site-specific cleanup objective for arsenic. An analysis of the 110 confirmation samples resulted in a value of 9.41 mg/kg for arsenic in soil, approximately one-third of the cleanup objective of 27 mg/kg. All but three of the 110 confirmation soil samples (2 from interior floor locations and 1 slightly in exceedance from a sidewall location) met the cleanup objective at the Site for hexavalent chromium. Each of these locations are within three times the site-specific cleanup objective for hexavalent chromium. An analysis of the 110 confirmation samples resulted in a value of 18.95 mg/kg for hexavalent chromium in soil, less than half of the cleanup objective of 42 mg/kg.

The 2019 remedial excavation was backfilled with clean, sequestered cobbles and concrete chunks, and lastly finished with clean imported soil. The imported soil consisted of the same geological material that is referred to as ‘native soil’, described as yellow clayey and sandy silt. The fill was placed into the excavation to within approximately 4-to-6 inches of the perimeter asphalt surface that surrounded the excavation. This gap at the surface was left to allow for flexibility of a future owner to determine the exact surface cover.

Appendix D: ARAR Assessment

Section 121(d)(2)(A) of Comprehensive Environmental Response, Compensation, and Liability Act specifies that Superfund remedial actions must meet any Federal standards, requirements, criteria, or limitations that are determined to be legally applicable or relevant and appropriate requirements (ARARs). ARARs are those standards, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a Comprehensive Environmental Response, Compensation, and Liability Act site.

Changes (if any) in ARARs are evaluated to determine if the changes affect the protectiveness of the remedy. Each ARAR and any change to the applicable standard or criterion are discussed below.

Chemical-specific ARARs identified in the ROD for groundwater were evaluated in Table D-1. The hexavalent chromium drinking water standard of 0.01 mg/L (established July 1, 2014) is no longer in effect as of September 11, 2017, by court order. The previous drinking water standard of 0.05 mg/L for total chromium remains in place while the State Water Resources Control Board develops a new drinking water standard for hexavalent chromium. Cleanup levels for soils are toxicity-based, not ARAR-based, and are evaluated in the Toxicity Analysis (Appendix F).

Table D-1. Summary of Groundwater ARAR Changes

Chemical	2003 ESD Cleanup Levels (µg/L)	Basis for Cleanup Level	Current Regulations (µg/L)		ARARs More or Less Stringent than Cleanup Levels?
			State ²	Federal ¹	
Arsenic	10	State drinking water standard	10	10	No changes
Hexavalent Chromium	50	State drinking water standard	-- ³	100	Less stringent
Total Chromium	50	State drinking water standard	50	100	No changes

1. U.S. Drinking Water Standards

2. Title 22, Division 4, Chapter 15, Article 4 Section 64431 Maximum Contaminant Levels – Inorganic Chemicals

3. Hexavalent chromium groundwater drinking water standard was removed in 2017 in accordance with the Superior Court of Sacramento County and reverted to the total chromium drinking water standard

Federal and State laws and regulations other than the chemical-specific ARARs discussed in Table D-1 that have been promulgated or changed since the 2011 ROD Amendment are described in Table D-2. There have been no revisions to laws or regulations that affect the protectiveness of the remedy.

The following action- or location-specific ARARs identified in the Remedial Action Plan have not changed (in the past five years) and do not affect protectiveness:

- Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986. Subchapter 1 Section 9602 and 9621.

- Resource Conservation and Recovery Act of 1976, amended by the Hazardous and Solid Waste amendments of 1984. 42 U.S.C. Chapter 82
- Safe Drinking Water Act of 1974 as amended 42 U.S.C. § 300f
- California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) Title 27, Division 4, Chapter 1

Table D-2 includes the remaining ARARs from the Remedial Action Plan that have had revised requirements during this review period.

Table D-2. Summary of ARAR Changes for Site in the Past Five Years

Requirement and Citation	Document	Description	Effect on Protectiveness	Comments	Recent Amendment Date
Porter-Cologne Water Quality Act (Title 23 Divisions 3-5) Water Code, §§ 13558-13558.1	1989 Remedial Action Plan	State drinking water standards are ARARs for the site and were used to establish groundwater cleanup levels.	Changes do not affect protectiveness.	Changes apply to onsite treatment and reuse of non-potable water in buildings.	January 1, 2019
California Code of Regulations, Title 22, Division 4, Chapters 3 and 17	1989 Remedial Action Plan	The Department of Health Services incorporates by reference the objectives, criteria, procedures, and guidelines for the implementation of the California Environmental Quality Act	Changes do not affect protectiveness.	Changes apply to surface water augmentation using recycled water (SBDDW-16-02).	October 1, 2018
North Coastal Basin Water Quality Control Plan, Resolution No. R1-2019-0038	1989 Remedial Action Plan	The Basin Plan is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater.	Changes do not affect protectiveness.	Changes, titled Incorporate an Action Plan for the Russian River Watershed Pathogen Total Maximum Daily Load and a Discharge Prohibition, apply to pathogens from human and animal waste	August 14, 2019

Requirement and Citation	Document	Description	Effect on Protectiveness	Comments	Recent Amendment Date
California Health and Safety Code Division 37, Section 25356.1.5. Toxicity Criteria Rule is at Title 22 California Code of Regulations 68400.5, 69020-69022	1989 Remedial Action Plan	The State of California Office of Administrative Law approved the Toxicity Criteria for Human Health Risk Assessments, Screening Levels, and Remediation Goals Rule.	Changes do not affect protectiveness.	The Rule requires human health risk assessments, risk-based screening levels, and remediation goals be based on a specified hierarchy of toxicity criteria. It applies to health risk assessments, human health risk-based screening levels, and human health risk-based remediation goals approved after the effective date of the Rule.	September 4, 2018

Appendix E. Toxicity Assessment

A human health risk assessment was completed for the Coast Wood Preserving Site as part of the 1989 ROD. The risk assessment was reviewed to identify any changes in exposure or toxicity that would impact protectiveness. Total chromium, hexavalent chromium, and arsenic were selected as the contaminants to address for soil. Total chromium was selected as a contaminant of concern for groundwater. Potential exposure pathways identified in the 1989 ROD included airborne particulate matter and direct exposure to soil, surface water, and groundwater. Receptors of these pathways include nearby residents and on-Site workers.

The risk assessment in the 1989 ROD concluded:

- Exposure to on-Site soils via migration of air was determined to be negligible due to paving over areas of elevated concentrations prior to the writing of the ROD. Exposure to on-Site soils via direct contact was negligible due to paving.
- Exposure to contaminated groundwater off-Site was evaluated and determined to be below drinking water standards for chromium for nearby receptors and therefore insignificant; however, ongoing containment and remediation would be needed to prevent further downgradient migration.

Exposures to the chemicals noted above are known to cause adverse health effects such as gastrointestinal and neurological effects, as well as impacting lung and kidney functions. Hexavalent chromium and arsenic are known carcinogens.

No new exposure pathways were identified. No new methodologies to determine risk more accurately were identified during this Five-Year Review. Groundwater cleanup levels are based on state drinking water standards and are not addressed further. Soil cleanup levels are risk-based and are discussed below.

To evaluate the protectiveness of the cleanup standards for this Five-Year Review, those standards were compared to EPA's current regional screening levels (RSLs). The RSLs for cancer are chemical-specific concentrations for individual contaminants that correspond to an excess cancer risk level of 1×10^{-6} (or a hazard quotient of 1 for non-carcinogens), and they have been developed for a variety of exposure scenarios (e.g., residential, commercial/industrial). RSLs are not de facto cleanup standards for a Superfund site, but they do provide a good indication of whether actions may be needed to address potential human health exposures. The EPA acceptable risk range is between 1×10^{-6} and 1×10^{-4} . RSL values that are within this range are determined from a risk standpoint to be acceptable.

Chemical-specific ARARs identified in the 1989 ROD for soil were evaluated (Table F-1). The Remedial Action Plan established the total chromium soil cleanup goal based on a risk assessment to prevent the exceedance of the drinking water standard in groundwater through the potential leaching of chromium from soil. Arsenic is a risk-based cleanup goal at 10^{-5} for commercial workers.

EPA selected soil cleanup levels for commercial workers in the 1989 ROD and 2003 ESD. EPA adopted RSLs as soil cleanup levels for commercial worker exposures. EPA's Integrated Risk Information System

updates toxicity values used by EPA in risk assessment when newer scientific information becomes available, and the most recent update available for the Five-Year Review was in November 2020.

Table F-1. Summary of Commercial Workers Soil RSLs (November 2020) for Chemicals at the Site

Chemical	RSL MCL-based SSL (mg/kg)	CA DTSC Human Health Screening Levels (mg/kg)	Protective cancer risk range (mg/kg)	Basis for Cleanup Level	Selected Cleanup Level (mg/kg)	Current Industrial RSL (mg/kg)	RSLs More or Less Stringent than Cleanup Levels?
Total chromium	1.8E+05	1.0E+05	1.8E+04 to 1.8E+06	Based on 1×10^{-5} lifetime noncancer target risk	100	1.8E+06 (n)	Less stringent
Hexavalent chromium	--	6.2	6.2 to 620	Based on 1×10^{-5} lifetime cancer target risk	42	6.3 (c)	More stringent
Arsenic	0.29	0.36	0.29 to 2.9	Based on 1×10^{-5} lifetime cancer target risk	27	3 (c)	More stringent

c = cancer, n = noncancer, RSL = Regional Screening Level, MCL = maximum contaminant level, SSL = soil screening levels, A dash represents that no value is provided in the RSL table

The evaluation of RSLs and the selected cleanup levels indicate that the current cleanup levels are within the protective cancer risk range for chemicals in soil.

Ecological Review

Ecological risks to the contamination at Coast Wood Preserving were determined to be minimal in the 1989 ROD. The concern regarding ecological exposure via surface water flows from the Site was evaluated; however, the potential exposure of biological receptors in downstream ditches and streams was determined to be negligible. No changes in Site conditions, receptors, or exposure pathways that could affect ecological risks were noted in the past five years.

Appendix F: Public Notice

DECLARATION

I am a resident of Los Angeles County, over the age of eighteen years and not a party to or interested in the matter noticed.

The notice, of which the annexed is a printed copy appeared in the:

UKIAH DAILY JOURNAL

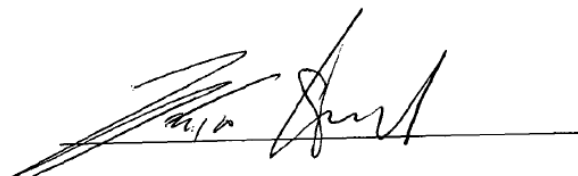
On the following dates:

03/30/2021


I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Dated at Los Angeles, California, this

1st day of April 2021



Curtis Small
Signature



U.S. EPA WANTS TO HEAR FROM YOU ON THE COAST WOOD PRESERVING SUPERFUND CLEANUP

The U.S. Environmental Protection Agency (EPA) and the California Department of Toxic Substances Control (DTSC) have started the sixth Five-Year Review of the cleanup plan for the Coast Wood Preserving Superfund site. The review will include the site's groundwater removal and treatment system and soil cleanup. The site is located at the southwest corner of Taylor Drive and Plant Roads on the southern side of Ukiah, Calif.

Federal law requires EPA to review its cleanup plans every five years:

- if a cleanup takes more than five years to complete; or
- if hazardous waste is still on-site.

What is included in the review?

The 2021 Five-Year Review includes:

- an inspection of the site and its cleanup technologies;
- a review of site data and maintenance records; and
- a review of any new laws or requirements that could affect the cleanup.

EPA and DTSC Would Like to Hear From You!

We would like to interview community members about how you think the site cleanup is going. If you would like to learn more about the site and/or be interviewed, please contact the site's project manager below before April 30, 2021:

- Tu Nguyen, EPA, 415-972-3443, nguyen.enth@epa.gov

Where can I learn more?

For more information, visit the site's webpage at www.epa.gov/superfund/coastwoodpreserving

EPA has also set up information repositories holding paper copies of the site's Administrative Record, which includes key documents and reports used in the cleanup. The repositories are free to view:

Mendocino County Library
105 N. Main Street
Ukiah, CA 95482
*Note please call the library for current hours of operation: (707) 746-4490

California Department of Toxic Substances Control (DTSC) File Room
700B Main Avenue
Berkeley, CA 94710
*Note please call for current hours of operation: (510) 540-3800

EPA will complete the Five-Year Review report no later than September 30, 2021. Once complete, EPA and DTSC will post a copy on the site's webpage and send a copy to the site information repositories listed above.

Background

EPA added the Coast Wood Preserving site to the Superfund program in September 1989. The site is an eight-acre, active wood treatment facility located three miles south of Ukiah, Calif. Past operations on site resulted in chromium and arsenic polluting the soil and groundwater beneath the facility. Past actions to protect human health and the environment from site pollution included removing polluted soil and installing a concrete cover over the entire site. Both actions reduced the pollution from going into ground water. EPA currently runs a groundwater removal and treatment system to clean up pollution and regularly monitors groundwater.

CNSB3447040

