SITE CHARACTERIZATION REPORT AND DRAFT REMOVAL ACTION WORKPLAN FOR CRESCENT MILLS INDUSTRIAL SITE 15690 CALIFORNIA HIGHWAY 89 CRESCENT MILLS, CALIFORNIA

Prepared for:

Sierra Institute for Community and Environment
4438 Main Street / PO Box 11
Taylorsville, California 95983

Prepared by:

Sierra Streams Institute
13075 Woolman Lane
Nevada City, California 95959

March 2019

US EPA Region 9
75 Hawthorn Street
San Francisco, CA 94105

Attention: Mr. Eric Byous

Project: Crescent Mills Industrial Site/Indian Valley Wood Utilization Campus
15690 California Highway 89
Crescent Mills, California

Transmittal: Site Characterization Report and Draft Removal Action Workplan

Dear Mr. Byous:

Sierra Streams Institute prepared this Site Characterization Report and Draft Removal Action Workplan (RAW) to describe proposed cleanup activities at the Crescent Mills Industrial Site, the future site of the Indian Valley Wood Utilization Campus located in Crescent Mills, California. The approximately 26.27-acre former lumber mill site is located at 15690 California Highway 89 along the western edge of the Indian Valley and to the west of Indian Creek. This report summarizes the results of several previous assessments of the Site including a Targeted Site Investigation performed by Geosyntec in 2017, evaluates remedial alternatives, presents recommended remedial actions and describes procedures for conducting the remediation.

If you have any questions regarding this Site Characterization Report and Draft RAW, please contact the undersigned.

Sincerely,

Sierra Streams Institute

Kyle Leach, P.G. 7108
Project Geologist

copies: Sierra Institute for Community and Environment/ Attn: Camille Swezy
Plumas County Department of Environmental Health/ Attn: Jerry Sipe

TABLE OF CONTENTS

ATTACHMENTS

FIGURES

TABLES

APPENDICIES

LIST OF ACRONYMS

AOC	Area of concern
APN	Assessor's Parcel Number
ARAR	Applicable, relevant and appropriate requirements
ASTM	American Society for Testing and Materials
bgs	Below ground surface
BMP	Best Management Practice
Cal/EPA	California Environmental Protection Agency
CCR	California Code of Regulations
CDFW	California Department of Fish and Wildlife (CDFW)
CFR	Code of Federal Regulations
COC	Constituent of concern
COPC	Constituent of potential concern
cy	Cubic yards
CDP	Dust Control and Decentamination Plan
DTSC	California Department of Toxic Substances Control
DTSC SL	DTSC Screening Level
EE/CA	Engineering Evaluation/Cost Analysis
EPA	United States Environmental Protection Agency
HHRA	Human Health Risk Assessment
HSC	California Health and Safety Code
H:V	Horizontal to vertical
LUC	Land use covenant
mg/kg	Milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
O&M	Operation and maintenance
PEA	Preliminary Endangerment Assessment
ppm	Parts per million
RAO	Remedial action objective
RAW	Removal Action Workplan
RCRA	Resource Conservation and Recovery Act
RSL	Regional Screening Level
RWQCB	California Regional Water Quality Control Board
sf	Square feet
SFRWQCB	San Francisco Bay Regional Water Quality Control Board
SI	Sierra Institute
SSI	Sierra Streams Institute
SSP	Site Safety Plan
STLC	Soluble Threshold Limit Concentration
WET	Waste Extraction Test
µg/dL	Micrograms per deciliter
µg/L	Micrograms per liter
USFWS	U.S. Fish and Wildlife Service

EXECUTIVE SUMMARY

On behalf of The Sierra Institute for Community and Environment (SI), Sierra Streams Institute (SSI) prepared this Site Characterization Report and Removal Action Workplan (RAW) to describe remedial action to be performed at the Crescent Mills Industrial Site (the Site), the future Indian Valley Wood Utilization Campus. The Site is located at 15690 California Highway 89 in Crescent Mills, California, and is a former lumber mill facility. SSI prepared the RAW pursuant to California Health and Safety Code (HSC) Chapter 6.8, Sections 25323.1 and 25356.1, California Senate Bill 1706, and the National Contingency Plan (NCP). The purpose of this RAW is to describe procedures for conducting remedial activities to address recognized environmental conditions (RECs) associated with past Site use. The RAW presents remedial action objectives, evaluates potential remedial actions, proposes an implementation plan for the recommended remedial alternative, and provides a verification soil sampling plan to document that remedial action objectives are achieved.

Site Description

The Site is located in Crescent Mills, California in the southwestern portion of Indian Valley, to the west of Indian Creek. The Site comprises three parcels identified by the Plumas County Assessor's Parcel Numbers (APNs) as 111-050-065, 111-050-066, and 111-050-067. The ground surface elevation of the Site is approximately 3,510 feet above mean sea level. Site topography is relatively flat, with drainage from the Site to the east towards Indian Creek. Surface drainage at the Site is directed towards the creek.

The Site is currently vacant with the exception of lumber mill remains including stockpiles of wood waste and soil, asphalt paving, concrete floor slabs, building foundations, and residual construction and industrial debris. The property is secured with a perimeter fence. The Site is zoned as heavy industrial by the Plumas County Planning Department (Plumas County GIS Division, 2017).

Site Characterization Investigation

Several geotechnical and environmental investigations have been conducted at the Site from 1991 to 2018, including soil investigation activities performed by SSI in 2017 and 2018 to provide additional pre-purchase information regarding environmental and geotechnical conditions at the Site and to investigate potential sources of on-site fill soil:

- Property Transfer Environmental Site Assessment (CH2M Hill, 1991);
- Supplemental Site Investigation Report (Geocon, 2002);
- Phase 1 Environmental Site Assessment (E&E, 2014a);
- Targeted Brownfields Assessment Report (E&E, 2014b), and
- Targeted Site Investigation (Geosyntec, 2017)
- Southern Area Site Characterization (SSI, 2018)

- Summary of On-Site Fill investigation Results (SSI, 2018, revised 2019)

The Geosyntec Targeted Site Investigation (TSI) summarized the results of the previous investigations prior to 2017 and additional soil and groundwater investigation conducted by Geosyntec in 2017 (Figure 3). The report identified several recognized environmental concerns (RECs) at the Site. The RECs associated with past use of the Site as a lumber mill which are addressed in the RAW include:

- Sawmill, Green Chain, and Sorter/Stacker Building area: Historical application of antistain on lumber, use of polychlorinated biphenyls (PCB) containing transformers, and presence of a septic tank;
- Boiler Building and Boiler Fuel Shed area: Fuel used to power the boiler, ash and other waste generated by boiler, and chemicals associated with boiler maintenance;
- Maintenance shop and Old Planing Mill/Oil Shed area: Vehicle and equipment maintenance, chemical storage including a waste oil aboveground storage tank (AST) and possible presence of an underground storage tank (UST), and observations of stained soil near the maintenance shop trench drain and oil soaked sawdust in the oil shed;
- New Planing Mill: PCB containing transformers and oil dispensing unit, and an end-seal application area;
- Old Dry Kiln Piping: Aboveground piping covered in a tar like substance and indication of petroleum hydrocarbon odor in soil;
- Possible Fueling Area ASTs and USTs: ASTs of unknown contents and USTs that were removed from the Site but not sufficiently investigated during previous investigations;
- Former Mill Roads: Historical practice of spreading ash and waste oil on the dirt mill roads; and
- Wood Waste and Soil Stockpiles: Boiler and teepee burner ash disposed of in the wood waste stockpiles at the Site.

Results of soil and groundwater sampling conducted for the TSI indicated the following constiuents of potential concern (COPCs) in soil and groundwater at the Site:

- Metals (Arsenic)
- Dioxin and Furans
- Poly Aromatic Hydrocarbons (PAHs)
- Total Petroleum Hydrocarbons (TPH) and Volatile Organic Compounds (VOCs)
- Anti-staining Agents (PCP and 2,4,6 TCP)
- Polychlorinated Biphenyl (PCB)

Of these COPCs, Arsenic and TPH-diesel were the primary COPCs detected in Site soil at concentrations exceeding Regional Screening Levels (RSLs) (U.S. EPA, 2018) or site-specific background concentration in the TSI. TPH-motor oil was also elevated in some samples but was generally below RSLs. Relatively low levels of dioxins and furans were also detected in shallow soil at the Site. Other COPCs were either not

detected in Site soils, detected at relatively low levels below or slightly above RSLs, or were not reported in soil with laboratory method detection limits (MDLs) greater than screening levels.

In October 2017, SSI performed additional soil sampling and analysis to complete characterization of the southern portion of the Site and for use in a human health risk assessment for the Site (Figure 3). The purpose of the additional soil sampling and analysis was to further characterize soil conditions in the southern portion of the Site and to determine the extent of any COPCs exceeding established RSLs or the site specific background arsenic concentration. A subsurface investigation of the areas of soil and wood waste stockpiles was also conducted to identify potential on-site sources of fill material which could be used during Site remediation and redevelopment.

Environmental sampling and analysis of surface samples indicate significant concentrations of COPCs were not detected in areas tested in the southern portion of the Site including; mill road surfaces, the former log storage area, the southern log deck recycling pond and from wood waste stockpile 5. The three bulk composite samples obtained from soil and wood waste stockpiles in the southern portion of the Site were selected from soil horizons within the trenches and potholes which appeared to have the lowest organic content. Results of the geotechnical evaluation and in particular the organic content of all three soil samples testing indicate the fill from these stockpiles is not suitable for use as structural fill. Selected fill may be acceptable for use in landscaped or vegetated buffer areas provided additional environmental sampling and analysis indicates the soil meets DTSC criteria for clean fill (DTSC, 2001).

Human Health Risk Assessment

A Screening Level Human Health Risk Assessment (SLHHRA) was performed by EKI Environment and Water, Inc. (EKI). The SLHHRA assumed that the Site would be capped by placement of clean fill or hardscape over all areas with surface soil exceeding site specific contaminant screening levels and that a municipal water supply source will provide water for future, which is consistent with the proposed remedy in this RAW. The SLHHRA evaluated risk to potential Site receptors including construction workers, industrial workers and maintenance workers assuming a future Site use as an industrial facility. Screening levels for these receptors were based on screening levels established by DTSC/U.S. EPA for industrial and maintenance workers and by the San Francisco Bay Regional Water Quality Control Board (SFRWQCB) for construction workers and the site specific background arsenic concentration in near surface soil. Arsenic in soil exceeding the site background levels was identified as the primary COC and risk driver at the Site. The SLHHRA concluded that the proposed Site remediation of placing cover soil or hardscape over impacted areas would be protective of future site workers provided adequate engineering and institutional controls are implemented. A copy of the SLHHRA is included in Appendix D.

Ecological Scoping Assessment

A Draft Ecological Scoping Assessment (ESA) of the Crescent Mills Industrial Site was prepared by SSI. The scope of the ESA included desktop review of the natural diversity database maps and other documents and a site survey to observe whether special status species or habitat was present at the Site. The ESA did not identify the presence of any state or federally listed threatened or endangered species at the Site. No riparian habitat was identified on the Site likely due to the previous Site use as a lumber mill/ industrial facility. Several threatened or endangered species or potential habitat were identified on the adjacent property to the east (Caltrans wetland mitigation site). Based on biological survey protocols for potential species of concern, one additional site survey would be required in the month of May or June in order to confirm the results of the original surveys. A copy of the Draft Ecological Scoping Assessment is presented in Appendix E.

Evaluation of Remedial Alternatives

SSI evaluated four soil remediation alternatives for the Site including: (1) No Action, (2) Excavation and Off-Site Disposal, (3) On-Site Cover Placement with institutional controls, and, (4) A phased implementation of Alternative 3 with institutional controls. The short- and long-term aspects of three criteria (effectiveness, implementability and cost) were used to guide the development and screening of remedial alternatives.
The No Action alternative was ruled out due to ineffectiveness. The Excavation and Off-Site Disposal alternative was ruled out due to the extremely high cost of off-site transport and disposal of contaminated soil at a Class 2 landfill and fill placement and likely public disapproval of the resulting large volume of truck transport. The On-Site Cover Placement with institutional controls alternative was considered effective and implementable, however estimated costs to remediate the entire Site exceeded currently available grant funds. A Phased approach to the On-Site Cover Placement with institutional controls alternative was considered effective, implementable and could be accomplished within the available budget.

Selected Remedial Alternative

Alternative 4 - Phased Implementation of Alternative 3, On-Site Cover Placement with Institutional Controls is the selected remedial alternative based on affordable costs consistent with available grant funding, relatively high levels of protection of human health and improvements in protection of water quality.

The scope of Alternative 4 includes a phased approach to Site remediation and redevelopment. Clean fill soil from an on-site borrow area will be placed over redevelopment areas where existing soil exceeds cleanup goals. This alternative also includes excavation of stockpiled wood waste or other soil or surface debris located on the site in areas within the 100-year flood plain. The excavated material would be relocated to an area of the site above the assumed 100 year flood elevation. The volume

material relocated out of the flood plain will be greater than or equal to the volume of fill placed within the flood plain.

Alternative 4 would provide for institutional controls, including fencing to restrict access to areas of the site not yet remediated, signs informing site occupants and the public of potential toxic chemical exposure risks, an operation and maintenance plan and an LUC stipulating that areas of soil cover would not be disturbed. Land use would be restricted to industrial use.

Proposed Remedial Measures

Proposed remedial actions at the Site would include the following activities:

Delineation of Site borrow area and areas to be remediated, volumes of stockpiled wood waste and surface preparation rubble to be removed and processed or relocated within the Site.

Clearing and Grubbing and excavation of wood waste stockpiles to be relocated in the southern portion of the Site outside the 100-year flood plain.

Surface preparation of borrow area and fill placement areas including excavation of relic asphalt and concrete surface material, moisture conditioning and compaction of subsoil. Excavated concrete and asphalt will be crushed and used as fill in areas not proposed for redevelopment by structures or roadways.

Placement of a minimum of one-foot of clean compacted fill soil or hardscape such as asphalt of concrete over areas proposed for redevelopment where existing soil exceeds remedial goals. Imported fill soil (if any is used) must comply with DTSC's "Clean Fill Advisory'.

Installation of temporary fencing and signage to restrict access to areas of the Site where remediation has not yet been completed or where soil remains at concentrations above cleanup goals.

Post-Construction Phase: Institutional Controls including land use covenant and O&M agreement.

Public Participation

Sierra Institute (SI) prepared a Community Profile for the project vicinity. SI will work with Plumas County Environmental Health Department to conduct the appropriate and necessary public participation activities prior to and during the proposed removal action. A copy of the Draft RAW will be available for public review during a 30 day public comment period. All comments will be addressed in a Response to Comments Memo. The Final RAW will incorporate public comments as warranted. Appendix I is a copy of the Community Profile Report prepared by SI for the project.

INTRODUCTION

Sierra Streams Institute (SSI) prepared this Site Characterization Report and Removal Action Workplan (RAW) on behalf of the Sierra Institute for Community and Environment to evaluate remedial alternatives and describe procedures for conducting remedial activities associated with recognized environmental conditions at the Crescent Mills Industrial Site (Site), a former lumber mill facility and the future home of the Indian Valley Wood Utilization Campus. The project is funded by EPA Brownfields Assessment and Cleanup Grants. The Site is located along California Highway 89 in Crescent Mills, California in the southwestern portion of Indian Valley, to the west of Indian Creek (Figure 1). The Site comprises three parcels identified by APNs: 111-050-065, 111-050-066, and 111-050-067.

The requirement for preparation of a RAW was created by California Senate Bill 1706 in 1994. The RAW is one of two remedy selection documents that may be prepared for a hazardous substance release site pursuant to Section 25356.1 of the California Health and Safety Code (HSC). A RAW was chosen over a Remedial Action Plan (RAP) because the proposed remediation is not an emergency action, and the estimated cost of the recommended remedial action is projected to be less than the RAP threshold cost of $2,000,000.

The remedial action outlined in this RAW is to be conducted in a manner consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP; 40 Code of Federal Regulations (CFR) 300.400 et seq). The NCP requires the use of an Engineering Evaluation/Cost Analysis (EE/CA) or equivalent. This RAW is the equivalent of an EE/CA and contains all the elements of an EE/CA. Section 25356.1 of the HSC outlines public participation requirements for the RAW. Requirements include the preparation of a community profile report to determine public interest in the remedial action, notice of the RAW in a newspaper of general circulation, provision of a minimum 30-day public comment period, and preparation of a responsiveness summary.

Several environmental and geotechnical investigations have been conducted at the Site between 1991 and 2018, including soil investigation activities performed by SSI in 2017 and 2018 to provide additional pre-purchase information regarding environmental and geotechnical conditions at the Site and to characterize potential sources of on-site fill soil.

Phase I and Phase II Environmental Site Assessments were performed for the Site to evaluate site conditions and develop data to use to evaluate potential risks to human health and the environment resulting from historical site use. A summary of the Phase I and II Assessments are presented in Section 2 of this RAW.

BASIS FOR REMEDIAL ACTION

Pursuant to Section 25356.1.5 of the California HSC, the proposed remedial action shall be based upon, and be no less stringent than:

- Requirements established under federal regulation pursuant to Subpart E of the NCP (40 CFR 300.400 et seq), as amended, which pertains to remedial action and selection of remedial alternatives;
- Regulations established pursuant to Division 7 (commencing with Section 13000) of the California Water Code, which pertains to state and regional water quality control;
- Applicable water quality control plans adopted pursuant to Section 13170 of the California Water Code;
- Article 3 (commencing with Section 13240) of Chapter 4 of Division 7 of the California Water Code, which pertains to water quality control plans and waste discharge requirements;
- Applicable state policies for water quality control adopted pursuant to Article 3 (commencing with Section 13140) of Chapter 3 of Division 7 of the California Water Code, to the extent that those policies are consistent with the federal regulations;
- Applicable provisions of the California HSC, to the extent those provisions are consistent with the federal regulations; and the Preliminary Endangerment Assessment (PEA) risk assessment findings.

PURPOSE

The purpose of the RAW is to evaluate remedial alternatives and to select a remedial alternative that effectively reduces, to the extent feasible, the human health risks associated with impacted soil at the Site. The evaluation considers the effectiveness, feasibility of implementation, and cost associated with each alternative. This RAW presents the recommended remedial action.

ORGANIZATION

Per Section 25323.1 of the HSC, a RAW must include a plan for conducting the remedial action, a description of the on-site contamination, the goals to be achieved by the remedial action, and the rationale for consideration of alternative removal options. This RAW contains components required by DTSC's Removal Action Workplans memorandum dated September 23, 1998, and is organized in the following sections:

1. Introduction. This section includes an overview of the proposed remedial action and associated regulations, purpose of the RAW, and organization of the RAW.
2. Site Characterization. This section includes a site description, ownership and operational history, site conditions, brief description of site characterization activities conducted, nature and extent of contamination, and description of response actions taken, if any.
3. Remedial Action Objectives. This section includes a discussion of regulations, identification and review of applicable or relevant and appropriate requirements

(ARARs), identification of media and constituents of concern, estimate of volumes, and remedial action goals.
4. Evaluation of Remedial Action Alternatives. This section includes a listing of alternative remedial measures and basis for selection of the recommended measure.
5. Remedial Procedures and Implementation. This section includes a description of techniques and methods to be employed in the remedial action, including excavation, storing, handling, transportation, treating and disposing of material on or off the site, as applicable.
6. Site Safety Plan. This section includes a brief overall description of the methods that will be employed during the removal action to ensure the health and safety of workers and the public during the removal action.
7. Public Participation. This section includes a discussion of public participation in the remedial action.
8. Remedial Action Reporting. This section includes a brief description of the post-remediation report which is to be prepared to summarize remedial activities and to document compliance with the RAW.

SITE LOCATION

The Crescent Mills Industrial Site is located on California Highway 89 in Crescent Mills, California. Figure 1 is a Site Location Map. The Site is located in the southwestern portion of Indian Valley, to the west of Indian Creek, a perennial stream which flows generally from north to south in the vicinity of the Site. The Site comprises three parcels identified by the Plumas County Assessor's Parcel Numbers (APNs) as 111-050-065, 111-050-066, and 111-050-067 which comprise a total of 26.27 acres. According to the 1994 United States Geological Survey, Crescent Mills 7.5 Minute Quadrangle topographic map, the ground surface elevation of the Site is approximately 3,510 feet above mean sea level. Site topography in this portion of Indian Valley is relatively flat, with drainage from the Site to the east towards Indian Creek. Surface drainage at the Site is directed towards the creek through overland flow and storm drains.

According to the Crescent Mills Quadrangle map (United States Geological Survey, 1994 and 2018), the Site is located in the southeastern portion of Section 24 Township 26 North, Range 9 East and the western portion of Section 19, Township 26 North, Range 10 East. The center of the Site is located at latitude 40.0946 degrees north, longitude -120.9101 degrees west.

SITE DESCRIPTION AND CURRENT SITE USES

The Site is currently vacant with the exception of lumber mill remains including stockpiles of wood waste and soil, asphalt paving, concrete floor slabs, building foundations, and residual construction and industrial debris. The southern area of the Site is occupied by three wood waste and soil stockpiles, former mill roads extending from the northern areas of the Site to and around the stockpiles, an earth berm and

ditch drainage structures which direct site runoff to a pond identified as the southern log deck recycling pond, located along the southeast edge of the site. The pond was dry at the time of an October 2017 investigation. The property is secured with a perimeter fence. The Site is zoned as heavy industrial by the Plumas County Assessor's office (Plumas County GIS Division, 2017). Figure 2 is a Site Map showing property boundaries and current site features.

ADJACENT PROPERTY

The Site is located in an area of mixed use, adjacent to a railroad to the west, the Mount Huff Golf Course to the south, a riparian area and Indian Creek to the east, and the former Sacramento Valley Moulding facility which formerly made wood moulding and currently contains abandoned structures and storage units to the north. A Pacific Gas and Electric electrical substation is located on a small parcel inset into the western central portion of the site between the Site and the railroad tracks near the center of the western property boundary. Nearby surroundings of the Site include various residential and commercial properties in the town of Crescent Mills situated adjacent to the Site to the west across the railroad tracks and California Highway 89. Riparian areas and meadows of Indian Valley are situated to the north, east, and south of the Site. Mountains are found to the west of the town of Crescent Mills and beyond the Indian Valley in all directions.

GEOLOGIC SETTING AND CONDITIONS

Indian Valley is underlain by Quaternary-aged alluvium deposited by Indian Creek, as indicated by the United States Geological Survey (USGS) Bulletin 353 on the Geology of the Taylorsville Region, (USGS, 1908). Indian Valley is surrounded by mountains of complex geologic origin formed by uplift, folding, faulting, and volcanic activity related to the formation of the Sierra Nevada mountain range. The mountains in the Indian Creek watershed are predominately of metamorphic origin and are pre-Silurian to Cretaceous in age. There are also some formations of more recent Tertiary age andesitic bedrock of volcanic origin within the Indian Creek watershed.

Boring logs from previous investigations and this investigation at the Site and the adjacent property to the north indicated that the soil beneath the Site is composed of an amalgamation of sand, silt, and gravel, which is typical of an alluvial floodplain.

SOIL CONDITIONS

According to July 2014 Phase I Environmental Site Assessment of the Site prepared by Ecology and Environment Inc. (E&E), soils beneath the Site are mapped as Plumas variant, which are deep and moderately deep, moderately well and well-drained soils with moderately coarse textures. Soils beneath the Site are characterized as having moderate infiltration rates. According to a November 20, 1992 *Assessment of Soil and*

Groundwater Contamination, Sacramento Valley Moulding Facility, prepared by Resna (Resna 1992), native soil below the adjacent Sacramento Valley Moulding site consists of mixtures of sand and silt with gravel down to the total explored depth of approximately 20 feet below ground surface (bgs). Because the subject Site and the Sacramento Valley Moulding site are located in the same geologic environment and at a similar elevation, soil below the subject Site is anticipated to be similar to that at the Sacramento Valley Moulding site.

GROUNDWATER CONDITIONS

Groundwater at the Site and at the adjacent property to the north was reported at shallow depths from approximately 5 to 10 feet bgs during past investigations (Resna, 1992; Geocon, 2002; E&E, 2014b). Groundwater flow beneath the Sacramento Valley Moulding site adjacent and north of the Site, was reported in 1992 to be in a southeast direction at 0.01 feet/foot in shallow monitoring wells installed to assess impacts from a leaking UST, located cross-gradient to the Site (Resna, 1992). Static groundwater was observed at a depth of approximately 5.5 feet bgs in a trench advanced in the east central portion of the Site in June 2018.

SURFACE WATER CONDITIONS

The Site is located approximately 300 feet west of Indian Creek (USGS, 2012). The majority of the Site is within or along the western edge of the 100 year floodplain of Indian Creek (FEMA, 2018). Previous Site investigations and communication with Plumas County Environmental Health Department suggest much of the Site was flooded in 1986 and 2009. A portion of the Site was flooded as recently as February 2017.

SITE HISTORY

The Site history was summarized by CH2M Hill (1991) and E&E (2014a). The Site was initially developed as a lumber mill in the late 1940s to early 1950s. Before the lumber mill was built, the property was likely used for agriculture. The Site was reportedly purchased by Louisiana Pacific (LP) in the early 1970s and the mill was expanded. Prior to the acquisition by LP, the mill facilities reportedly included a planing mill, several dry kilns, a boiler, office buildings, dry lumber storage sheds, several USTs, and a teepee burner for burning wood waste (which is currently located off Site; see Figure 3). The structures were predominantly on the north and west portions of the Site. After purchasing the Site, LP added several features to the facilities including a log deck recycle pond, a sawmill facility, additional dry kilns, a planing mill, and a wood waste disposal area, which was reportedly located outside of the current property boundaries adjacent to the creek. LP reportedly operated the Site as a lumber mill until it was closed in 1986. Based on available aerial imagery of the Site, structures appeared to have been gradually removed after the lumber mill closed. Greg Lehman and siblings purchased the property from LP in 1998. In 2002, the California Department of Transportation (Caltrans) purchased the eastern portion of the Site along Indian Creek

from Mr. Lehman for a wetland and riparian mitigation area. Fill was reportedly excavated from the Caltrans property and stockpiled in the former log deck area in the southern portion of the subject Site. The Site was purchased by Sierra Institute for Community and Environment in October 2017. Aerial imagery indicated that the Site was cleared of structures by 1998, except for building foundations and residual debris, and remained relatively unchanged from 1998 to present.

PREVIOUS SITE INVESTIGATIONS

Several environmental and geotechnical investigations have been conducted at the Site from 1991 to 2018, including soil investigation activities performed by SSI in 2017 to provide additional pre-purchase information regarding environmental and geotechnical conditions at the Site:

- Property Transfer Environmental Site Assessment (CH2M Hill, 1991);
- Supplemental Site Investigation Report (Geocon, 2002);
- Phase 1 Environmental Site Assessment (E&E, 2014a);
- Targeted Brownfields Assessment Report (E&E, 2014b), and
- Targeted Site Investigation (Geosyntec, 2017).
- Southern Area Site Characterization (SSI, 2018)
- Summary of On-Site Fill investigation Results (SSI, 2018, revised 2019)

Copies of the 2017 Geosyntec Targeted Site Investigation (TSI) and the 2017 SSI, Southern Area Site Characterization and a Summary of the Results of On-Site Fill Investigation Results (SSI, 2018, revised 2019) are included in Appendices A, B and C respectively. Other reports related to the site are available for review at https://sierrainstitute.us/

TARGETED SITE INVESTIGATION

The Geosyntec TSI summarized the results of previous investigations conducted between 1991 and 2017, including results of additional soil and groundwater investigations conducted by Geosyntec in 2017, discussion and conclusions regarding environmental conditions, and recommendations for Site remediation, which are presented below. A Copy of the TSI Report is included in Appendix A.

AREAS OF CONCERN

Based on historical information, the Site was operated as a lumber mill from the late 1940s to 1986. Previous investigations at the Site documented impacts to soil and groundwater associated with the former Site use. The TSI report identified several recognized environmental concerns (RECs) at the Site (see Appendix A Figure 2):

- Sawmill, Green Chain, and Sorter/Stacker Building area: Historical application of antistain on lumber, use of PCB containing transformers, and presence of a septic tank;

- Boiler Building and Boiler Fuel Shed area: Fuel used to power the boiler, ash and other waste generated by boiler, and chemicals associated with boiler maintenance;
- Maintenance shop and Old Planing Mill/Oil Shed area: Vehicle and equipment maintenance, chemical storage including a waste oil aboveground storage tank (AST) and possible presence of an UST, and observations of stained soil near the maintenance shop trench drain and oil soaked sawdust in the oil shed;
- New Planing Mill: PCB containing transformers and oil dispensing unit, and an end-seal application area;
- Old Dry Kiln Piping: Aboveground piping covered in a tar like substance and indication of petroleum hydrocarbon odor in soil;
- Possible Fueling Area ASTs and USTs: ASTs of unknown contents and USTs that were removed from the Site but not sufficiently investigated during previous investigations;
- Former Mill Roads: Historical practice of spreading ash and waste oil on the dirt mill roads; and
- Wood Waste and Soil Stockpiles: Boiler and teepee burner ash disposed of in the wood waste stockpiles at the Site.

Figure 3 is a Site Map showing Decision Units and Sample Locations from the TSI and other investigations.

CONSTITUENTS OF POTENTIAL CONCERN

Results of soil and groundwater sampling conducted for the TSI indicated the following constituents of potential concern (COPCs) in soil and groundwater at the Site (see Appendix A Tables 1 to 10):

- Metals (Arsenic)
- Dioxin and Furans
- Poly Aromatic Hydrocarbons (PAHs)
- Total Petroleum Hydrocarbons (TPH) and Volatile Organic Compounds (VOCs)
- Antistaining Agents (PCP and 2,4,6 TCP)
- Polychlorinated Biphenyl (PCB)

Of these COPCs, Arsenic and TPH-diesel were the primary COPCs detected in Site soil at concentrations exceeding Regional Screening Levels (RSLs) (U.S. EPA, 2018) or site-specific background concentrations in the TSI. TPH-motor oil was also elevated in some samples but was generally below RSLs. Relatively low levels of dioxins and furans were also detected in shallow soil at the Site. Other COPCs were either not detected in Site soils, detected at relatively low levels below or slightly above RSLs, or were not reported in soil with laboratory method detection limits (MDLs) greater than screening levels.

TSI REPORT CONCLUSIONS AND RECOMMENDATIONS

Additional soil and groundwater samples were collected as part of the TSI investigation to address data gaps and assess the extent of the remaining impacts. The Site was evaluated using applicable commercial/industrial screening levels based on the planned future commercial/industrial use. Based on the results of the TSI investigation and review of previous investigations, the 2017 Geosyntec TSI presented the following conclusions:

- Of the COCs remaining at the Site above the compound-specific screening levels, arsenic in soil appears to be the most wide-spread, being found in most soil borings and Incremental Sampling Methodology (ISM) samples at concentrations that were above the site-specific background concentration. Solubility tests and groundwater data indicate that the arsenic reported in soil has not resulted in groundwater impacts at the Site. The source of arsenic that is present throughout the Site may be related to lumber mill operations, but could also potentially have been present in the import fill material brought to the Site to raise the surface grade. The import fill may have been derived from off-Site mining operations, as the Crescent Mills area has several reported gold mines and arsenic is commonly found to be associated with gold deposits (Straskraba and Moran, 2006). Whether the source of arsenic is from fill imported from off-Site or due to uses at the Site, arsenic concentrations reported in shallow soil exceed the established site-specific background concentration across a majority of the Site.
- TPH-diesel was also reported in soil in numerous locations at the Site in exceedance of screening levels. TPH-d was reportedly stored at the Site, used to operate the boiler and various other machinery, and may have been spread on former mill roads along with waste oil for dust suppression. TPH-d was found above the screening level in the boiler area and in samples from nearly all of the former mill roads. TPH-motor oil was also reported in these samples but at concentrations below the applicable screening level. PAHs and PCP were reported in soil with MDLs greater than the screening level. Due to limitations of the currently available laboratory methods and the presence of either COC-derived or naturally occurring matrix interferences, the MDLs and RLs for these analytes were reported above the applicable screening levels. However, based on the lack of positive detections above MDLs in soil at the Site for either PCP or PAHs, their potential presence is unlikely at concentrations that would be a concern.
- Dioxins and furans were reported in groundwater near the saw mill, boiler building, and former AST area at concentrations in exceedance of the RSLs but less than the Maximum Contaminant Level (MCL), with exception of one estimated dioxin and furan result from near the boiler building that exceeded the MCL. However, this result appeared to be a false positive due to laboratory validation of the data. Dioxins and furans in soil were not detected above applicable screening levels. PAHs and TPH-d were reported in groundwater above their respective screening criteria near the maintenance shop.

- Hexavalent chromium was reported in groundwater by the laboratory at an estimated concentration in exceedance of the MCL, however the associated equipment blank also had low concentrations of hexavalent chromium, causing the sample to be reported as not detectable above the laboratory reporting limit.
- In general, the reported concentrations of groundwater constituents were narrowly above the screening levels and may have been influenced by elevated turbidity introduced by the collection method.
- A geophysical survey was conducted to attempt to locate a possible UST that remained near the maintenance shop at the Site. The survey was inconclusive but identified several buried metal anomalies including two that were reported as a possible UST and one that was indicated as a possible sewer pipe. Soil borings were advanced adjacent to and downgradient of the possible locations of a remaining UST and results indicated that limited PAH impacts were present in groundwater at this location. Impacts may also be attributed to a former waste oil AST in this area, waste oil spreading for dust suppression that was reported at the Site, or from the former UST at the Sacramento Valley Moulding Site.
- The findings of the TSI report do not include evaluation or investigation of any adjacent or off-Site properties that may or may not be contaminated. This is particularly pertinent as the neighboring properties to the north and east were part of the former LP lumber mill and therefore had similar use as the Site.
- During this TSI, there were PAH detections in groundwater above the screening level along the northern property boundary. As mentioned in the Work Plan, the Sacramento Valley Molding Site to the north of the property had a known UST investigation conducted (Resna, 1992), therefore there is a possibility that the source of impacts observed along the property boundaries may originate off-Site.

Goesyntec made the following conclusions and recommendations based on the results of the TSI Investigation:

- The objectives of this TSI were achieved through the identification and investigation of the possible hazardous substances release sources at the Site. Further, the collected data indicate that COCs in soil and groundwater are sufficiently delineated and the potential risk to human health in a commercial/industrial land use scenario was evaluated.
- Further investigation is not necessary and the data should be used to prepare a Feasibility Study/Remedial Action Plan for selection and implementation of an appropriate remedial alternative to facilitate the development and reuse of the Site.
- Though arsenic concentrations remained below the background concentration established for the Site in some of the soil and wood waste stockpiles, the material in the stockpiles should be suitable for unrestricted use only in areas where background arsenic concentrations in soil are similar.
- The existing log deck supply well and any other wells identified on the property should be decommissioned in accordance with the PCEHD and state regulations.

PROPOSED SITE REDEVELOPMENT

The proposed reuse for the property is to redevelop the Crescent Mills site into an integrated wood products campus. The campus will utilize a variety of technologies to generate value-added wood products out of low-value woody material generated from local forest lands during restoration and fire risk reduction efforts. Businesses to be developed include a dried and packaged firewood operation, a cross-laminated timber production facility, a 3 MW bioenergy facility that will sell electricity to Pacific Gas & Electric pursuant to the Bioenergy Market Adjusting Tariff program, and a wood chip processing business to supply biomass boilers to be installed around the county. Proposed redevelopment will likely be conducted in a phased approach with the initial facilities being constructed in the western half of the northern portion of the property. Phase 1 redevelopment will likely include construction of a wood chipping facility and a bioenergy facility.

ADDITIONAL INVESTIGATION

Two additional investigations summarized below were performed to close potential data gaps identified during the TSI review process and provide additional information to support Site remediation efforts and future Site redevelopment.

SOUTHERN AREA SITE CHARACTERIZATION

SSI performed additional soil sampling and analysis in October 2017, to complete characterization of the southern portion of the site. Results were included also in a human health risk assessment for the site. The purpose of the additional soil sampling and analysis was to further characterize soil conditions in the southern portion of the Site and to determine the extent of any constituents of concern exceeding established Regional Screening Levels (RSLs) or the site-specific background arsenic concentration. A subsurface investigation of soil and wood waste stockpiles was also conducted to identify potential on-site sources of fill material which could be used during Site remediation and redevelopment.

Eleven soil samples and one duplicate soil sample were obtained from near surface soils in the southern portion of the Site and analyzed for potential COCs. Fifteen trenches and potholes were advanced in the large soil stockpiles in the southern portion of the Site. Bulk samples of soil obtained from selected stockpile locations were analyzed for geotechnical soil characterization.

Results of the investigation indicated that significant concentrations of COCs were not detected in areas tested in the southern portion of the Site including; mill road surfaces, the former log storage area, the southern log deck recycling pond and from wood waste stockpile 5. The southern log deck recycling pond is currently a depression where surface water seasonally ponds. Analytical results from the southern area soil investigation were included in the human health risk assessment for the Site presented below.

Results of geotechnical analysis of bulk composite samples obtained from soil and wood waste stockpiles in the southern portion of the Site indicate the fill from these stockpiles is not suitable for use as structural fill due to high organic content. A copy of the Southern Area Site Characterization is included in Appendix B.

ON SITE FILL INVESTIGATION

SSI conducted an on-site fill investigation in June 2018 to identify potential sources of on-site fill to be used during Site remediation or redevelopment. Eight trenches were advanced along the eastern portion of the Site in areas assumed to be outside areas of previous lumber mill operations. The investigation was performed to identify soil in general accordance with DTSC's Clean Fill Advisory (DTSC, 2001). Results of samples obtained from seven of the eight trenches indicated no COCs were detected above applicable remedial goals or screening levels. Based on an evaluation of the results of the investigation, it appears that all soil situated above groundwater (approximately 5 feet bgs) in the vicinity of trenches T-2 through T-8 could be used as a source of on-site fill during proposed site remediation activities. A Summary of the On-Site Fill Investigation Results is included in Appendix C.

ANALYTICAL LABORATORY RESULTS

The following Tables present the analytical results of soil and groundwater samples evaluated in a Screening Level Human Health Risk Assessment (SLHHRA). These tables represent applicable data used in the SLHHRA based on plausible future exposure scenarios. The complete set of investigation data for the Site are included in Appendices A to C. Results of the SLHHRA are presented below.

- Table 1 presents the Analytical Results of Metals on Soil
- Table 2 presents the Results of PAHs, TPH and VOCs in Soil
- Table 3 presents the Results of Antistaining Agents and PCBs in Soil
- Table 4 presents the Results of Dioxins and Furans in Soil
- Table 5 presents the Results of VOCs in Groundwater

HUMAN HEALTH RISK ASSESSMENT

A Screening Level Human Health Risk Assessment (SLHHRA) was performed by EKI Environment and Water, Inc. (EKI). The SLHHRA assumed that the Site would be capped by placement of clean fill or hardscape over all areas with surface soil exceeding site specific contaminant screening levels and that a municipal water supply source will provide water for future, which is consistent with the proposed remedy in this RAW. The SLHHRA evaluated risk to potential Site receptors including construction workers, industrial workers and maintenance workers assuming a future Site use as an industrial facility. Screening levels for these receptors were based on screening levels established by DTSC/U.S. EPA for industrial and maintenance workers and by the SFRWQCB for construction workers and the site specific background arsenic concentration in near

surface soil. Arsenic in near surface soil exceeding site background levels was identified as the primary COC and risk driver at the Site.

The SLHHRA concluded that the proposed Site remediation of placing cover soil or hardscape over impacted areas would be protective of Site workers and visitors, provided that construction workers performing the remediation followed HAZWOPER training protocols, that clean utility corridors with visible delineation markers be installed for protection of future maintenance workers, and that institutional controls be implemented. Institutional controls would include placement of fencing to restrict access to any areas where elevated COCs remain and that are redeveloped at this point in time. A copy of the SLHHRA is included in Appendix D.

Figure 4 is a map showing areas of the Site where arsenic in soil exceeds the site-specific background concentration and which will thus require remediation prior to redevelopment. Decision Units 16, 17, 18 and 21 are wood waste stockpiles and are not assumed to represent underlying soil conditions. Results of the On-Site Fill Investigation indicate underlying soil located beneath wood waste stockpiles in the northeast and east central portions of the Site (DU-16 and DU-17 respectively) are not impacted by arsenic above the site-specific background concentration.

ECOLOGICAL SCOPING ASSESSMENT

SSI prepared a Draft Ecological Scoping Assessment (ESA) of the Site. The scope of the ESA included desktop review of the natural diversity database maps and other documents and a Site survey conducted in March 2018 to observe whether special status species or habitat was present at the Site. The ESA did not identify the presence of any state or federally listed threatened or endangered species at the Site. No riparian habitat was identified on the Site. Several threatened or endangered species or potential habitat were identified on the adjacent property to the east of the Site (Caltrans wetland mitigation site).

Although the Site is located adjacent to a riparian corridor of Indian Creek and a wetlands mitigation site, no special status species or significant areas of potential habitat were identified at the Site, likely due to the previous Site use as a lumber mill/ industrial facility. Based on biological survey protocols for potential species of concern, one additional Site survey would be required in the month of May or June in order to confirm the results of the original surveys. Results of the follow up survey will be include in a final ESA or in an ESA addendum letter to be included in the final RAW. A copy of the Draft ESA is presented in Appendix E.

REMEDIAL ACTION OBJECTIVES OVERVIEW

Pursuant to 40 CFR 300.430, remedial action objectives (RAOs) must be established. The RAOs specify contaminants and media of concern, potential exposure pathways, and numerical remediation goals for COPCs. Numerical remediation goals for COPCs establish acceptable exposure levels that are protective of human health and the environment, and were developed by considering applicable, relevant and appropriate requirements (ARARs) under federal or state environmental laws, if available.

For known or suspected carcinogens, acceptable exposure levels are generally concentrations that represent an excess upper bound lifetime cancer risk to an individual of between one in ten thousand and one in one million, using information on the relationship between dose and response. For systemic toxicants, remediation goals shall represent concentration levels to which the human population, including sensitive subgroups, may be exposed without adverse effect during a lifetime or part of a lifetime, incorporating an adequate margin of safety.

Numerical remediation goals also consider factors related to technical limitations such as metals concentrations in ambient soil; detection/quantification limits for contaminants; factors related to uncertainty; and other pertinent information.

ARARs and TBCs

The NCP requires compliance with ARARs during remedial actions to the extent practicable. ARARs include federal, state, and local environmental laws, regulations, and standards that can be chemical-specific, location-specific, or action-specific. Chemical-specific ARARs are health-based or environmentally-based numerical limits pertaining to the amount of a contaminant released to the environment or allowed to remain in the environment as a result of the proposed remedial activity. Location-specific ARARs may restrict remedial action if the proposed action is located in an environmentally sensitive or historically significant area. Action-specific ARARs may restrict remedial action based on the specific remedial action and/or byproducts of the remedial action.

Federal and state non-promulgated standards, policies, or guidance documents, and local requirements, are not ARARs. However, according to the NCP guidance, these items are also to be considered when evaluating and selecting remedial actions necessary to protect human health and the environment. These non-promulgated, non-binding factors are designated “To Be Considered,” or “TBCs.”

CHEMICAL SPECIFIC ARARs and TBCs

<u>Resource Conservation and Recovery Act (RCRA)</u>

RCRA Subtitle C, contained in 40 CFR, pertains to the characterization of federal hazardous waste. Based on the results of soil samples obtained at the Site to date, soil from the Site does not meet federal criteria for classification as hazardous waste.

California Code of Regulations (CCR) Title 22

Section 66261 of CCR Title 22 pertains to the characterization of hazardous waste. Based on the results of soil samples obtained at the site to date, soil from the Site does not meet State criteria for classification as hazardous waste (Section 66261.24 of CCR Title 22).

Regional Screening Levels (RSLs)

RSLs established by Cal/EPA for soil based on industrial land use may be used as a screening tool for individual constituents of concern. The RSLs were developed using methodology and toxicological parameters set forth by Cal/EPA, which were used as screening levels in the site-specific SLHHRA performed as part of the RAW. The RSLs are a TBC and are applicable to the proposed remedial action as a screening tool.

Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California (40 CFR Section 131.38)

Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California (40 CFR Section 131.38) promulgates criteria for priority toxic pollutants in the State of California for inland surface waters and enclosed bays and estuaries. Numeric Criteria established in 40 CFR Section 131.38 were identified during Site characterization investigations.

DTSC-Modified Screening Levels (DTSC-SLs)

DTSC Human Health Risk Assessment Note 3 (DTSC Note 3) presents recommended screening levels (derived using DTSC-modified exposure and toxicity factors) for constituents in soil based on industrial land use, which were used as screening levels in the site-specific SLHHRA performed as part of the RAW. The DTSC-SLs are a TBC and are applicable to the proposed remedial action as a screening tool.

Environmental Screening Levels (ESLs)

The ESLs were developed by the SFRWQCB and are conservative screening levels intended to help expedite the identification and evaluation of potential environmental concerns at contaminated sites. The ESLs are a TBC and provided screening levels for construction workers, which is an exposure scenario that is not addressed by the RSLs or DTSC-SLs.

California Water Code

Division 7 of the California Water Code establishes priorities for the California Regional Water Quality Control Board (RWQCB). RWQCB guidance and numerical limits are presented in various documents. The RWQCB Basin Plan, Designated Level Methodology, Antidegradation Policy and Water Quality Goals establish policies, procedures and numerical limits for protection of surface water and groundwater quality. The proposed remedial action focuses on protection of human health and does not

propose remedial action that will significantly affect water quality provided that proper BMPs are utilized during and subsequent to proposed Site cleanup activities.

LOCATION-SPECIFIC ARARs

National Historic Preservation Act

The National Historic Preservation Act, as set forth in Sections 65 and 800 of CFR Title 36, pertains to cultural resources and historic sites. A cultural resources study and archeological report will be completed for the Site prior to implementation of the RAW. The proposed Site remediation will comply with the National Historic Preservation Act and will be performed in a manner that will not disturb significant cultural resources or historic sites, if such are identified in the study.

Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act, as set forth in Section 6.302 of CFR Title 40, pertains in part to wetlands protection and flood management. Flood-prone areas have been identified in the proposed remedial action areas. U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW) will be consulted prior to implementation of the RAW. Appropriate best management practices (BMPs) will be utilized to prevent off-site migration of soil contaminants and remedial activities will comply with Section 6.302 of CFR Title 40.

Clean Water Act

The Clean Water Act, as set forth in Section 230 of CFR Title 40, pertains to flood-prone areas and wetlands. Flood-prone areas have been identified the proposed remedial action areas. Appropriate BMPs will be implemented and remedial activities will comply with Section 230 of CFR Title 40.

ACTION-SPECIFIC ARARs

California Water Code

The California Water Code governs the characterization of waste for disposal to land. Waste disposal must comply with the provisions of the California Water Code.

Northern Sierra Air Quality Management District Rule 226

Northern Sierra Air Quality Management District Rule 226 requires that a dust control plan be prepared for construction activity disturbing more than one acre of land. The proposed remediation area, including staging and access areas, is anticipated to exceed one acre in total area. Rule 226 thus is applicable. SSI prepared a Dust Control and Decontamination Plan (DCDP), which is presented in Appendix F.

Air Resources Board Regulation 93105

Under California law, disturbance of soil and rock that contains ultramafic rock, serpentinite or naturally occurring asbestos minerals must be handled as described in Cal/EPA Air Resources Board Regulation 93105, Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. No ultramafic rock, serpentinite or naturally occurring asbestos minerals have been observed on the subject Site nor are they mapped within approximately 2 miles of the Site. Thus, Air Resources Board Regulation 93105 does not apply.

Public Resources Code 4581 and 4621

The proposed remedial activities are not expected to include significant timber operations that involve the removal of large trees. A “significant” timber operation is generally considered to involve the disturbance of more than 2.99 acres of timberland. A Timber Harvesting Plan (Public Resources Code 4581) and a Timberland Conversion Permit (Public Resources Code 4621) are not expected to be required for the proposed remedial activities.

NCP

The National Oil and Hazardous Substances Pollution Contingency Plan, more commonly called the National Contingency Plan or NCP, is the United States federal government's blueprint for responding to oil spills and hazardous substance releases. It documents national response capability and is intended to promote overall coordination among the hierarchy of responders and contingency plans. The NCP authorizes the lead agency (i.e., EPA) to initiate appropriate removal action in the event of a hazardous substance release. Decisions of action will be based on threats to human or animal populations, contamination of drinking water supplies or sensitive ecosystems, high levels of hazardous substances in soils, and other significant factors affecting the health or welfare of the public or the environment. The NCP provides a framework for evaluating removal action alternatives.

Federal Clean Air Act

The Clean Air Act is a United States federal law designed to control air pollution on a national level. The Clean Air Act would aply to any aerial releases of contaminants occurring during Site remediation. Implementation of Federal Clean Air Act requirements has been delegated, in part, to California. The Northern Sierra Air Quality Management District (NSAQMD) is the local implementing agency. Where NSAQMD requirements have been incorporated into the State Implementation Plan (SIP) and approved by EPA, they are federally-enforceable. Where NSAQMD requirements have not been incorporated into the SIP and approved by EPA, they are not federally-enforceable.

OSHA HAZWOPER

The Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) applies to employers and their employees who are exposed to or potentially exposed to hazardous substances including hazardous waste or potentially hazardous material cleanup operations. OSHA HAZWOPER training will be required for all Site workers actively engaged in Site remediation activities.

CEQA

The California Environmental Quality Act (CEQA) is a California statute passed in 1970, shortly after the United States federal government passed the National Environmental Policy Act, to institute a statewide policy of environmental protection. CEQA will apply to the proposed Site remediation and redevelopment. Plumas County will be the lead agency for CEQA.

MEDIA AND CONSTITUENTS OF CONCERN

The primary medium of concern at the Site is soil impacted by lumber mill and wood processing activities. Potential exposure pathways are associated with soil and include dermal absorption through direct contact, incidental ingestion, and inhalation of soil dust. Based on the assumption that the Site would be capped with 1 foot of clean fill or hardscape in the future, the SLHHRA identified arsenic, TPH-d, and 2,3,7,8-tetrachlorodibenzo-p-dioxin Toxic Equivalent ("2,3,7,8-TCDD TEQ") as COPCs in soil for potential future receptors. Based on the calculated representative concentrations of these COPCs in soil compared to applicable screening levels identified in the SLHHRA, only arsenic in soil was identified as the primary COC and risk driver at the Site. No groundwater COPCs were identified in the SLHHRA based on potential future receptors, either due to incomplete exposure pathways or volatile chemicals were below applicable screening levels identified in the SLHHRA.

QUANTITY ESTIMATE

An estimated 10 acres of the property are assumed to be underlain by impacted near surface soil or potentially impacted soil. Assuming an average depth of contamination of one foot, this corresponds to roughly 16,000 cubic yards (cy) of impacted soil. An additional estimated 11,500 cy of wood waste with arsenic concentrations at or exceeding site background are located in the east central portion of the site. A far greater volume of wood waste, some of which exceeds background arsenic levels, is located in the southern portion of the site, where remediation is not proposed at this time. Figure 5 depicts proposed work areas where impacted soil has been identified or may potentially be present at the site. Quantity estimates for the proposed Phase 1 remediation project are documented in the Proposed Remedial Action Section below.

REMEDIAL ACTION GOAL FOR ARSENIC

Based on the proposed Site use evaluated in the SLHHRA above, arsenic is the primary COC and risk driver for potentially exposed future populations under existing Site conditions. The remedial action goal for total arsenic in Site soil is 9.8 milligrams per kilogram (mg/kg), which is equivalent to the site specific background arsenic concentration determined in the TSI.

EVALUATION OF REMEDIAL ACTION ALTERNATIVES

Evaluation of remedial alternatives for the Site are discussed below.

SSI reviewed potentially applicable alternative soil remediation methods for the Site including: (1) No Action, (2) Excavation and Off-Site Disposal, (3) Fill Placement over all contaminated areas with institutional controls, (4) Phased implementation of Alternative 3 with institutional controls.

The review of potential soil remediation alternatives was conducted using an evaluation equivalent to an EE/CA as required by the NCP.

OVERVIEW

Pursuant to 40 CFR Part 300.430, as determined appropriate and to the extent sufficient information is available, the short- and long-term aspects of the following three criteria were used to guide the development and screening of remedial alternatives:

1. Effectiveness. This criterion focuses on the degree to which an alternative reduces toxicity, mobility, or mass of contaminants through treatment, minimizes residual risks and affords long-term protection, complies with ARARs, and minimizes short-term impacts, and how quickly it achieves protection. Alternatives providing significantly less effectiveness than more beneficial alternatives are eliminated. Alternatives that do not provide adequate protection of human health and the environment are also eliminated from further consideration.

2. Implementability. This criterion focuses on the technical feasibility and availability of the technologies each alternative would employ and the administrative feasibility of implementing the alternative. Alternatives that are technically or administratively infeasible or that would require equipment, specialists, or facilities that are not available within a reasonable period of time are eliminated from further consideration.

3. Cost. Construction cost, maintenance cost and any other long-term cost to operate and maintain the alternatives were also considered. Costs that are extremely excessive compared to the overall effectiveness of alternatives are

considered as one of several factors used to eliminate alternatives. Alternatives providing effectiveness and implementability similar to that of another alternative by employing a similar method of treatment or engineering control, but at greater cost, may be eliminated.

The analysis of alternatives under review reflects the scope and complexity of site problems and alternatives being evaluated, and considers the relative significance of the factors within each of the following nine NCP criteria:

- Overall protection of human health and the environment. Alternatives are assessed to determine whether they can adequately protect human health and the environment, in both the short- and long-term, from unacceptable risks posed by hazardous substances, pollutants, or contaminants present at the Site. Overall protection of human health and the environment draws on the assessments of other evaluation criteria, especially long-term effectiveness and permanence, short-term effectiveness, and compliance with ARARs.

- Compliance with ARARs. The alternatives are assessed to determine whether they attain applicable, relevant and appropriate requirements under federal environmental laws and state environmental or facility citing laws or provide grounds for invoking waivers from such laws.

- Long-term effectiveness and permanence. Alternatives are assessed for the long-term effectiveness and permanence they afford, along with the degree of certainty that the alternative will prove successful. As appropriate, the following factors are considered: (1) magnitude of residual risk (taking into account the volume, toxicity, mobility, and propensity to bioaccumulate); (2) compliance with ARARs; (3) long term effectiveness and permanence; (4) reduction of toxicity, mobility, or volume through treatment; (5) short-term effectiveness; (6) implementability; (7) cost; (8) state acceptance; and (9) community acceptance.

- Reduction of toxicity, mobility, or volume through treatment. The degree to which alternatives employ recycling or treatment that reduces toxicity, mobility, or volume are assessed, including how treatment is used to address the principal threats posed by the site.

- Short-term effectiveness. The short-term impacts of alternatives are assessed considering short-term risks that might be posed to the community during implementation of an alternative; potential impacts on workers during remedial action and the effectiveness and reliability of protective measures; potential environmental impacts of the remedial action and the effectiveness and reliability of mitigative measures during implementation; and time until protection is achieved.

- Implementability. The ease or difficulty of implementing the alternatives is assessed by considering technical feasibility, administrative feasibility, and availability of services and materials.

- Cost. Costs include capital costs (direct and indirect) and operation and maintenance (O&M) costs.

- State acceptance. State concerns include the state's position related to the preferred alternative and other alternatives, and state comments on ARARs or the proposed use of waivers.

- Community acceptance. Public review is to be performed to assess community support, reservations and/or opposition of components of the proposed remedial action.

The nine criteria listed above are categorized into three groups:

1. Threshold criteria. Overall protection of human health and the environment and compliance with ARARs (unless a specific ARAR is waived) are threshold requirements that each alternative must meet in order to be eligible for selection.

2. Primary balancing criteria. The five primary balancing criteria are long-term effectiveness and permanence; reduction of toxicity, mobility, or volume through treatment; short-term effectiveness; implementability; and cost.

3. Modifying criteria. State and community acceptance are modifying criteria that shall be considered in remedy selection.

The remedial alternative that best meets the requirements above is to be identified and presented to the public in this RAW. The RAW provides:

- Brief summary of the remedial alternatives;
- Discussion of the rationale that supports the preferred alternative;
- Summary of any formal comments received from the support agency; and
- Summary explanation of any proposed waiver from an ARAR.

ALTERNATIVE 1: NO ACTION

The No Action alternative includes leaving affected soil at the Site in its existing condition without engineering or institutional controls. Specific evaluation of this alternative is summarized below.

<u>Effectiveness</u>

- Does not provide adequate protection of human health and the environment
- Does not effectively reduce risks

- Does not afford short-term or long-term protection
- Does not comply with ARARs

Implementability

- Immediately implemented
- No labor, materials or equipment necessary
- Administratively infeasible based on ARARs

Cost

- No direct costs
- Unknown future costs

The No Action alternative is ineffective compared to the other remedial alternatives and does not provide adequate protection of human health and water quality. Therefore, the No Action alternative was eliminated from further consideration.

ALTERNATIVE 2: EXCAVATION AND OFF-SITE DISPOSAL

The Excavation and Off-Site Disposal alternative includes excavation of the upper foot of impacted soil having contaminant concentrations that exceed the remedial goal, backfilling with clean imported fill soil or fill derived from an on-site source, and implementing institutional controls. Verification soil sampling and analysis would be performed to confirm that the lateral extent of soil excavation meets the remedial goal and to characterize the excavated material and soil remaining at the base of the excavation. Excavated soil exceeding the remedial goal would be transported to a Class 2 landfill in accordance with applicable regulations (assumes no soil exceeds hazardous waste threshold levels). Contaminated soil excavations would be backfilled with clean fill soil to existing grade. Clean utility corridors would be delineated and if necessary excavated to a depth deeper than one-foot (with off-site disposal as described above) to accommodate utility installation requirements. Procedures required for soil management and dust and erosion control would be addressed in a Soil Management Plan (SMP) and Dust Control and Decontamination Plan (DCDP). Worker health and safety would be addressed in site safety plans (SSPs) prepared by the parties involved. If soil exceeding the remedial goal remains at the base of the backfilled excavations, institutional controls would be implemented for long term protection of human health and water quality. The evaluation of this alternative is summarized below.

Effectiveness

- Effectively protects human health by eliminating or significantly reducing potential exposure pathways.
- Short-term impacts associated with remediation would be reduced by provisions set forth in a SMP, DCDP and SSP.
- Long-term impacts would be addressed through implementation of institutional controls including land use covenant and operation and maintenance plan.
- Affords long-term protection of human health and the environment.
- Complies with ARARs.

Implementability

- Readily implemented; provided landfill disposal acceptance and source of clean fill material are secured.
- Technically feasible; however, site access and proximity of contaminated soil to Indian Creek would require careful handling and stringent use of BMPs.
- Administratively feasible; however, off-site disposal location of Class 2 waste will be dependent on waste characterization and landfill acceptance criteria.
- Likely acceptable to regulatory agencies but may not be acceptable to the local community due to visual and environmental impacts of high volume truck traffic. Based on preliminary volume estimates (10-acres surface area of potentially impacted soil excavated to one-foot depth), approximately 850 truckloads for off-haul and up to 850 truckloads for import of clean fill would be required. The staging area for trucks would be located in the northwestern portion of the Site. Trucks would leave the site via California State Highway 89 southbound, approximately 100 yards west of the site.
- Can be performed in a moderate time frame depending on excavation contractor and trucking availability and landfill acceptance criteria.

Cost

- High capital costs. Planning level cost estimates indicate that the direct cost of Excavation and Off-Site Disposal of impacted soil and placement of clean soil backfill would likely exceed $4,000,000. A cost estimate is provided in Table 6a. The cost estimate also includes a minus 30% and plus 50% contingency, which is primarily related to uncertainties regarding the volume estimate, off-site disposal fees and cost of imported fill soil. Additional costs would include construction management and erosion control BMPs.
- Relatively high indirect costs (estimated in excess of $400,000) associated with Excavation and Off-Site Disposal include verification soil sampling and analysis, landfill characterization sampling and analysis, construction management, institutional controls and reporting requirements. Engineering tasks such as the preparation of grading plans, a storm water pollution prevention plan (SWPPP), surveying and permitting fees that would be required as part of standard redevelopment activities are not included in the cost estimate provided in Table 6a.
- On-going costs associated with off-site disposal include potential contaminated soil left at depth including institutional controls, maintenance and monitoring.

The Excavation and Off-Site Disposal alternative would provide overall protection of human health and the environment, would reduce toxicity and mobility of contaminants, and would be in compliance with ARARs and would likely be acceptable to State and local regulatory agencies. However this alternative may not be acceptable to the local community due to the large volume of truck traffic required to off-haul contaminated soil and import fill to the Site. Furthermore, the total cost of Excavation and Off-Site Disposal alternative far exceeds the maximum budget available from potential grant sources such as EPA Brownfields Cleanup grants. SI does not anticipate other funds would be available

to complete this alternative. Therefore the Excavation and Off-Site Disposal alternative is not an acceptable remedial alternative.

ALTERNATIVE 3: ON-SITE COVER PLACEMENT WITH INSTITUTIONAL CONTROLS

Proposed remedial actions include capping of soil in areas where elevated contaminant concentrations exceed remedial goals. Clean fill material used to cover these areas is to comply with DTSC's advisory *Information Advisory Clean Imported Fill Material* (DTSC, 2001). In general, potential contaminant concentrations in imported or on-site sourced fill should be below RSLs and DTSC-SLs for industrial sites or the site specific background arsenic concentration.

The On-Site Cover Placement with Institutional Controls alternative includes the following tasks:

Placement of a minimum of one-foot of clean fill soil and or installation of a hard surface material such as asphalt or concrete over all potentially affected soil exceeding the remedial goal. Based on evaluation of soil sample results and the remedial goal, an estimated 10-acres of surface area in the northern portion of the Site would receive cover soil placement to create a barrier between impacted soil and redeveloped Site surface and to raise developed areas to reduce the potential for future flooding.

Excavation of wood waste stockpiles located in the eastern side of the northern portion of the Site is located within the 100 year flood plain as is much of the proposed fill area in this alternative. In order to reduce potential flood impacts, two wood waste stockpiles currently located along the eastern edge of the northern portion of the Site would be excavated from its current location and placed as fill in the southern portion of the Site. The wood waste would be relocated on top of the large existing stockpile in the southern portion of the Site at an elevation above the assumed 100-year flood plain. The volume of fill material placed within the flood plain would not exceed the volume of material removed from within the flood plain so that the total flood plain storage volume at the Site and surrounding areas is not reduced by the project. Figure 5 shows an assumed approximate 100 year flood elevation based on review of available FEMA Flood Insurance mapping, detailed site topographic mapping and current Site conditions. The assumed flood elevaton indicated on Figure 5 was not prepared by a licensed surveyor and should only be used for planning purposes.

The existing Site drainage system would be extended or modified and Site grades would be designed to maintain positive drainage to the east and south toward Indian Creek and maintain adequate drainage from areas to the west of the Site to Indian Creek.

Clean utility corridors would be delineated and, if necessary, excavated to a sufficient depth and backfilled with clean soil to accommodate future utility installation

requirements. Excavated material would be spread over surrounding fill areas before cover soil placement.

Erosion control measures would be implemented. Procedures required for soil management and dust and erosion control would be addressed in a SMP, DCDP, and SWPPP. Worker health and safety would be addressed by SSPs prepared by the parties involved. Future earthwork construction workers who would potentially contact impacted Site soil during implementation of this work would require Occupational Safety and Health Administration (OSHA) Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training.

A municipal water supply source will provide water for future Site use. If the municipal water supply source is not of sufficient capacity for future Site use and groundwater is needed as a water supply source for the Site, the SLHHRA will be updated at that time to evaluate additional complete exposure pathways to groundwater.

A Land Use Covenant (LUC) and Operation and Maintenance (O&M) agreement would likely be required. Upon completion of these tasks, the covered areas would be suitable for industrial re-use. The evaluation of this alternative is summarized below.

Effectiveness

- Covering of the impacted soil effectively reduces human health risk by eliminating potential exposure pathways (incidental ingestion, inhalation of airborne particulates, and dermal contact with the impacted soil) for future industrial workers.
- On-site containment and capping in place of soil exceeding the remedial goal would likely be acceptable to regulatory agencies and would be protective of groundwater.
- Delineation, excavation and backfilling of clean utility corridors would facilitate site development and be protective of future maintenance workers.
- Short-term impacts associated with remediation would be reduced by provisions set forth in a SMP, DCDP, SWPPP and SSPs prepared by the parties involved.
- The On-Site Cover Placement alternative would require an LUC and O&M agreement for the proposed in-place disposal areas, which would afford long-term protection of human health by restricting future disturbance.

Implementability

- Readily implemented.
- Labor, material and equipment readily available.
- Likely acceptable to regulatory agencies and community.

Cost

- Moderately high capital costs (approximately $1,250,000) associated with equipment mobilization and access, on-site sourced or imported fill; fill

placement, moisture-conditioning and compaction; quality assurance observation and testing and erosion control. A cost estimate is presented in Table 6b.
- Moderately high capital indirect costs (approximately $160,000) associated with construction management and institutional controls including development of an LUC and O&M agreement, and periodic reporting.

The On-Site Cover placement with institutional controls alternative would provide overall protection of human health and the environment, would reduce toxicity and mobility of contaminants, and would be in compliance with ARARs and would likely be acceptable to State and local regulatory agencies. However, the relatively high cost of remediating the entire Site in one phase of work may not be possible at this time due to the lack of sufficient available funding. A modified version of this alternative involving phased implementation of the cover placement alternative is considered in Alternative 4 outlined below.

ALTERNATIVE 4: PHASED IMPLEMENTATION OF ON-SITE COVER PLACEMENT WITH INSTITUTIONAL CONTROLS

The Phased Implementation alternative includes all elements of Alternative 3 but would be implemented in a phased approach as determined by the Site owner SI and partners based on cleanup and redevelopment funding availability. Clean fill soil from an on-site borrow source would be used to cover areas of the Site proposed for redevelopment in the manner as described in Alternative 3. During each phase of fill placement, a corresponding or greater volume of stockpiled wood waste located within the 100-year flood plain would be excavated and disposed of off-site or relocated within the site at an elevation above the assumed flood plain. Access to areas of the Site not yet subject to cleanup/redevelopment would be restricted by temporary chain link fencing and future earthwork construction workers who would potentially contact impacted Site soil during implementation of this work would require OSHA HAZWOPER training. Other institutional controls would be implemented in a phased approach that would include groundwater use restrictions unless these additional complete exposure pathways are evaluated in a revised SLHHRA. This alternative would also reduce potential exposure during the phased future use of the Site. A LUC would restrict future Site use to industrial use. An O&M agreement would be implemented to verify that cap (import fill or hardscape) over the placement areas remain intact. Worker health and safety would be addressed by SSPs prepared by the parties involved. Following implementation of these activities, the covered area would be suitable for industrial land use.

Effectiveness
- Effectively protects human health by eliminating the potential exposure pathways in areas scheduled for re-use for future industrial workers. Covering soil that exceeds remedial goal with clean soil or hardscape effectively reduces human health risk by eliminating potential exposure pathways (incidental ingestion, inhalation of airborne particulates, and dermal contact with the impacted soil).

- Delineation, excavation and backfilling of clean utility corridors would facilitate site development and be protective of future maintenance workers.
- Affords long-term protection of human health and the environment.
- Complies with ARARs.
- Short-term impacts associated with remediation would be reduced by provisions set forth in a SMP, DCDP, SWPPP and SSP prepared by the parties involved.
- The Phased Approach alternative requires an LUC and O&M agreement for the proposed placement and cover locations, which afford long-term protection of human health by restricting future disturbance in areas remediated and restricted access to areas not yet remediated.

Implementability

- Readily implemented.
- Labor, material and equipment readily available.
- Likely acceptable to regulatory agencies and community based on the reduction of significant human health risk in areas remediated and institutional controls including fencing to limit exposures in areas not yet remediated.

Cost

- Moderately high Phase 1 capital costs (approximately $700,000) associated with excavation of wood waste stockpiles and surface debris, AC and concrete removal and reprocessing, on-site fill soil excavation and fill placement. Minus - 30% and +50%% contingency costs are included in the cost estimate presented in Table 6c.
- Moderate indirect Phase 1 costs (approximately $90,000) associated with construction management and institutional controls.

Based on relatively affordable costs which could be implemented on a sliding scale based on availability of cleanup and redevelopment cleanup funding, relatively high levels of protection of human health in areas remediated and incremental improvements in protection of water quality, the Phased Approach is considered to be an acceptable remedial alternative for the Site. More specific discussion of the preferred alternative selection is provided below.

SELECTED REMEDIAL ALTERNATIVE

Four remedial alternatives were considered for the Site: Alternative 1 - No Action; Alternative 2 - Excavation and Off Site Disposal; Alternative 3 - On-Site Cover Placement; and Alternative 4 - Phased Implementation of On-Site Cover Placement.

Alternative 1 - No Action would not be protective of human health or the environment, and therefore is not an acceptable alternative.

Alternative 2 - Excavation and Off-Site Disposal of all excavated soil that exceeds the remedial goal would be cost prohibitive and thus is not an acceptable alternative. The

estimated cost of Alternative 2, likely exceeding $5,000,000 including indirect costs, exceeds potential Brownfields or other grant funding budgets for cleanup and implementation. Exceeding the available grant funded budget is unacceptable as it would result in project termination prior to completion. SI currently does not have sufficient funding available to complete the Excavation and Off-Site Disposal Alternative.

Alternative 3 - On-Site Cover Placement with Institutional Controls would provide suitable protection of human health, improve protection of water quality, would be consistent with ARARs and would likely be acceptable to State and local agencies but may not be possible at this time due to the relatively high cost of remediating the entire site during one phase of work which was estimated at approximately $1,800,000 including indirect costs.

Alternative 4 - Phased Implementation of Alternative 3, On-Site Cover Placement with Institutional Controls is the selected remedial alternative based on affordable costs generally consistent with available grant funding, relatively high levels of protection of human health and improvements in protection of water quality.

The scope of Alternative 4 includes a phased approach to Site remediation and redevelopment. Clean fill soil from an on-site borrow area will be placed over Phase 1 redevelopment areas where existing soil exceeds the remedial goal. This alternative also includes excavation of stockpiled wood waste or other soil or surface debris located on the Site in areas within the 100-year flood plain. The excavated material would be relocated to an area of the Site above the assumed 100 year flood elevation. The volume material relocated out of the flood plain will be greater than or equal to the volume of fill placed within the flood plain. The scope of Phase 1 including areas remediated could be adjusted to fit the available budget based on engineers cost estimates prepared with detailed grading plans.

Alternative 4 would provide for institutional controls, including fencing to restrict access to areas of the Site not yet remediated, signs informing Site occupants and the public of potential toxic chemical exposure risks, an operation and maintenance plan and an LUC stipulating that areas of soil cover would not be disturbed unless performed in accordance with the SMP. Land use would be restricted to industrial use.

PROPOSED REMEDIAL ACTION

Proposed remedial actions at the Site will be implemented as follows:

- Delineation of site borrow area and areas to be remediated, volumes of stockpiled wood waste and surface preparation rubble to be removed and processed or relocated within the Site, as completed and as shown on Figure 5.

- Clearing and grubbing and excavation of wood waste stockpiles in the eastern side of the northern portion of the Site to be relocated to the southern portion of the Site outside the 100-year flood plain (Figure 5).

- Surface preparation of borrow area and fill placement areas including excavation of relic asphalt and concrete surface material, moisture conditioning and compaction of subsoil (Figure 5). Excavated concrete and asphalt will be crushed and used as fill in areas not proposed for redevelopment by structures or roadways.

- Placement of a minimum of one-foot of clean compacted on-site sourced or imported fill soil or hardscape such as asphalt of concrete over areas proposed for redevelopment where existing soil exceeds the remedial goal (Figure 5). Imported fill soil (if any is used) must comply with DTSC's "Clean Fill Advisory' (DTSC, 2001).

- Installation of temporary fencing and signage to restrict access to areas of the Site where remediation has not yet been completed or where soil remains at concentrations above cleanup goals.

- Post -Construction Phase - Institutional Controls including land use covenant and O&M agreement.

Volume Estimates for Proposed Remedial Action:

Assuming Phase 1 of the remediation will involve an approximate surface area of approximately 5 acres or 217,800 square feet of structural fill placement, 1.5 acres of non-structural fill placement and 1.5 acres of asphalt repair and maintenance, the following volume estimates include total volumes included in the proposed remedial action:

On-site fill soil excavation and placement:	12,800 cy
Reprocessed AC/Concrete rubble placement	800 cy
Relocated wood waste stockpiles	11,500 cy

Figure 5 is a Proposed Phase 1 Work Areas Map showing approximate areas of proposed Phase 1 cover soil fill placement, AC/Concrete fill placement and wood waste relocation. Figure 6 shows Proposed Phase 1 Completed Surface Conditions.

REMEDIAL PROCEDURES AND IMPLEMENTATION

The Site remediation will be performed in a phased approach as outlined above. The tasks required for Site remediation and project implementation include:

- Equipment mobilization, staging and site access
- Water pollution control and BMPs
- Clearing and grubbing
- Wood waste stockpile relocation
- Preparation of fill placement areas for backfill

- Clean utility corridor excavation and backfill
- On-site fill soil excavation and placement in structural fill areas
- Processed concrete fill placement in non-structural fill areas
- Asphalt Repair and Maintenance
- Drainage modifications and erosion control
- Re-vegetation in borrow area and vegetated buffers
- Install temporary fencing
- Construction management
- Institutional controls

Specific discussion of these tasks is provided below.

EQUIPMENT MOBILIZATION, STAGING AND SITE ACCESS

The proposed remedial measures will require use of heavy equipment, which can access the Site from Highway 89 through the gated site entry along the northwestern edge of the Site. Staging areas will be in the northwestern portion of the Site to the northeast of the Site entrance.

WATER POLLUTION CONTROL BMPS

BMPs outlined in a Grading Plan and SWPPP will be implemented to control surface erosion and protect water quality during project implementation. BMPs will be required around the perimeter of all proposed excavation, grading and soil placement areas and stockpiles. BMPs will include installation and maintenance of, fiber rolls, dust control, stockpile management and other applicable BMPs as necessary.

In accordance with the requirements of the National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity, Water Quality Order 2009-0009-DWQ amended by 2010-0014-DWQ and 2012-006-DWQ (General Permit) issued by the State Water Resources Control Board (SWRCB), the Contractor will submit to the SWRCB the appropriate Permit Registration Documents (PRD) such as (1) a notice of intent (NOI) to obtain coverage under the General Permit, and (2) a SWPPP. The SWPPP will be prepared by a Qualified SWPPP Developer (QSD) and implemented by a Qualified SWPPP Practitioner (QSP).

CLEARING AND GRUBBING

Areas where the proposed activities include excavation, grading, or cover soil placement, will be cleared of any vegetation including roots, asphalt or concrete, and moisture conditioned prior to grading. All roots and adhered soil will be transported to the southern area of the site and stockpiled on top of the existing wood waste fill stockpile (DU-21). Woody debris will be chipped and the chips stockpiled on-site for use as mulch. Concrete and asphalt debris will be temporarily stockpiled on site and

processed by crushing and metal debris removal and reused as fill on the site. The Dust Control and Decontamination Plan (DCDP) included in Appendix F will be implemented to minimize air quality impacts.

PREPARATION OF SOIL PLACEMENT AREAS FOR BACKFILL

Prior to placement of fill, the designated fill placement areas will be graded using a bull dozer or grader to level the area as recommended by the project engineer. Prior to fill placement, placement areas will be moisture conditioned and compacted to at least 90 percent of the maximum dry density per ASTM D1557.

CLEAN UTILITY CORRIDORS

Designated clean utility corridors will be delineated on the grading plan prepared by the project engineer to facilitate proposed and future development and to protect future maintenance workers. Utility corridors will be excavated to the maximum width and depth anticipated for future development (approximately 2 feet wide and 3 feet deep) and backfilled with clean imported fill or bedding sand. Excavation spoils will be spread in the fill placement area and compacted prior to placement of clean fill by the procedures described below. Clean utility corridors will be delineated with a subsurface marker fabric and surveyed to facilitate future development.

ON-SITE FILL SOIL EXCAVATION AND PLACEMENT

Clean imported fill and/or soil below the remedial goal excavated from the on-site borrow area will be placed as fill in the designated cover soil placement areas including all proposed Phase 1 redevelopment areas over soil exceeding the remedial goal for arsenic (Area 1 on Figure 5). Imported fill (if any) will be tested in accordance with DTSC's October 2001 report, *Information Advisory, Clean Imported Fill Material.* Fill from the on-site borrow area has been characterized and identified as acceptable clean fill as documented in SSI's November 2018 report, *Results of On-site Fill Investigation for Crescent Mills Industrial Site* (Appendix C). Fill will be placed in maximum 6-inch loose lifts to achieve a soil cover with a minimum compacted thickness of 12-inches in accordance with the engineers recommendations. Based on Phase 1 volume estimates included in this report, it is anticipated that the fill placement will cover a surface area of approximately 5-acres (217,800 sf) and will be placed to a minimum depth of one foot (approximately 8,100 cy fill volume). As directed by the project engineer, the placement areas will be gently sloped to maintain positive drainage toward the east and south toward Indian Creek and to allow areas to the west of the Site to drain to Indian Creek. Proposed Work Areas, including excavation and fill placement areas, are shown on Figure 5. The Soil Management Plan (Appendix G) will address soil handling operations during remediation activites and after redevelopment if subsurface activities disturb the cap. A detailed Grading and Drainage Plan prepared by the project engineer (NST Engineering, 2019) is presented in Appendix K.

AC REPAIR AND MAINTENANCE

Existing asphalt and concrete slabs in Fill Area 2 and Area 3 (Figure 5) will be evaluated and repaired, or replaced to seal cracks or fill gaps, and maintained so that a continuous hard surface is sustained which will prevent site occupant's exposure to underlying soil. Institutional controls will be implemented such that any future subsurface work conducted in Areas 2 and 3 below the hardscape and in native soil will be performed by construction workers following HAZWOPER training protocols.

PROCESSED CONCRETE FILL PLACEMENT

Processed concrete and AC fill and or soil excavated from the on-site borrow area will be placed as fill over all exposed soil in the Area 3 fill placement area where no structural development is proposed during Phase 1 cleanup. Fill will be placed in maximum 6-inch loose lifts to achieve a soil cover with a minimum compacted thickness of 6-inches in accordance with the engineers recommendations. Based on Phase 1 volume estimates included in this report, it is anticipated that the fill placement will cover a surface area of approximately 1-acre (43,000 sf) and will be placed to a minimum depth of 6-inches (approximately 800 cy fill volume). Processed concrete fill placement areas will be surfaced with a "chip seal" asphalt emulsion to prevent airborne dust. Figure 5 shows the Area 2 and 3 fill placement areas. A Grading and Drainage Plan prepared by the project engineer is included as Appendix K.

DRAINAGE MODIFICATIONS AND EROSION CONTROL

The existing storm drainage system will be protected in place during site preparation and fill placement. At the completion of fill placement, storm drain inlets will be extended to match final grade. Additional drainage modifications may be implemented at the direction of the project engineer. The on-site borrow area will be contoured and loosely compacted to facilitate positive site drainage and revegetation. Erosion control measures including installation of straw wattles down slope of all excavation and fill placement areas, and surrounding stockpiles will be maintained during and prior to site remediation in accordance with the SWPPP.

RE-VEGETATION

The on-site borrow area and all areas of exposed soil disturbed during site grading (excluding compacted fill placement areas) will be treated with a hydroseed application utilizing California Native Species seed. Additional container planting will be performed at the direction of a qualified horticulturist.

TEMPORARY FENCING

After completion of Phase 1 site remediation activities, temporary fencing, consisting of 6-foot chain link fencing will be placed and maintained around completed remedial areas to restrict access to areas of the Site where contaminated surface soil is known or suspected to remain in place. The relocated stockpiles will also be located within this temporary fenced area (Figure 5)

CONSTRUCTION MANAGEMENT

An OSHA-HAZWOPPER certified remediation contractor will be retained to perform the tasks described above. OSHA-HAZWOPPER trained SSI employees or other construction management personnel will monitor field activities, perform environmental monitoring, and address contractor requests for information. A Site Safety Plan (SSP) included in Appendix H and discussed below, will address health and safety issues for SSI employees. Contractors will be responsible for their employees' health and safety.

INSTITUTIONAL CONTROLS

At the completion of each phase of remediation, temporary or permanent fences will be installed to separate remediated areas in the northern portion of the Site from areas of the site with documented or suspected contamination requiring future remediation. Signs will be placed on gated entrances to the not yet remediated areas to inform Site workers or the public that surface soil with elevated concentrations of potential site contaminants may be present on the Site. EPA will be consulted regarding sign language. To provide additional human health protection, Land Use Covenants (LUCs) will be established for areas of the site where elevated concentrations of PCOCs will remain in place under proposed soil or hard surface cover. Future land use will be restricted to industrial or open space use. An O&M agreement may be required which would include yearly monitoring and reporting of the integrity of the fill and signage.

LAND USE COVENANT AGREEMENT FOR ON-SITE PLACEMENT AREA

An LUC agreement and O&M agreement are recommended for all areas where impacted soil is to be left in place beneath cover soil or hard surface. LUC agreements are intended to protect public health and the environment by: 1) preventing inappropriate land use, 2) increasing the probability that the public will have information about residual contamination, 3) disclosing information for real estate transactions about residual contamination, 4) ensuring that long-term mitigation measures are carried out by protecting the engineering controls and remedy; and 5) ensuring that subsequent owners assume responsibility for preventing exposure to contamination.

DEED RESTRICTION

After completion of Site remediation a deed restriction will likely be required by Plumas County to define acceptable future Site use. SSI anticipates that details of a deed

restriction will be negotiated between the property owner and Plumas County Environmental Health Department based on the outcome of the site cleanup.

OPERATIONS AND MAINTENANCE AGREEMENT

An O&M agreement will be adopted from the Hazardous Waste Control Law, as set forth in CCR Title 22, including Sections 66264.147, 66265.143, 66265.145 and 66265.147. The O&M Agreement is to be discussed with Plumas County Environmental Health Department after the completion of the site cleanup activities.

SITE SAFETY PLAN

SSI prepared a Site Safety Plan for use of construction management personnel at the site. The SSP provides information regarding potential chemical and physical hazards that may exist at the site and describes safety measures to be followed by field personnel during remedial activities. The SSP conforms to requirements of Hazardous Waste Operations and Emergency Response, Title 8 CCR, Section 5192 and Title 8 CCR, Section 5155. Appendix H presents the SSP. A Hospital Route Map is included.

Remediation contractors and subcontractors selected to perform work associated with the remediation are responsible for their own health and safety and will be required to prepare an SSP for their activities. At a minimum, contractors and subcontractors are to adhere to the requirements and safety measures in the SSP prepared by SSI. SSI is not responsible for the safety of contractors and site visitors.
All personnel working at the Site shall have completed 40 hours of comprehensive health and safety training, which meets the requirements of 29 CFR 1910.120.

DUST CONTROL AND DECONTAMINATION PLAN

During the remedial activities, soil moisture content is to be maintained to reduce the potential for dust generation and the need for respiratory protection. Details are provided in the DCDP (Appendix F) and SSP (Appendix H). The DCDP also includes perimeter air monitoring during designated phases of remedial work.

PUBLIC PARTICIPATION

Sierra Institute (SI) prepared a Community Profile for the project vicinity. SI will work with Plumas County Environmental Health Department to conduct the appropriate and necessary public participation activities prior to and during the proposed remedial action. A copy of the Draft RAW will be available for public review during a 30 day public comment period. All comments will be addressed in a Response to Comments Memo. The Final RAW will incorporate public comments as warranted. Appendix I is a copy of the Community Profile Report prepared by SI for the project.

REMEDIAL ACTION REPORTING

The results of the remedial activities will be presented in a post-remediation report to be prepared after each phase of Site remediation. The purpose of that report is to describe remedial activities and to document compliance with this RAW. The report will present:

- Summary of remedial activities performed;
- Description and basis for deviations, if any, from this RAW;
- Limits of soil placement areas, stockpiles and other cover materials
- As-built drawings of the on-site placement area;
- Summary of construction quality assurance performed during placement and compaction of soil cover; and
- Summary of Site restoration activities and institutional controls.

The post-remediation report will be presented to EPA and Plumas County Environmental Health Department for review.

ADMINISTRATIVE RECORD LIST

An Administrative Record List documenting previous site reports, grant agreements and other documents pertaining to the project is included in Appendix J

LIMITATIONS

The following limitations apply to the findings, conclusions and recommendations presented in this plan:

SSI's professional services were performed consistent with the generally accepted engineering principles and practices employed in northern California. No warranty is expressed or implied.

These services were performed per SSI's agreement with SSI's client. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of our services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan. This plan is solely for the use of our client unless noted otherwise. Any reliance on this plan by a third party is at the party's sole risk.

If changes are made to the nature or design of the project as described in this plan, then the conclusions and recommendations presented in this plan should be considered invalid by all parties. Only SSI can determine the validity of the conclusions and recommendations presented in this plan. Therefore, SSI should be retained to review all project changes and prepare written responses with regards to their impacts on SSI's conclusions and recommendations. However, SSI may require additional field work and laboratory testing to develop any modifications to the plan. Costs to review project changes and perform additional fieldwork and laboratory testing necessary to modify SSI's recommendations are beyond the scope of services presented in this plan. Additional work will require an approved scope of services, budget, and authorization to proceed.

SSI is not responsible for the health and safety of non-SSI personnel, on or off the project site.

The analyses, conclusions and recommendations presented in this plan are based on site conditions as they existed at the time SSI's investigations were performed. Changes in the conditions of the property can occur with the passage of time. The changes may be due to natural processes or to the works of man, on the project site or adjacent properties. In addition, changes in applicable or appropriate standards can occur, whether they result from legislation or the broadening of knowledge. Therefore, the recommendations presented in this plan may need to be revised based on site conditions or regulatory requirements.

REFERENCES

California Environmental Protection Agency, Department of Toxic Substances Control (October 2001) Information Advisory, Clean Imported Fill Material.

California Environmental Protection Agency, Regional Water Quality Control Board (June 1989). The Designated Level Methodology.

California Environmental Protection Agency, Regional Water Quality Control Board (September 15, 1998). Fourth Edition of the Water Quality Control Plan for the Sacramento and San Joaquin River Basins.

California Environmental Protection Agency, Regional Water Quality Control Board (August 2003). A Compilation of Water Quality Goals.

California Environmental Protection Agency, State Water Resources Control Board (October 28, 1968). Resolution No. 68-16, Policy with Respect to Maintaining Higher Quality Waters in California.

CH2M HILL, Inc., 1991. Property Transfer Environmental Site Assessment, Prepared for Louisiana-Pacific Corporation, Samoa, California. May.

Ecology and Environment (E&E), 2014a. Phase 1 Environmental Site Assessment for Former Louisiana Pacific Lumber Mill, Prepared for USEPA Region 9 and The Sierra Institute for Community and Environment. July.

Resna, *Assessment of Soil and Groundwater Contamination, Sacramento Valley Moulding Facility*, (1992)

Sierra Streams Institute, 2018a. Results of On-site Fill Investigation for Crescent Mills Industrial Site, (December 2018)

Sierra Streams Institute, 2018b. Additional Site Characterization Results for the Southern Portion of Crescent Mills Industrial Site, February.

United States Department of Agriculture Soil Conservation Service and Forest Service, Soil Survey of Plumas County Area, California.

United States Environmental Protection Agency (U.S. EPA, 2018), Regional Screening Levels, November 2018.

United States Geological Survey (2012). Crescent Mills Quadrangle California, 7.5 Minute Series Topographic Map.

United States Geologic Survey (1908). Geology of the Taylorsville Region, Bulletin 353.