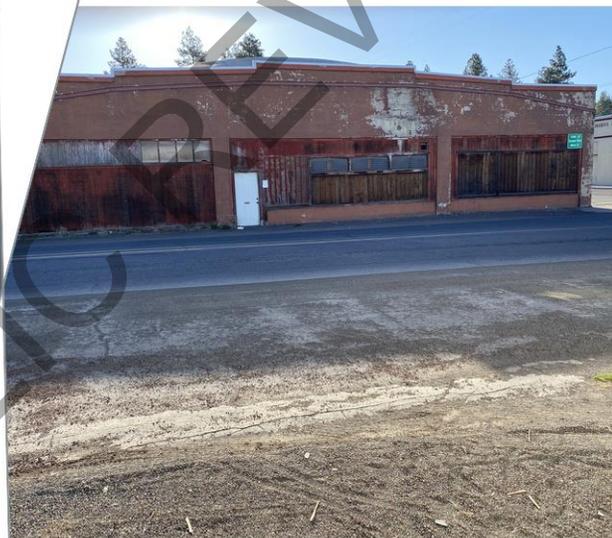


DRAFT Analysis of Brownfield Cleanup Alternatives Report

Former Markwardt Brothers Garage
North 1st Avenue and West Chocktoot Street
Chiloquin, Klamath County, Oregon 97624

Prepared for: City of City of Chiloquin
USEPA Cooperative Agreement: BF-02J00701-0

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1 Introduction

This Analysis of Brownfield Cleanup Alternatives (ABCA) has been prepared by Cardno, Inc. (Cardno), on behalf of the City of Chiloquin (City) for the former Markwardt Brothers Garage property, located northeast of the North 1st Avenue and West Chocktoot Street intersection in Chiloquin, Klamath County, Oregon (**Figure 1**), herein referred to as the “Subject Property” or “Site.”

The City received a U.S. Environmental Protection Agency (EPA) FY2021 Brownfields Assessment Grant (No. BF-02J00701-0). In addition, the Subject Property was entered into the Voluntary Letter Agreement (ECSI No. 6462) with the Oregon Department of Environmental Quality (ODEQ) on June 4, 2021.

During 2021, Cardno completed a Phase I Environmental Site Assessment (ESA), Asbestos and Lead-Based Paint Survey, and Phase II ESA. The information obtained during these assessments guided site activities with respect to potential environmental impairment and liabilities on the Site resulting from hazardous building materials, abandoned underground storage tanks, and petroleum-impact to the subsurface.

To facilitate the environmental corrective action at the Subject Property, the City is applying for an EPA FY2022 Brownfield Cleanup Grant. This ABCA has been prepared using the City’s FY2021 Assessment Grant funds to demonstrate to the EPA that appropriate cleanup methods have been evaluated and will be applied during cleanup activities, as required by the grant. In addition to meeting EPA requirements for an ABCA, this document is also designed to meet the requirements for any:

- Asbestos sampling or abatement under EPA regulations and Oregon Administrative Rules (OAR) 340-248
- Lead-based paint sampling or abatement under Oregon Revised Statutes (ORS) 431A.350 through 431A.363; and OAR 333-069 and 333-070
- Petroleum underground storage tank assessment and/or decommissioning under OAR 240-122 (leaking underground storage tank program) and 340-150 (underground storage tank program)
- ODEQ Environmental Cleanup Program, Voluntary Cleanup Pathway, ORS Title 36A Chapter 465

The purpose of this cleanup action is to prepare the site for future redevelopment and to prepare for a FY2022 EPA Brownfield Cleanup Grant, while protecting human health and the environment. Public notice has been given in accordance with the requirements of the Cleanup Grant application process and this document will be available for public review and comment prior to implementation.

This ABCA provides information on the following:

ABCA Requirements

- Information about the site and contamination issues (e.g., exposure pathways, identification of contaminant sources, etc.), cleanup standards, applicable laws, alternatives considered, and the proposed remediation approach.

- An analysis of reasonable remedial alternatives, including no action.
- A discussion of the effectiveness, implementability, and cost of the cleanup methods considered.

This ABCA will address the hazardous building material impacts, USTs, in-ground hydraulic lifts, historical automotive repair, and resulting potential for hazardous substance and petroleum impact to the Subject Property subsurface.

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2 Background

2.1 Site Description

The Subject Property is comprised of two tax parcels (Parcel ID 3407-034DC-00400 & Parcel ID 3407-034DC-00500), currently owned by the Klamath County, located at the center of downtown Chiloquin, Oregon. The Site is bound by a commercial facility to the north, undeveloped/vacant land to the northeast, multi-commercial facility to the east, Sky Lakes Wilderness Adventures and Klamath Tribal Courts & Child Support Enforcement Office to the southeast, the Hirvi building to the south, a former gas station to the west, and the former Union Oil Bulk Plant property to the northwest.

According to the Klamath County Tax Assessor's website, the Site encompasses two parcels totaling approximately 0.55-acres. The Subject Property is developed with a single-story former automotive service garage of concrete block and brick facade construction. A second building, formerly occupied by the Chiloquin Mercantile, was located on the north parcel; however, the building partially collapsed and was subsequently demolished in-place with the exception of a vault. The associated rubble remains on-site. The building is currently vacant and in the care of Klamath County.

The Site location is depicted on the Chiloquin, Oregon Topographic Quadrangle of the US Geological Survey (USGS) 7.5-minute series map as shown in **Figure 1**. A site boundary and tax parcel map is included as **Figure 2**.

2.2 Site History

According to the current property owner, the on-Site commercial structure was constructed in the 1940s. The building was previously supported a car dealership, grocery, bicycle repair shop, music school, and auto-body shop.

2.3 Environmental Impacts

While this report provides an overview of potential environmental concerns, both past and present, the environmental assessment is limited by the availability of information at the time of the assessment. It is possible that unreported disposal of waste or illegal activities impairing the environmental status of the Site may have occurred that could not reasonably be identified.

The conclusions regarding environmental conditions that are presented in this report are based on a scope of work authorized by the Client. Please note that virtually no scope of work, no matter how exhaustive, can identify all contaminants or all conditions both above and below ground. Cardno also assumes that the Client and other interested parties will read this report in its entirety.

3 Regional Setting and Site Characterization

3.1 Topographic and Physiographic Setting

The Site situated in the generally flat area of alluvial deposits along the Williamson River. According to the US Geological Survey, Chiloquin Quadrangle, the Site rests at approximately 4,200 feet (North American Vertical Datum of 1988, located along the boundary of the Cascade Range and Basin and Range geologic regions of southern Oregon. The Basin and Range region extends to the east, characterized by arid tablelands, intermontane basins, dissected lava plains and scatter low mountains (<http://greatbasin.wr.usgs.gov/default.aspx>). The topography transitions moving west to the peaks and eroded valleys consistent with the High Cascade Range.

3.2 Site Hydrogeology

Surface water flow from the Site generally flows to the west toward the Williamson River, located approximately 800 feet west of the Site. Lithology descriptions from the Site indicate that the shallow subsurface is generally comprised unconsolidated sand and silt deposits. Generally, these deposits were represented by sandy silt, with less common observances of gravel and clay. Groundwater flow direction at the Site is presumed to the west or southwest towards the Williamson River.

4 Previous Assessment Activities

Summaries of known environmental reports and investigations relative to the Site are included below. Excerpts of selected reports are included as **Appendix A**.

4.1 Phase I ESA and Asbestos & Lead-based Paint Survey – Former Markwardt Brothers Garage – Cardno, Inc. – May 2021

Cardno completed a Phase I ESA and Asbestos and Lead-Based Paint Assessment on the Subject Property dated May 17, 2021. Through the review of historical records, interviews, and site reconnaissance, this assessment identified several RECs in connection with the Subject Property, including the following:

On-Site REC

1. According to the 1931 Sanborn Fire Insurance Map (FIM), the building was used as an auto repair garage (east portion), and “Gas & Oil” facility (southwest area). During site reconnaissance, Cardno personnel identified a potential underground storage tank (UST) vent pipe attached to the west interior wall of the on-site building in an area consistent with the FIM gasoline station location. Therefore, there is potential for historical bulk storage and dispensing of petroleum products on the Subject Property, which may have impacted the soil, groundwater, and/or vapor at the Subject Property.
2. The remains of three in-ground hydraulic lifts and one oil-changing pit were observed in the building. According to the 1931 Sanborn FIM, the on-site building is labeled as being an auto repair/garage facility. Additionally, based on the age of the building, this time-frame predates the regulation of the storage/disposal of hazardous substances such as used oil and other non-regulated automobile chemicals. Based on the age and duration of use, the in-ground lifts and unknown chemical management and disposal practices associated with historic operations, site soil, groundwater, and/or vapor may have been impacted by historic site operations.
3. During site reconnaissance, Cardno identified a second potential vent pipe in the interior of the building along the eastern wall. This feature is an indication of a second petroleum product UST and/or heating oil tank to exist on the Subject Property. Based on the age and duration of the former use of the building, there is potential for a UST/heating oil tank on the property that may have impacted the soil, groundwater, and/or vapor at the Subject Property.

Off-Site RECs

4. According to the 1931 Sanborn FIM, a Printing facility is located approximately 80 feet to the east. The length of operation for this facility is unknown. There is potential for a release from this facility.
5. According to the 1931 Sanborn FIM, a Cleaning facility is located approximately 120 feet to the southeast. The length of operation for this facility is unknown. There is a potential for a historic release from this facility.

Off-site HRECs

1. According to ODEQ records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989 which predates UST registration. These tanks were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. The new tanks were subsequently removed in 2017. Post-excavation confirmation sampling conducted in 2017 and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low. On July 22, 2019, ODEQ granted an NFA determination letter for the Chiloquin Texaco site. Based on the issuance of an NFA, and given the assumed ground water flow direction away from the subject site, this facility is considered a historical REC. See Section 5.1 for further details.

Asbestos-Containing Materials

An Asbestos containing materials (ACMs) survey was conducted during the Phase I ESA, and the following ACMs were identified throughout the interior of the building including:

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-Site building.
- Interior white texture and joint compound on drywall, totaling approximately 1,000 SF, located within the western most portions of the on-Site building.
- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

Overall, given the state of the buildings, most of these materials were in good to fair condition. Therefore, the identified ACM has a low probability of disturbance during ordinary use. Prior to any renovation or demolition that may cause the ACM to become friable, the material should be removed or abated by a qualified asbestos abatement contractor.

During the inspection, suspect building materials were observed in the exterior building debris from the former attached north building (former Chiloquin Mercantile); however, this material was not sampled and was identified in the report as presumed asbestos containing materials (PACM).

Lead-Based Paint

During the Phase I ESA inspection Cardno conducted a Lead-based paint (LBP) survey. Samples collected during the inspection identified LBP on various painted surfaces throughout the interior and exterior of the building in various tenant spaces including:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.
- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

Most of the identified painted surfaces were in poor condition, with peeling and deterioration noted. As the building is not considered to be child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition.

An excerpt of the Phase I ESA is included in **Appendix A**.

4.2 Phase II ESA – Cardno, Inc. – October 2021

Based upon the recommendations of Cardno's May 2021 Phase I ESA, a Phase II ESA investigation and asbestos sampling of the debris pile were conducted on the Subject Property in August 2021. The Phase II ESA consisted of advancing nine soil borings via direct push technology (DPT) drilling, and the installation of five temporary groundwater monitoring wells. During the Phase II ESA activities, Cardno's Ashton Smithwick, a licensed and accredited asbestos inspector, collected six (6) bulk samples from the debris/rubble pile for asbestos analysis by polarized light microscopy.

Soil samples were collected around former USTs, automotive repair bays, and areas suspected of impact from off-site RECs. **Petroleum** impact was reported in soil samples collected around former automotive repair bays and adjacent to the debris pile at concentrations below RBCs. **Lead** concentrations were reported in four soil samples exceeding the residential and occupational leaching to groundwater RBC; however, lead concentrations were reported below laboratory method detection limits in four of five groundwater samples analyzed from the Subject Property. The remaining groundwater sample, TMW-3, reported lead at a concentration of 26.7 parts per billion, well below applicable RBCs.

Groundwater samples were collected and analyzed for RCRA metals, VOCs, SVOCs, total petroleum hydrocarbons, and PCBs. Laboratory analysis reported concentrations well below all applicable residential and occupational RBCs. Those reported above laboratory method detection limits consisted of metals (**barium, chromium, and lead**) and **gasoline-range total petroleum hydrocarbons**.

Groundwater was observed across the Site at approximately 10 feet bgs.

Based on Cardno's findings from the May 2021 Phase I ESA, the former Markwardt Brothers Garage building was used as an auto repair garage and gasoline filling station. Further, Cardno personnel identified potential UST vent pipes attached to the west interior wall in the vicinity of the area historically used as a gasoline filling station as well as a second vent pipe in the eastern area of the building which potentially serviced a heating oil tank.

While on-Site during August 2021, Cardno subcontracted GPR Data Inc. (GPR Data) to conduct ground penetrating radar (GPR) study in around the potential UST vent pipes attached to the west interior wall in the vicinity of the area historically used as a gasoline filling station as well as a second vent pipe in the eastern area of the building which potentially serviced a heating oil tank. GPR field investigation began with the utilization of a Geophysical Survey Systems Inc. (GSSI) Utility Scan LT GPR system, configured with a 400-Megahertz (MHz) GPR antenna connected to a SIR3000. Upon completion, GPR Data identified one anomaly, appearing to represent patterns, data, and information comparable to a UST in the interior of the building. No other anomalies or evidence of additional USTs were noted.

Due to the potential for on-Site UST(s), lifts, and oil-change pit to contain remnant petroleum products, Cardno recommends the following actions to both facilitate redevelopment/reuse efforts on the Site and to protect future construction or excavation workers if these features are inadvertently encountered, or for future Site occupants in the event they result in a future release to the Site subsurface:

- Based on the GPR report provided by GPR Data, the area of the potential UST anomaly should be further investigated. If a UST is discovered, said UST should be decommissioned and reported in accordance with ODEQ guidelines;
- The potential for an additional heating oil UST in the Subject Property's east area (building interior east wall) should be further evaluated by installing a test pit/exploratory excavation, and if confirmed, the UST should be decommissioned in accordance with ODEQ guidelines;
- The in-ground hydraulic lifts and oil-change pit should be decommissioned by removal;
- Any concrete or soil removed from the Site should be characterized and directed to an appropriately permitted landfill for disposal;
- The debris/rubble pile should be characterized as regulated asbestos waste, and should be removed from the Site by a qualified asbestos abatement contractor in compliance with federal, state, and local regulations.

The soil borings are depicted on **Figure 3**. The groundwater monitoring wells are depicted in **Figure 4**.

5 Exposure Analysis

Preparation of an ABCA requires an evaluation be made as to the possible corrective actions and their respective costs to remedy effected areas. Not all remedies are physical or chemical and may include other types of remedies such as institutional controls (e.g. restriction on residential development recorded on the deed). Excess public risk requires four factors, all of which must be present to produce excess risk from contaminants at the site. These are:

- A chemical with sufficient toxicity to do harm (whether acute or chronic);
- A sufficient quantity of the chemical to be toxic and do harm;
- A receptor on which to do harm; and
- A pathway by which a sufficient amount of the contaminant can actually reach a receptor and do harm.

Corrective actions to remedy affected areas rarely eliminate all chemicals of concern or hazardous building materials. It is generally the intent to remove/abate, treat or immobilize/encapsulate impacted media or hazardous building materials to levels producing an acceptable risk to human health and the environment. The degree of acceptable risk has to be determined by the public through legislative and regulatory processes. This has been accomplished by the development and implementation of rules at the federal, state, and local levels.

5.1 Beneficial Land and Water Use

5.1.1 Locality of the Facility

As defined by ODEQ, the Locality of the Facility is “any point where a human or an ecological receptor contacts or is reasonably likely to come into contact with facility related hazardous substances.” (ODEQ, 1998a) This definition takes into account the likelihood of contamination migrating over time onto adjacent or nearby properties.

The chemical data obtained from soil and groundwater samples collected from the Site are used to approximate the Locality of the Facility, which is estimated to include the subsurface soil, groundwater, and soil vapor at the Site as well as the groundwater on adjoining properties directly downgradient of the Site.

5.1.2 Land Use Determination

The land use determination was performed in accordance with the ODEQ Guidance for the Consideration of Land Use in Environmental Remedial Actions (ODEQ, 1998a). The current and possible future land uses and water uses at the Site determine the types of receptors (human and ecological) that could potentially come into contact with elevated concentrations of impacted environmental media (soil, groundwater, soil vapor, hazardous building materials).

The Site is zoned for commercial use (C) by Klamath County. All adjoining properties are similarly zoned as commercial by Klamath County.

Potential future occupants of the Site and Locality of the Facility may be commercial or residential depending on developer preference and appropriate land use categories. Potential

current and future receptors in the Locality of the Facility include occupational and residential, as well as excavation and construction workers during potential remedial actions followed by land development and infrastructure construction. However, a residential occupancy of the Site is unlikely as the commercial zoning does not allow for residential occupancy under current zoning ordinances.

5.1.3 Groundwater Use

The beneficial water use determination was performed in accordance with ODEQ Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites (ODEQ, 1998b). A search of the Oregon Water Resources Department (OWRD) database and a driving reconnaissance of the area surrounding the Site did not identify any active drinking water supply wells on the Site or in the vicinity of the Site.

5.1.4 Surface Water

The nearest surface water body in proximity to the Site is the Williamson River, located approximately 0.15-mile to the west. A review of the US Fish and Wildlife Service's National Wetland Inventory and Site reconnaissance did not discover the presence of on-Site surface waters or wetlands.

5.1.5 Beneficial Water Use Determination

The municipal water system supplies the Site and surrounding area with drinking water; further, there are no wetlands or surface water bodies in the Locality of the Facility. Based on these findings, beneficial uses of groundwater within the presumed Locality of the Facility and unconfined aquifer are unlikely.

5.2 Exposure Pathways

In order for possible contaminants of concern (asbestos, LBP, petroleum products, and/or hazardous substances) to do harm to public health or the environment, they must occupy a point of exposure accessible to the population at risk. Compounds to which populations are not currently, nor in the future likely to be exposed via complete exposure pathways do not constitute a probable condition of elevated risk.

Based on the Site's zoning designation, absence of beneficial groundwater use within the Locality of the Facility, and intended commercial reuse concepts, the four potential receptor populations evaluated are anticipated to be:

- City of Chiloquin employees who access the Site;
- Residents – persons who reside near or trespass onto the Site;
- Construction workers during the potential redevelopment; and
- Future patrons of the end use development.

For each of the potential receptors being considered, the applicable exposure pathway of concern is direct contact with soil, groundwater, vapor, or hazardous building materials via incidental ingestion, dermal contact, and/or inhalation of particulates and/or vapor.

5.2.1 Soil

Laboratory analytical results of soil samples collected from the Site reported concentrations of diesel-, gasoline- and oil-range petroleum hydrocarbons; volatile organic compounds; and

RCRA-8 metal constituents. However, all concentrations of regulated chemical constituents are below ODEQ Risk-Based Concentrations (RBCs) for direct contact.

Lead concentrations in select soil samples from the Site exceed the leaching to groundwater RBC, the leaching to groundwater pathway is incomplete on the Subject Property and Locality of the Facility based on the empirical groundwater data from the Site and the availability of municipal drinking water to the Subject Property and surrounding area.

5.2.2 Groundwater

Laboratory analysis of groundwater samples collected from the Site to date did not exhibit concentrations of analyzed constituents above direct contact or groundwater in excavation RBCs. In combination with the absence of beneficial groundwater use in the Locality of the Facility, the groundwater pathway is considered incomplete.

5.2.3 Vapor

Laboratory analysis of soil and groundwater samples collected from the Site to date did not exhibit concentrations of analyzed constituents above volatilization to outdoor or vapor intrusion into building RBCs. Therefore the potential for inhalation of volatilized contaminants present in the soil or groundwater is considered incomplete.

5.2.4 Hazardous Building Materials/Components

Based on assessment activities conducted to date, there are ACM and LBP present in the building and debris pile; and there are USTs, in-ground hydraulic lifts, and an oil-change pit remaining in the vacant automotive service garage.

Due to the vacant status of the building and poor condition of ACM and LBP in the building and debris pile, there is the potential for these contaminants to be released into the environment in the form of dust, a potential inhalation/ingestion exposure pathway.

USTs, lifts, and the oil-change pit may contain remnant petroleum products. If these features are left in their current status, any remaining fluids could be released to the subsurface soil or groundwater or encountered during future excavation/construction work. Therefore, there is the potential for future direct contact exposure pathways for construction or excavation workers if these features are either inadvertently encountered, or for future Site occupants in the event they result in a release to the subsurface.

6 Cleanup Objectives & Applicable Regulations

This ABCA document evaluates several alternatives for site remediation and provides a recommended strategy for site remediation. The recommended cleanup objectives for the Site will be protective of human health and the environment and comply with all applicable federal, state, and local regulations.

6.1 Cleanup Objectives

The primary cleanup objective is the protection of human health and the environment. This objective will be completed by removing the ACMs and LBP; decommissioning the UST(s), in-ground hydraulic lifts, and oil-change pit; and further investigating the petroleum product impacts to soils, and if required remediating soils to below the applicable ODEQ Risk-Based Cleanup standards. The Site end use is anticipated to be for commercial use, initially contemplated as an indoor farmer's market or job incubation center. Other potential use includes leasing a portion of the building for use as a bank branch or pharmacy. Grant-related community engagement activities will be leveraged to establish a reuse plan that is consistent with community needs and opinions.

The cleanup objectives of this ABCA are:

- decommissioning by closure-in-place of the UST,
- decommissioning by removal of the in-ground hydraulic lifts and oil-change pit,
- the removal of ACMs and LBP from the building, and
- removal of the debris pile as regulated ACM waste

6.2 Cleanup Standards

The Site has entered into a Voluntary Cleanup Agreement with ODEQ (Environmental Cleanup Site Inventory # 6462). ODEQ will oversee the decommissioning of USTs/lifts/oil-change pit, further soil and groundwater assessment, and abatement of ACM and LBP at the Site. Cleanup standards will comply with EPA, ODEQ, and local regulations, as applicable.

6.2.1 Decommissioning of USTs

The decommissioning of UST(s) and any subsurface analytical sampling associated with UST decommissioning activities will be performed in accordance with:

- OAR 240-122-0205 through 340-122-0360 (leaking underground storage tank program) and 340-150-001 through 340-150-620 (underground storage tank program)
- OAR 340-177-001 through 340-177-0095 (heating oil underground storage tank)

6.2.2 Decommissioning of In-Ground Hydraulic Lifts and Oil Change Pit

The decommissioning of in-ground hydraulic lifts and the oil-change pit, along with any subsurface analytical sampling associated with UST decommissioning activities will be performed in accordance with ODEQ OAR 340-122-the Hazardous Substance and Remedial Action Rules. Any regulated chemical constituents discovered in soil/groundwater/vapor during decommissioning activities will be compared to ODEQ RBCs to determine if further corrective action is warranted to achieve cleanup objectives.

6.2.3 Asbestos and Lead-Based Paint

Though cancer risk from exposure to asbestos is most appropriately viewed as a chronic concern, short-term standards have been established by OSHA's permissible exposure limits (PEL) to limit exposures to workers in the workplace. There are two types of short-term limits, as follows:

- Excursion Limit (EL) – 1.0 fibers per cubic centimeter (f/cc), analyzed by Phase Contract Microscopy (PCM)
- 8-Hr Time Weighted Average (TWA) – 0.1 f/cc, analyzed by PCM

For LBP, the OSHA limits lead exposure to workers in the workplace with the following standard:

- 8-Hr TWA – no greater than 50 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$); PEL is reduced when an employee is exposed to lead for more than 8 hours in any work day with the equation $\text{PEL} = 400/\text{hours worked}$.

EPA Asbestos Hazard Emergency Response Act (AHERA) regulations (40 CFR 763) require aggressive clearance sampling after asbestos abatement activities. Leaf blowers and fans are used to disturb the interior air and air samples are collected according to the standard methods set forth in Appendix A of Subpart E of 40 CFR Part 763. The clearance criteria as set forth in this regulation are:

- PCM clearance: 0.01 f/cc
- Transition Electron Microscopy (TEM) clearance: 70 structures per square millimeter (structures/ mm^2)

Although AHERA regulations apply to abatement in schools, the same standards are generally used for all abatement projects.

HUD Guidelines for Evaluation and Control of Lead-Based Paint Hazards Chapter 15 Clearance provide the following clearance criteria for lead-based paint abatement:

- 40 micrograms of lead in dust per square foot on floors;
- 250 micrograms of lead in dust per square foot on interior window sills; and
- 400 micrograms of lead in dust per square foot in window troughs.

6.2.4 Asbestos Laws and Regulations

Asbestos is regulated by the AHERA, the Toxic Substances Control Act (TSCA), the Clean Air Act (CAA), and Oregon Administrative Rule (OAR) 340-248-005 through 340-248-0280. Further, to protect asbestos abatement workers all asbestos abatement work must be performed in accordance with Occupational Safety and Health Administration (OSHA) asbestos regulations as promulgated in Title 29 of the Code of Federal Regulations (29CFR), Section 1926.1101.

The following work practices should be followed whenever demolition/renovation activities involving ACM occur:

- Prepare abatement specifications by a EPA-licensed Asbestos Designer;
- Notify the ODEQ of intention to demolish/renovate by the required notification form;

- Remove all ACM from facility being demolished or renovated before any disruptive activity begins;
- Handle and dispose of all ACN in an approved manner (USEPA, 2006a; Asbestos/NESHAP Regulated Asbestos-Containing Materials Guidance);
- Monitor asbestos abatement activities by a EPA-licensed Asbestos Abatement Supervisor;
- Perform air clearance testing upon completion of ACM abatement; and
- Prepare an asbestos abatement Compliance Report.

6.2.5 Lead-Based Paint Laws and Regulations

Lead-based paint (LBP) in pre-1978 housing and children-occupied buildings is regulated under the authority of the Toxic Substances and Control Act (TSCA; 15 U.S.C. 2601 et seq.) as amended by the Residential Lead-Based Paint Hazard Reduction Act of 1992, generally referred to as Title X (of The Housing and Community Act of 1992 - Public Law 102-550). Title X mandates the training, certification and licensing of LBP abatement contractors, inspectors, risk assessors, and the training and certification of abatement workers and project designers. The Act also amended the Toxic Substances Control Act section 402 & 403. The provisions of Title X apply to residential buildings and child-occupied facilities.

It should be noted that these laws and regulations pertain to Target Housing or Child Occupied Facilities as defined by HUD. The on-site structure is not considered Target Housing or a Child Occupied Facility, and the proposed development as a farmers market will not be considered a child-occupied facility. As a good work practice and to limit lead exposure to workers, it is recommended that the identified LBP be abated prior to renovation.

Oregon has delegated authority from the EPA to administer LBP regulation. Oregon Bill 871, passed in 2017, authorizes local permitting authorities to adopt ordinances for controlling lead dust created by renovation or demolition. Klamath County, the local permitting authority for the Site, requires LBP abatement be formed by an Oregon-licensed abatement contractor. It is recommended any LBP abatement on the Site further follows the Oregon Health Authority published the "Best Practices for the Demolition of Residences with Lead-Based Paint," January 1, 2018.

The Occupational Safety and Health Administration has published regulations regarding worker safety during activities involving lead-based paint abatement. The Construction Standards (29 CFR Part 1926) and the OSHA (29 CFR Part 1910) promulgate a permissible exposure limit for lead construction workers, including workers performing demolition, salvage, or renovation of lead-containing materials at sections 1926.62 and 1910.1025 as follows:

"The employer shall assure that no employee is exposed to lead at concentrations greater than fifty micrograms per cubic meter of air ($50 \mu\text{g}/\text{m}^3$) averaged over an 8-hour period." (29 CFR 1926.62) Additional regulations under these chapters address other worker safety precautions such as respiratory protection programs, work practices, and medical monitoring. Lead-based paint debris (material containing or surfaced with lead-based-paint) from commercial buildings may be classified as hazardous waste if lead concentrations exceed the Toxicity Characteristic Rule (40 CFR 261.24, 40 CFR 262.11) concentration limit of 5.0 milligram per liter (mg/L) in sample extract prepared according to the Toxicity Characteristic Leaching Procedure, test

Method 1311 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846.

As previously noted, there is lead identified in painted surfaces above the detection limit but below the reportable thresholds which were not identified as lead-based paint. Upon the abatement of all lead-based paint, there will still be lead containing building materials and painted surfaces that would be regulated by OSHA as noted above.

6.3 National Environmental Policy Act

The Site will be reviewed for the following considerations as outlined in the National Environmental Policy Act: federally designated wilderness areas or wildlife preserves, nationally designated scenic rivers, threatened or endangered species, floodplain and wetland areas, archeological and historical resources, and Native American resources. As applicable, the Oregon State Historic Preservation Office and local federally-registered tribes will be notified of planned scope of work for comment and guidance.

6.4 Davis-Bacon Act

All work funded by the Brownfields grant must comply with the US Department of Labor (DOL) Davis-Bacon Act (DBA), which requires payment of prevailing wage rates for cleanup activities. The budget and schedule will take this into account. More details regarding the Davis-Bacon Act can be found on the DOL's website: <https://www.dol.gov/whd/regs/compliance/whdfs66.pdf>.

Cardno, as the Qualified Environmental Professional (QEP) for the City under their EPA grant, will be responsible for overseeing Davis-Bacon Act requirements on behalf of the City.

7 Brownfield Cleanup Alternatives

The following section presents a discussion of the cleanup objectives, alternatives screening process and rationale, alternative analysis, and presents a likely budget for the proposed cleanup. The primary cleanup objectives are to mitigate impacted soils throughout the Site to protect public health and the environment.

7.1 Asbestos and Lead-Based Paint

7.1.1 Alternative 1 – No Action

The No Action alternative is included as a baseline comparison to other remedial alternatives. The No Action alternative assumes no action is taken and is not a valid option for the site, given the hazards to human health and the environment.

7.1.2 Alternative 2 – Encapsulation and/or Enclosure

Encapsulation involves the complete encapsulation of a hazardous material with another material. This mainly applies to lead-based paint, and the encapsulant is typically a sealant or coating that goes over the paint to prevent peeling, cracking, and deterioration which leads to the release of lead.

Enclosure involves the complete covering of a hazardous material with a solid, preferable dust tight, barrier. The enclosure prevents access, as well as prevents damage or dispersion of hazardous materials. Enclosure applies to both asbestos and lead-based paint.

The implementation of any encapsulation and/or enclosure would require the use of an Operations and Maintenance (O&M) plan to assess the effectiveness.

Neither encapsulation nor enclosure would be applicable given the location and types of ACM identified. In addition, this option would ultimately require that hazardous materials remain on-Site. Therefore this alternative is not a valid option for the Site, given the hazards to human health and the environment.

7.1.3 Alternative 3 – Full Abatement

Full abatement would include the removal of all LBP and ACMs in accordance with applicable regulations.

Feasibility: This alternative is considered feasible given the site conditions. It should be noted that not all ACM and LBP is required to be removed given the current regulatory standards. Typically the abatement of LBP involves scrapping of painted surfaces. Scrapping may not remove all lead-based paint. Given this, typically encapsulation is used after scrapping to ensure any remaining LBP is fully encapsulated to prevent the risk of future exposure. Therefore, encapsulation of LBP is included as part of the full abatement alternative.

Effectiveness: Removal of contaminated material from a site is typically the most effective type of remediation, regardless of contaminant type. If encapsulation is included with the LBP abatement, then an O&M plan will need to be developed to assess the effectiveness.

7.2 Decommissioning of USTs, In-Ground Hydraulic Lifts, and Oil-Change Pit

7.2.1 Alternative 1 – No Action

The No Action alternative is included as a baseline comparison to other remedial alternatives. The No Action alternative assumes no action is taken and is not a valid option for the site, given the potential hazards to human health and the environment and proposed reuse plans.

7.2.2 Alternative 2 – Decommissioning In-Place of USTs, Decommissioning by Removal of In-Ground Lifts and Oil-Change Pit, and Engineering Controls

Presently there are up to two USTs, two in-ground hydraulic lifts, and one oil change pit on the Site. Engineering controls would involve the removal of the asphalt/concrete and impacted soil on top of the USTs, lifts, and oil-change pit, followed by:

- filling the UST(s) with an inert material to prevent future releases and to provide structural stability, and placing clean fill on top of the USTs to act as an impermeable barrier to cap the impacted soil and USTs.
- Removal of in-ground lifts and backfilling of cavity with clean backfill.
- Removal of concrete from oil-change pit and backfilling of cavity with clean backfill.

Either two feet of clean soil cover over UST(s) and/or lift/pit cavity, or additional impermeable pavement would be considered as an engineering control to prevent direct exposure.

Feasibility: This alternative is considered feasible throughout most of the Site. It will allow for preservation of the garage's structural integrity around the UST(s), which are positioned near building foundation/structural walls. It will also allow for the removal of lifts and backfilling of oil-change pit in areas where excavation work will not compromise structural building elements.

Effectiveness: This alternative is effective in controlling the potential exposure to impacted soils. It is anticipated that soil impacts will be consistent with data collected to date; as such, this method will comply with ODEQ regulations.

7.2.3 Alternative 3 – Decommissioning by Removal of USTs, In-Ground Lifts and Oil-Change Pit, Disposal of Impacted Soil and Backfill

Given the proximity and likelihood the USTs extend near or beneath structural walls, excavation could not occur without first demolishing sections of the building. Once this USTs are removed, confirmatory sampling would be completed post excavation, and, if required, any impacted soil would be excavated in accordance with ODEQ regulations.

Feasibility: This alternative is considered feasible.

Effectiveness: Removal of impacted material from a site is typically the most effective type of remediation, regardless of impact type. However, it would require significant building and site alterations.

8 Recommended Cleanup Alternative

8.1 Abatement of LBP and ACM

Selected Action: Alternative 3 – Full Abatement

ACM

Given condition and location, the identified ACM will be properly abated by an Oregon-licensed abatement firm in accordance with the Environmental Protection Agency's (EPA) Asbestos Hazardous Emergency Response Act (AHERA) and the Occupational Safety and Health Administration (OSHA) regulations.

All material will be abated by licensed asbestos abatement workers under the supervision of a licensed asbestos abatement supervisor. All abatement work will be conducted under an approved asbestos abatement design plan. This design will outline the required personal protection equipment (PPE), negative pressure enclosures, disposal methods, work zones, and decontamination/clean rooms.

Air monitoring is recommended to verify the efficiency of containment areas and to ensure the safety of the public or work personnel not in a designated work zone.

All asbestos containing waste material will be double-bagged with polyurethane sheeting and labelled as asbestos containing waste. All asbestos containing waste will be disposed of as hazardous waste at a regulated landfill.

Lead-Based Paint

Given its condition and location, the identified lead-based paint will be abated by a licensed abatement firm in accordance with EPA and OSHA regulations.

The lead-based paint will be scrapped to the substrate and any debris will be collected utilizing a Class H wet/dry shop vacuum equipped with a High Efficiency Particulate Air (HEPA) filter. After all scrapable paint is removed, two coats of a clear lead encapsulate will be applied to stabilize and remaining lead-based paint. The lead encapsulate will be applied using an airless sprayer.

A toxicity characteristic leachate procedure (TCLP) lead test will be performed on all waste to determine the proper disposal methods.

8.2 Decommissioning of USTs, In-Ground Hydraulic Lifts, and Oil-Change Pit

Selected Action: Alternative 2 – Decommissioning In-Place of USTs, Decommissioning by Removal of In-Ground Lifts and Oil-Change Pit, and Engineering Controls

UST Decommissioning by Closure-In -Place

The removal of approximately 200 square feet of concrete and soil on top of the UST(s) is required to determine the presence of the USTs, their construction materials, and capacity. It is

anticipated that approximately two feet of soil potentially impacted with petroleum product is located on top of the USTs, totaling approximately 15 CY that will need to be excavated. Upon confirmation and access, the UST(s) will need to be filled with an inert material, likely foam, to limit the potential for future releases and provide structural stability. It is unknown how much inert materials is needed, but an estimated average of 1,000 gallon capacity per UST with potentially two USTs results in approximately 2,000 gallons of inert materials may be needed. Then the excavated area will need to be filled with approximately 15 CY of clean fill material and an additional impermeable pavement to act as an engineered cap.

In-Ground Hydraulic Lift and Oil-Change Pit Decommissioning by Removal

The removal of approximately 50 square feet of concrete surrounding in-ground lifts and oil-change pit is required to expose lifts and soils beneath the oil-change pit. Following concrete removal the lifts and associated oil reservoirs will be extracted from the ground and transported for disposal or recycling in accordance with federal, state and local regulations. The excavations/cavities will be backfilled with clean soil and covered with an additional impermeable pavement to act as an engineered cap.

Backfill and Soil Management

It is anticipated that any soil removed from the designated excavation areas that requires off-Site disposal will be directly loaded and transported and disposed of in accordance with federal, state and local regulations. Composite waste characterization samples should be collected prior to initiating the excavation to expedite the remedial process. Non-hazardous soil will be transported to a Subtitle D landfill.

The backfill will be sampled at the source prior to initiating excavation to document no environmental impacts have been added to the site. The clean fill will be added to the excavation areas and compacted to a condition similar to that encountered prior to excavation. The surface of the backfill areas will be surfaced with concrete to a thickness consistent with surrounding conditions.

8.3 Remedial Cost Analysis

The goal of the project is to address the environmental concerns associated with the asbestos and lead impacts and to address any potential soil and groundwater contamination to protect the human health and the environment, and to prepare the site for potential redevelopment. Provided below is a summary of costs associated with the above selected options so that the financial limitations can be evaluated and balanced with respect to available funds for a potential cleanup grant.

Activity	Estimated Quantity	Unit Price	Cost
Hazardous Building Material Abatement			
ACM – Interior white skim coat on plaster surfacing	3600 SF	\$10.00	\$36,000.00
ACM – Interior white texture and joint compound on drywall	800 SF	\$7.50	\$6,000.00

Activity	Estimated Quantity	Unit Price	Cost
Hazardous Building Material Abatement			
ACM – Interior white caulk	30 LF	\$25.00	\$750.00
LBP – Red paint on CMU on the south exterior wall	3600 SF	\$10.00	\$36,000.00
LBP – Tan/gray paint on wood on the Room 3 ceiling.	1200 SF	\$10.00	\$12,000.00
Subtotal			\$90,750.00
Interior Subsurface Actions			
Design Phase Investigation	1	\$40,000.00	\$40,000.00
Design & Bidding	1	\$15,000.00	\$15,000.00
UST Abandonment	2	\$20,000.00	\$40,000.00
Oil Change Pit Abandonment	1	\$15,000.00	\$15,000.00
Lift Abandonment	2	\$6,000.00	\$12,000.00
Subtotal			\$122,000.00
Oversight & Programmatic			
Engineering Oversight & Technical Reporting	1	\$62,250.00	\$62,250.00
Programmatic and Closeout Reporting	1	\$30,000.00	\$30,000.00
Subtotal			\$92,250.00
Contingency [Former Mercantile Building Subsurface (Below Rubble Plie)]			
Corrective Action Contingency	1	\$55,000.00	\$55,000.00
Subtotal			\$55,000.00
		Total	\$360,000.00
		Grand Total	\$360,000.00

Please note that these costs represent an estimate of probably costs.

9 Schedule

Pending the FY2022 EPA Brownfield Cleanup Grant award, it is anticipated the overall selected cleanup alternative will be completed by summer 2023.

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10 Certification Statement

I certify that this report and all attachments were prepared under my direction in accordance with a system designed to assure that qualified personnel properly evaluated the information submitted. Based on my inquiry of the person or persons who prepared the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

Cardno

Sam Urban
Project Manager

Date: DRAFT

I certify that I currently hold an active license and am competent through education and experience to provide the geologic services contained in this report. I further certify that this report was prepared by me or under my direct supervision.

Cardno

Kari Chappell, RG
Project Geologist

Date: DRAFT

11 References

Regulatory Information Sources

Oregon Administrative Rules, <https://sos.oregon.gov/>

Oregon Department of Environmental Quality (ODEQ). July 1, 1998b. *Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites*. (October 2017 update to contact information and website links).

Oregon Department of Environmental Quality (ODEQ). July 1, 1998a. *Guidance for Consideration of Land Use in Environmental Remedial Actions*. (October 2017 update to contact information and website links).

Oregon Department of Environmental Quality, Environmental Cleanup Program (ODEQ). May 2018. *Risk-Based Concentrations for Individual Chemicals*

Recorded Information Sources

Cardno. May 17, 2021a. *Asbestos & Lead-Based Paint Survey, Former Markwardt Brothers Garage, North 1st Avenue and West Chocktoot Street, Chiloquin, Klamath County, Oregon*.

Cardno. May 17, 2021b. *Phase I Environmental Site Assessment, Former Markwardt Brothers Garage, Chiloquin, Klamath County, Oregon*.

Cardno. June 23, 2021c. *Phase II Environmental Site Assessment Work Plan, Former Markwardt Brothers Garage, North 1st Avenue and West Chocktoot Street, Chiloquin, Oregon*.

FORMER MARKWARDT
BROTHERS GARAGE

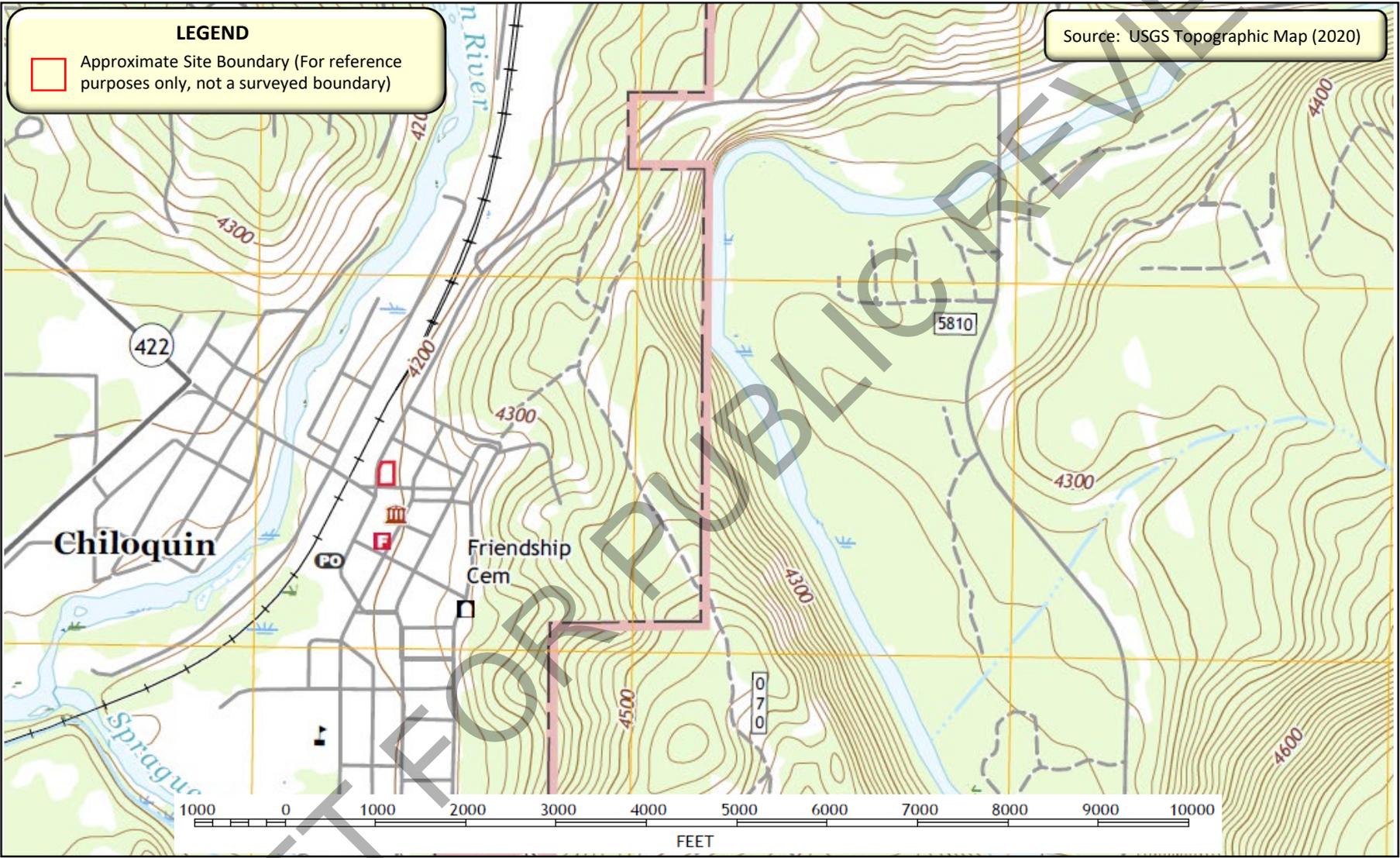
FIGURES



Source: USGS Topographic Map (2020)

LEGEND

 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



LEGEND

 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



Map not scaled

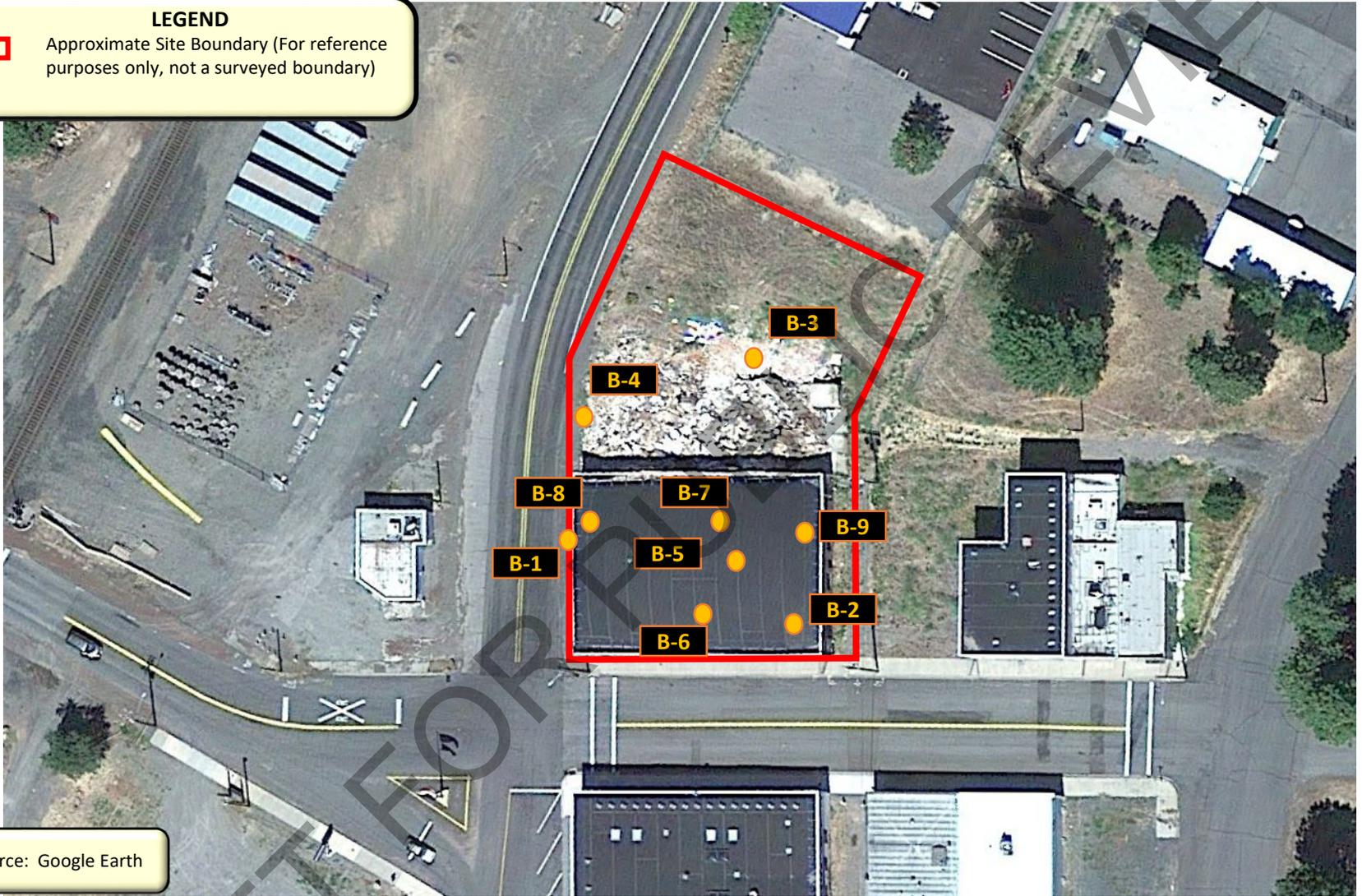
**Analysis of Brownfield Cleanup Alternatives
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ200**

**Figure 2
Site Boundary Map**

LEGEND



Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



Map not scaled

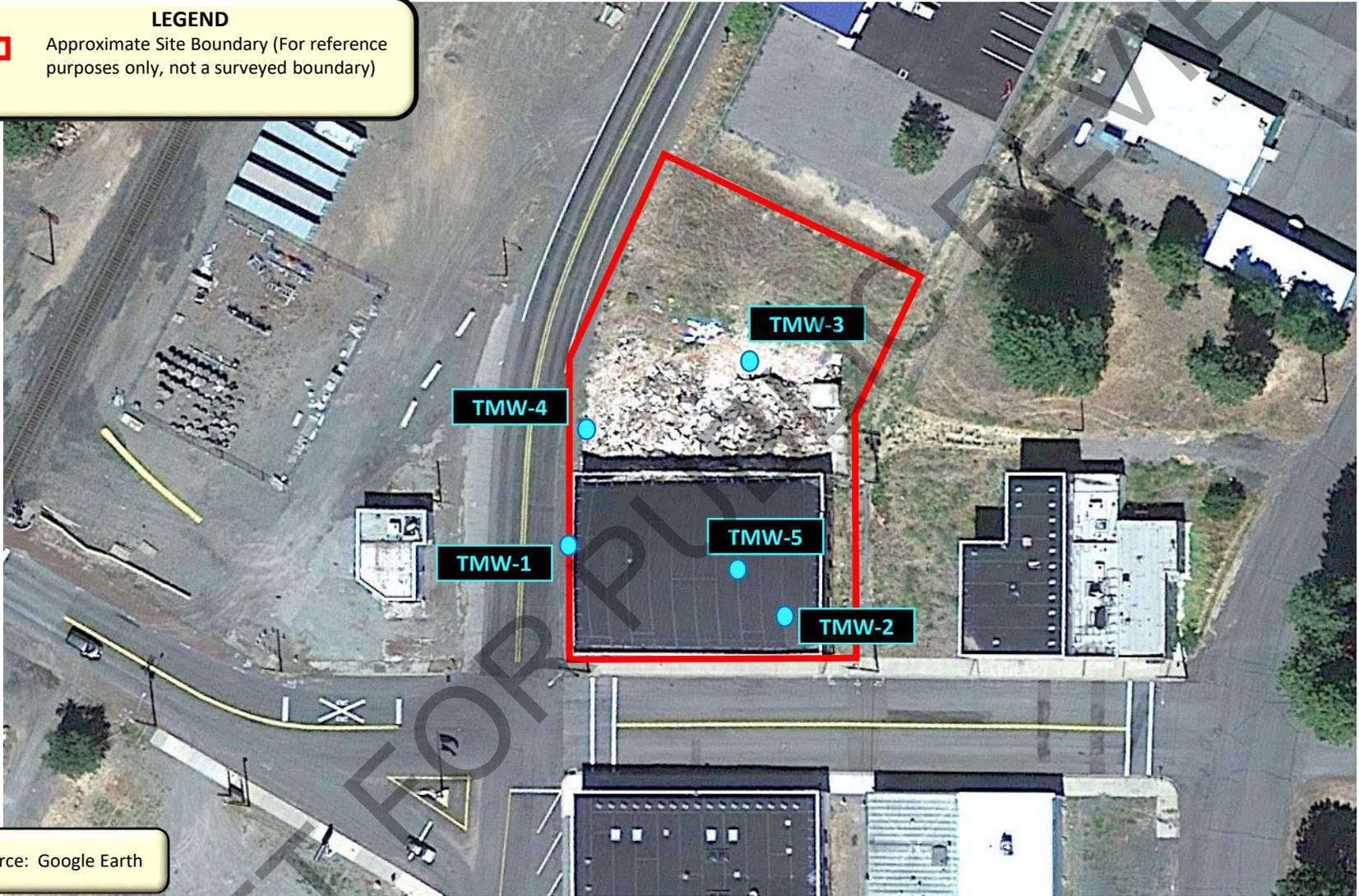
Analysis of Brownfield Cleanup Alternatives
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ200

Figure 3
Soil Boring Location Map

LEGEND



Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



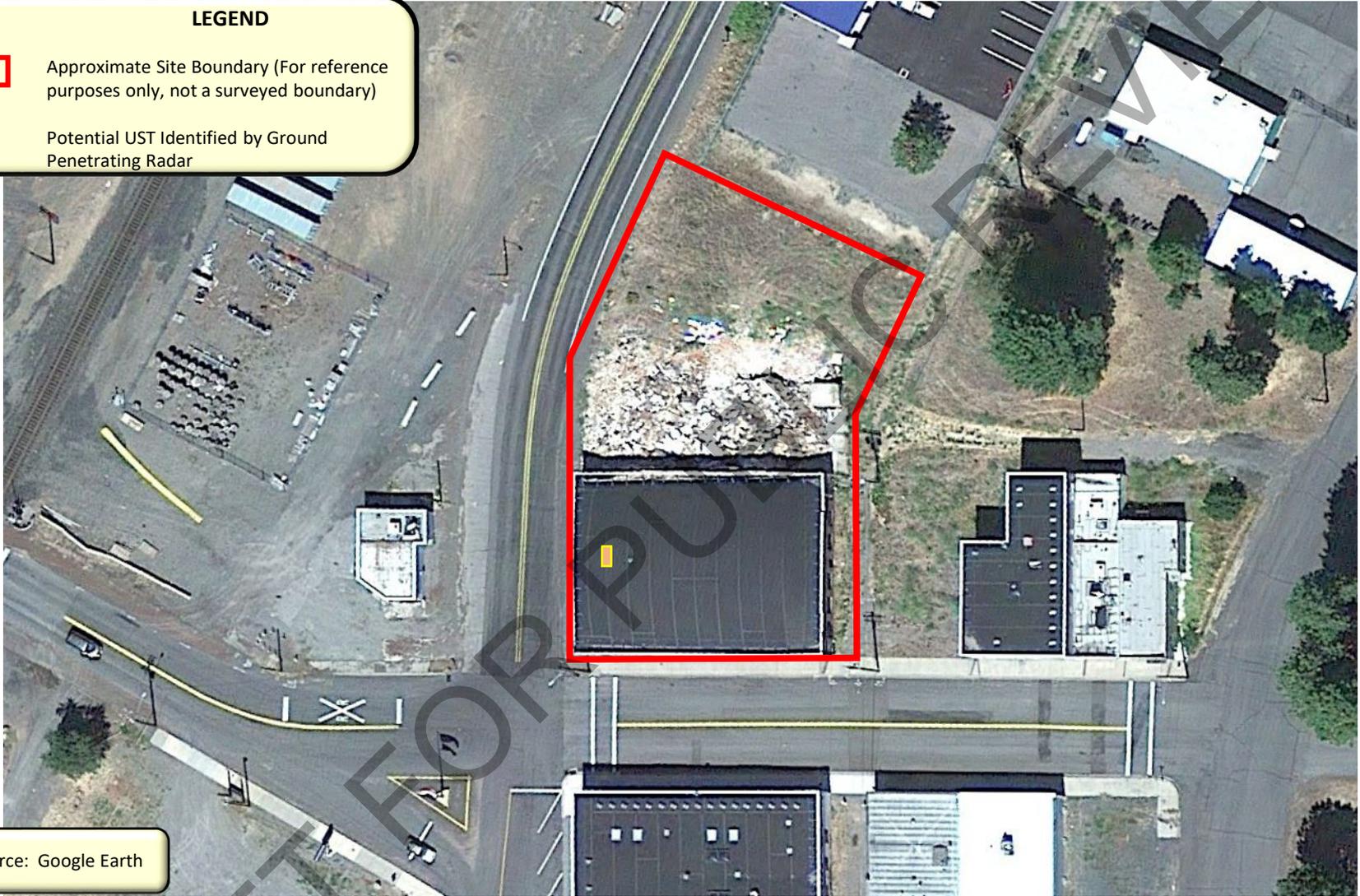
Map not scaled

Analysis of Brownfield Cleanup Alternatives
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ200

Figure 4
Temporary Monitoring Well
Location Map

LEGEND

-  Approximate Site Boundary (For reference purposes only, not a surveyed boundary)
-  Potential UST Identified by Ground Penetrating Radar



Source: Google Earth



This is not a map of survey.



Map not scaled

**Analysis of Brownfield Cleanup Alternatives
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ200**

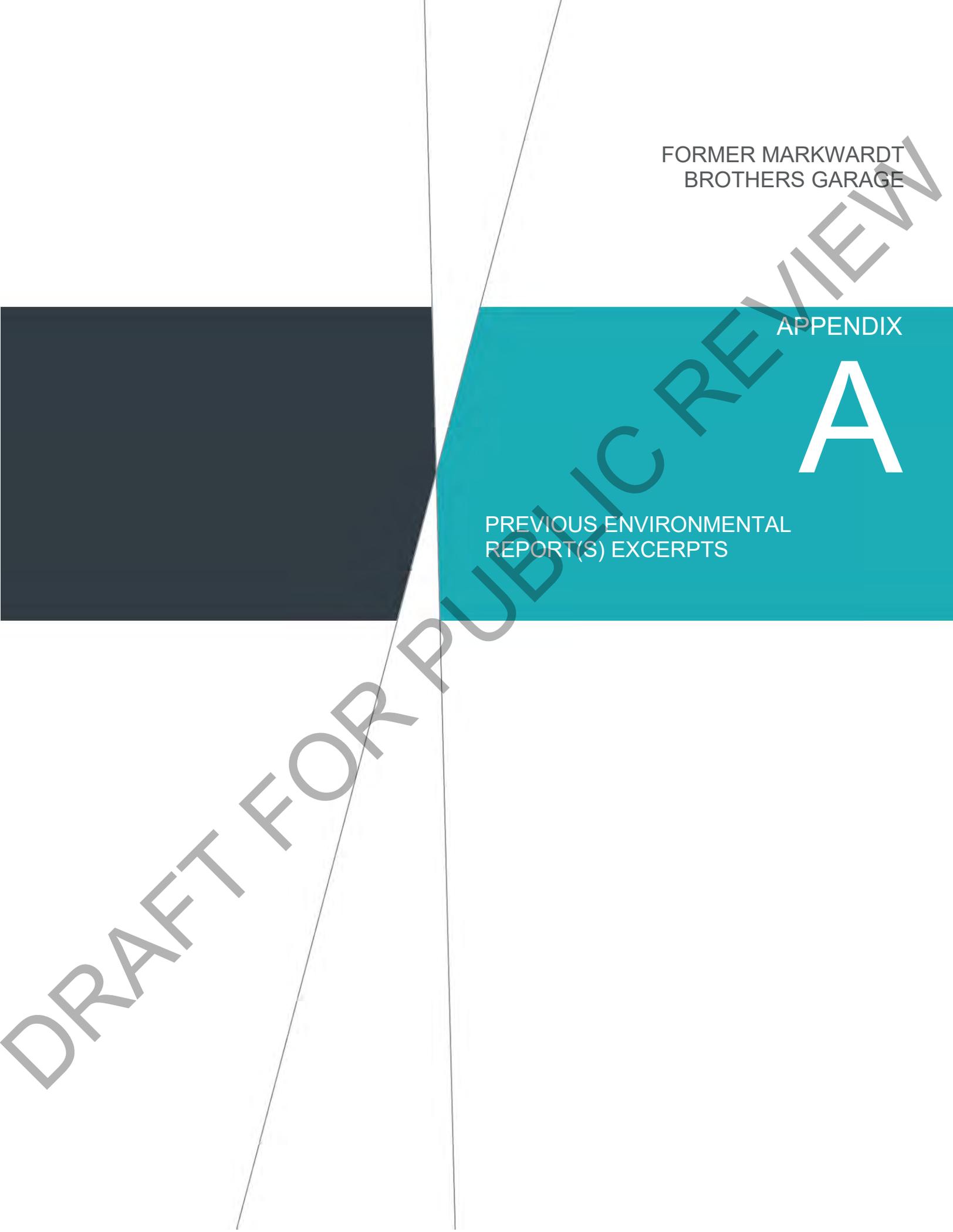
**Figure 5
Potential UST Location Map**

FORMER MARKWARDT
BROTHERS GARAGE

APPENDIX

A

PREVIOUS ENVIRONMENTAL
REPORT(S) EXCERPTS



Phase I Environmental Site Assessment Report

Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon

May 17, 2021

Prepared for:
City of Chiloquin, Oregon



Phase I Environmental Site Assessment Report

Prepared for: City of Chiloquin, Oregon

Project Name: **Phase I Environmental Site Assessment**
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon

Cardno Project #: CHILOQ100

Date: May 17, 2021

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1 Executive Summary

Cardno has completed a Phase I Environmental Site Assessment (ESA) of the Former Markwardt Brothers Garage property located in Chiloquin, Klamath County, Oregon (**Figure 1**). The Subject Property is currently developed with a single-story commercial building totaling approximately 8,500 square feet (sq. ft.) of concrete block and brick construction, some of which is coated with plaster/stucco.

According to the City of Chiloquin Public Works Department, the remaining on-site building was utilized as an auto repair/car dealership facility from approximately the 1930s – 1960s; second-hand store in the 1970s; and Juniper wood products facility in the 1980s. Until recently the area of the site to the north of the on-site building was occupied by a commercial building that recently collapsed with the exception of a vault that still remains. All that remains is a pile of rubble. This building was formerly occupied by the Chiloquin Mercantile. The area to the north of the rubble pile consist of vacant land once occupied by a rooming house.

The remaining building is currently vacant and the site is owned by and in the care of Klamath County. The subject site/property is located in downtown Chiloquin, Oregon, which will herein be referred to as “The Subject Site/Property” or “the Site”. According to information on the Klamath County Tax Assessor records the Subject Property consists of two parcels (Parcel ID 3407-034DC-00500 and Parcel ID 3407-034DC-00400) of land totaling approximately 0.55 acres and is located at the northeast of the North 1st Avenue and West Chocktoot Street intersection (**Figure 2-3**).

Photos of the Subject Property and surrounding properties taken during the site visit are provided in **Appendix A**. A surrounding land use map is provided as **Figure 4**. This assessment was performed under and funded by the City of Chiloquin’s Business of Oregon Brownfield Grant in general accordance with *40 CFR Part 312 Standards and Practices for All Appropriate Inquiries* and *ASTM Standard Practices E1527-13 for Environmental Site Assessments*.

This assessment was performed to satisfy the requirements of City of Chiloquin (Client) with respect to identifying potential environmental impairment and liabilities associated with the property due to contamination by hazardous substances, controlled substances, or petroleum products on or near the site. The City of Chiloquin is considering taking title to the Subject Property and is of the opinion that the property may have significant residential, commercial, or mixed-use development potential.

This Phase I Environmental Site Assessment was completed in general accordance with ASTM Standard: E 1527-13 – Standard Practice for Environmental Site Assessments. This report meets the general requirements for conducting all appropriate inquiry into the previous ownership, uses, and environmental conditions of a property, as specified in 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries. Furthermore, this work was conducted by or under the responsible charge of an environmental professional as defined in 40 CFR §312.10.

ASTM Standard Practice E1527-13 defines a Recognized Environmental Condition (REC) as:

“The presence or likely presence of any hazardous substances or petroleum products in, on, or at a property: 1) due to any release to the environment, 2) under conditions indicative of a release to the environment; or 3) under conditions that pose a material threat of a future release to the environment. The term is not intended to include *de Minimis* conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies.”

ASTM Standard Practice E1527-13 defines a Controlled Recognized Environmental Condition (CREC) as:

“A recognized environmental condition resulting from a past release of hazardous substances or petroleum products that has been addressed to the satisfaction of the applicable regulatory authority (for example, as evidenced by the issuance of a no further action letter or equivalent, or meeting risk-based criteria established by regulatory authority), with hazardous substances or petroleum products allowed to remain in place subject to the implementation of required controls (for example, property use restrictions, activity and use limitations, institutional controls, or engineering controls).”

ASTM Standard Practice E1527-13 defines a Historical Recognized Environmental Condition (HREC) as:

"A past release of any hazardous substances or petroleum products that has occurred in connection with the property and has been addressed to the satisfaction of the applicable regulatory authority or meeting unrestricted residential use criteria established by a regulatory authority, without subjecting the property to any required controls."

1.1 Findings and Conclusions

Cardno completed this Phase I ESA of the Subject Site in conformance with the scope and limitations of ASTM Standard E 1527-13. Any exceptions to or deletions from this practice are described in Section 2.0 of this report. The following RECs associated with the Subject Property were identified during this assessment:

FINDINGS AND CONCLUSIONS SUMMARY						
Report Section	Further Action?	De minimis Condition	REC and/or CREC	HREC	Description	
4.0	User Provided Information	No	No	No	No	
5.1	Federal, State and Local Database Findings	No	No	No	No	The former Texaco gas station to the west across North 1 st Avenue is considered a HREC as it received a No Further Action designation from Oregon DEQ. (HREC #1).
5.2	Additional Environmental Record Sources	No	No	No	No	
5.3	Local Environmental Record Sources	No	No	No	No	
5.3	Historical Records Sources	Yes	No	Yes	No	A Printing facility (REC #4) and a Cleaning facility (REC #5) were identified in the 1931 Sanborn FIM.
6.2	Hazardous Substance Use, Storage and Disposal	Yes	No	Yes	No	Former use as an auto repair garage of unknown best management practices in disposal of hazardous substances (REC #2).
6.3	Underground Storage Tanks	Yes	No	Yes	No	Possible UST(s) and/or heating oil tank on the Subject Property (REC #1 & 3).
6.4	Aboveground Storage Tanks	No	No	No	No	
6.5	Other Petroleum Products	No	No	No	No	
6.6	Polychlorinated Biphenyls (PCBs)	Yes	No	Yes	No	Three in-ground hydraulic lifts were observed in the on-site building (REC #2).
6.7	Unidentified Substance Containers	No	No	No	No	
6.8	Nonhazardous Solid Waste	No	No	No	No	A pile of wood chips was observed within the on-site building. The former adjacent building to the North was demolished and the associated debris remains on-site.
6.9	Wastewater	No	No	No	No	
6.10	Waste Pits, Ponds, and Lagoons	No	No	No	No	
6.11	Drains and Sumps	No	No	No	No	
6.12	Septic Systems	No	No	No	No	

6.13	Storm water Management System	No	No	No	No	A stormwater drain was observed along W. Chocktoot St.
6.14	Wells	No	No	No	No	
7.0	Subsurface Vapor Migration	Yes	No	Yes	No	There is potential for vapor migration from the RECs below (RECs #1-5).
8.0	Interviews	No	No	No	No	
9.1	Asbestos Containing Material	Yes	No	No	No	Asbestos-containing materials have been identified in association with the remaining building. The potential for asbestos containing material in the debris from the collapsed building also exists.
9.2	Lead-Based Paint	Yes	No	No	No	Lead-based paints have been identified in association with the remaining building. The potential for lead-based paint in the debris from the collapsed building also exists.

The RECs identified during this assessment are located on **Figure 6**. Phase II ESA investigations and/or other actions are recommended to fully characterize the Subject Property.

On-Site REC

1. According to the 1931 Sanborn FIM, the building was used as an auto repair garage and an area with-in the on-site building, at the southwest corner, is labeled "Gas & Oil". Further, during site reconnaissance, Cardno personnel identified a potential UST vent pipe attached to the west interior wall of the on-site building. Therefore, there is potential for a UST(s) to exist on the property and said tank may have impacted the soil, groundwater, and/or vapor at the Subject Property.
2. The remains of three in-ground hydraulic lifts and one oil-changing pit were observed in the building. According to the 1931 Sanborn Fire Insurance Map (FIM), the on-site building is labeled as being an auto repair/garage facility. Additionally, based on the age of the building, this time-frame predates the regulation of the storage/disposal of hazardous substances such as used oil and other non-regulated automobile chemicals. Based on the age and duration of use, the in-ground lifts and unknown chemical management and disposal practices associated with historic operations, site soil, groundwater, and/or vapor may have been impacted by historic site operations.
3. During site reconnaissance, Cardno identified a potential vent pipe in the interior of the building along the eastern wall. This could be an indication for a UST and/or heating oil tank to exist on the Subject Property. Based on the age and duration of the former use of the building, there is potential for a UST/heating oil tank on the property that may have impacted the soil, groundwater, and/or vapor at the Subject Property.

Off-Site RECs

4. According to the 1931 Sanborn FIM, a Printing facility is located approximately 80 feet to the east. The length of operation for this facility is unknown. There is potential for a release from this facility.
5. According to the 1931 Sanborn FIM, a Cleaning facility is located approximately 120 feet to the southeast. The length of operation for this facility is unknown. There is a potential for a historic release from this facility.

Off-site HRECs

1. According to Oregon Department of Environmental Quality (ODEQ) records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989 which predates UST registration. These tanks were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. The

new tanks were subsequently removed in 2017. Post-excavation confirmation sampling conducted in 2017 and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low. On July 22, 2019, ODEQ granted an NFA determination letter for the Chiloquin Texaco site. Based on the issuance of an NFA, and given the assumed ground waterflow direction away from the subject site, this facility is considered a historical REC. See Section 5.1 for further details.

Asbestos-Containing Materials

Asbestos containing materials (ACMs) were identified throughout the interior of the building including:

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-site building.
- Interior white texture and joint compound on drywall, totaling approximately 1000 SF, located within the western most portions of the on-site building.
- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

Overall, given the state of the buildings, most of these materials were in good to fair condition. Therefore, the identified ACM has a low probability of disturbance during ordinary use. Prior to any renovation or demolition that may cause the ACM to become friable, the material should be removed or abated by a qualified asbestos abatement contractor.

The following suspect building materials were not sampled and should be considered presumed asbestos containing materials (PACM):

- Exterior building debris from former attached north addition, totaling approximately 650 cubic yards (CY).

The building to the north was constructed around the same time as the remaining building, and the building debris appeared to have suspect materials. Therefore, the building debris/rubble should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

Lead-Based Paint

Lead-based paint (LBP) was identified on various painted surfaces throughout the interior and exterior of the building in various tenant spaces including:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.
- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

Most of the identified painted surfaces were in poor condition, with peeling and deterioration noted. As the building is not considered to be child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition.

A more detailed summary of the ACM and LBP inspection will be provided under a separate cover and included as **Appendix H**.

Please note: This is a cursory summary of findings. The full report must be read in its entirety for a comprehensive understanding of the stated conclusions/recommendations

2 Introduction

2.1 Purpose

The purpose of this Phase I ESA was to identify RECs in connection with the property at the time of the site reconnaissance. The scope of work for this Phase I ESA may also include certain potential environmental conditions beyond the scope of *ASTM Standard Practice E1527-13*. This report documents our assessment, conclusions, and recommendations.

2.2 Detailed Scope of Services

This Phase I ESA was conducted in general accordance with the *ASTM Standard Practice E1527-13*, consistent with a level of care and skill ordinarily practiced by the environmental consulting profession currently providing similar services under similar circumstances. Significant additions, deletions or exceptions to *ASTM Standard Practice E1527-13* are noted below and detailed in the corresponding sections of this report. The scope of this assessment included following evaluations:

- Assessment of the physical characteristics of the property through a review of referenced sources such as available topographic maps and geologic, soils, and hydrogeological reports.
- Review of the Subject Property, adjoining properties, and surrounding area via referenced historical sources such as land title records, fire insurance maps, city directories, aerial photographs, prior reports, and interviews.
- Site observation and interviews with knowledgeable persons regarding the current property usage and conditions including: use, treatment, storage, disposal, or generation of hazardous substances/waste, petroleum products, nonhazardous solid wastes, and wastewater.
- Assessment of the use and condition of adjoining and surrounding properties and their likely impact on the Subject Property from known or suspected releases of hazardous substances or petroleum products.
- Review of information in referenced environmental agency databases and local environmental records from within the specified minimum search distances from the property.
- Assessment of the potential for subsurface vapor encroachment.
- Asbestos and Lead-Based Paint (LBP) sampling to identify asbestos-containing building materials (ACM) or LBP.

No additional investigations, work, or other quantitative/qualitative testing was performed as part of this assessment that was not required by the *ASTM Standard Practices E1527-13*. An example of non-scope investigations includes, but are not limited to, the following: Radon, Lead in Drinking Water, Wetlands, Regulatory Compliance, Cultural and Historic Resources, Industrial Hygiene, Health and Safety, Geotechnical Evaluation, Sinkhole Evaluation, Ecological Resources, Endangered Species, Indoor Air Quality, Vapor Intrusion, Biological Agents, and Mold.

2.3 Significant Assumptions

While this report provides an overview of potential past and present environmental concerns, the environmental assessment is limited by the availability of information at the time of the assessment. It

is possible that unreported disposal of waste or illegal activities impairing the environmental status of the property may have occurred which could not be identified.

The findings and recommendations regarding environmental conditions that are presented in this report are based on the scope of work authorized by the Client. It should be noted, that no matter how exhaustive an assessment might be, there still exists the potential for unidentified environmental conditions above or below ground. Cardno also assumes that the Client and other interested parties will read this report in its entirety.

2.4 Limitations, Exceptions, Deviations and/or Data Gaps

Cardno has prepared this Phase I ESA report using reasonable efforts to identify RECs associated with hazardous substances or petroleum products at the Site. Findings contained within this report are based on information collected from observations made during the site reconnaissance on October 6, 2020 and reasonably ascertainable information obtained from public agencies and other referenced sources.

The *ASTM Standard Practice E1527-13* recognizes inherent limitations for Phase I ESAs, including, but not limited to:

- *Uncertainty Not Eliminated* – A Phase I ESA cannot completely eliminate uncertainty regarding the potential for recognized environmental conditions in connection with any property.
- *Not Exhaustive* – A Phase I ESA is not an exhaustive investigation of the property and environmental conditions on such property.
- *Past Uses of the Property* – Phase I requirements only require review of standard historical sources at five-year intervals. Therefore, past uses of property at less than five-year intervals may not be discovered.

Users of this report may refer to *ASTM Standard Practice E1527-13* for further information regarding these and other limitations. This report is not definitive and should not be assumed to be a complete and/or specific definition of all conditions above or below grade. Current subsurface conditions may differ from the conditions determined by surface observations, interviews, and reviews of historical sources. The most reliable method of evaluating subsurface conditions is through intrusive techniques, which are beyond the scope of this report. Information in this report is not intended to be used as a construction document and should not be used for demolition, renovation, or other property construction purposes. Any use of this report by any party, beyond the scope and intent of the original parties, shall be at the sole risk and expense of such user.

Cardno makes no representation or warranty that the past or current operations at the property are, or have been, in compliance with all applicable Federal, State, and local laws, regulations, and codes. This report does not warrant against future operations or conditions, nor does it warrant against operations, conditions, and locations not investigated. Regardless of the findings stated in this report, Cardno is not responsible for consequences or conditions arising from facts not fully disclosed to Cardno during the assessment.

An independent data research company provided the government agency database referenced in this report. Information on surrounding area properties was requested for approximate minimum search distances and is assumed to be correct and complete unless obviously contradicted by Cardno's observations or other credible referenced sources reviewed during the assessment. Cardno shall not

be liable for any such database firm's failure to make relevant files or documents properly available, to properly index files, or otherwise to fail to maintain or produce accurate or complete records.

Cardno makes no warranty, guarantee or certification regarding the quality, accuracy, or reliability of any prior report provided to Cardno and discussed in this Phase I ESA report. Cardno expressly disclaims any and all liability for any errors or omissions contained in any prior reports provided to Cardno and discussed in this Phase I ESA report.

Cardno used reasonable efforts to identify evidence of aboveground and underground storage tanks and ancillary equipment on the property during the assessment. "Reasonable efforts" were limited to observation of accessible areas, review of referenced public records, and interviews. These reasonable efforts may not identify subsurface equipment or evidence hidden from view by things including, but not limited to, vegetation, paving, construction activities, stored materials, and landscaping.

Any estimates of costs or quantities in this report are approximations for commercial real estate transaction due diligence purposes and are based on the findings, opinions and conclusions of this assessment, which are limited by the scope of the assessment, schedule demands, cost constraints, accessibility limitations and other factors associated with performing the Phase I ESA. Subsequent determinations of costs or quantities may vary from the estimates in this report. The estimated costs or quantities in this report are not intended to be used for financial disclosure related to the *Financial Accounting Standards Board (FASB) Statement No. 143, FASB Interpretation No. 47, Sarbanes/Oxley Act* or any United States Securities and Exchange Commission reporting obligations, and may not be used for such purposes in any form without the express written permission of Cardno.

Cardno did not act as a professional title insurance or land surveyor firm as part of this investigation, and makes no guarantee, express or implied, that any land title records acquired or reviewed in this report, or any physical descriptions or depictions of the property in this report, represent a comprehensive definition or precise delineation of property ownership or boundaries.

The Environmental Professional statement in Section 1.1 of this report does not "certify" the findings contained in this report and is not a legal opinion of such Environmental Professional. The statement is intended to document Cardno's opinion that an individual meeting the qualifications of an Environmental Professional was involved in the performance of the assessment and that the activities performed by, or under the supervision of, the Environmental Professional were performed in conformance with the standards and practices set forth in 40 CFR Part 312 per the methodology in *ASTM Standard Practice E1527-13* and the scope of work for this assessment.

Per *ASTM Standard Practice E1527-13, Section 6, User Responsibilities*, the User of this assessment has specific obligations for performing tasks during this assessment that will help identify the possibility of recognized environmental conditions in connection with the property. Failure by the User to fully comply with the requirements may impact their ability to use this report to help qualify for Landowner Liability Protections (LLPs) under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Cardno makes no representations or warranties regarding a User's qualification for protection under any Federal, State or local laws, rules or regulations.

In accordance with the *ASTM Standard Practice E1527-13*, this report is presumed to be valid for a six-month period. If the report is older than six months, the following information must be updated in order for the report to be valid: (1) regulatory review, (2) site visit, (3) interviews, (4) specialized knowledge and (5) environmental liens search. Reports older than one year may not meet *the ASTM Standard Practice E1527-13* and therefore, the entire report must be updated to reflect current conditions and property-specific information

No data gaps were identified during this Phase I investigation.

2.5 Special Terms and Conditions (User Reliance)

This report is for the use and benefit of, and may be relied upon by the City of Chiloquin, as well as any of their affiliates, respective successors, and assigns, in connection with a commercial real estate transaction involving the property, and in accordance with the terms and conditions in place between Cardno and the Client for this project. Any third party agrees by accepting this report that any use or reliance on this report shall be limited by the exceptions and limitations in this report, and with the acknowledgment that actual site conditions may change with time, and that hidden conditions may exist at the property that were not discovered within the authorized scope of the assessment. Any use by or distribution of this report to third parties, without the express written consent of Cardno is at the sole risk and expense of such third party.

Cardno makes no other representation to any third party except that it has used the degree of care and skill ordinarily exercised by environmental consultants in the preparation of the report and in the assembling of data and information related thereto. No other warranties are made to any third party, either expressed or implied.

3 Site Description

3.1 Location and Legal Description

The Subject Site is comprised of two tax parcels, currently owned by the Klamath County, located at the center of downtown Chiloquin, Oregon as shown on **Figures 2 and 3**. The Subject Property is bound by a commercial facility to the north, undeveloped/vacant land to the northeast, multi-commercial facility to the east, Sky Lakes Wilderness Adventures and Klamath Tribal Courts & Child Support Enforcement Office to the southeast, the Hirvi building to the south, a former gas station to the west, and the former Union Oil Bulk Plant property to the northwest. According to the Klamath County Tax Assessor's website, the Site encompasses two parcels totaling approximately 0.55 acres. The Subject Property currently is developed with a single-story commercial building of concrete block and brick facade construction. A second building which was once occupied by the Chiloquin Mercantile that collapsed and was demolished with the exception of a vault. The associated rubble remains on-site. The building is currently vacant and in the care of Klamath County.

3.2 Surrounding Area General Characteristics

The Subject Property is located in a mixed commercial and residential use area in downtown Chiloquin, Oregon. The surrounding areas to the north, east, west, and south are commercially developed. A surrounding land use map is included as **Figure 4**.

3.3 Current Use of the Property

At the time this report was developed, the Subject Property was vacant.

Approximate Size of Property	0.55 acre
General Topography of Property	The majority of the Subject Site is relatively flat, sloping slightly west/southwest towards the Williamson River.
Adjoining and/or Ingress/Egress Roads	The ingress points for the Subject Property observed via North 1 st Avenue and West Chocktoot Street
Paved Areas	There are no paved areas on the Subject Property.
Unimproved Areas	There are no unimproved areas on the Subject Property.
Landscaped Areas	There are landscaped areas on the north portions of the Subject Property.
Surface Water	None
Potable Water Source	City of Chiloquin
Sanitary Sewer Utility	Available
Electrical Utility	Available
Natural Gas Utility	Available
Current Occupancy Status	Vacant
Unoccupied Buildings/Spaces/Structures	Vacant
Building Name or General Building Description	Former Markwardt Brothers garage and auto sales; currently vacant. The remains of an adjacent collapsed/demolished building are located to the north
Number of Floors	One with partial mezzanine/loft
Approximate Total Square Footage of Structure(s)	Former Markwardt Bros. Garage: 8,500 sq. ft. Vault: 150 sq. ft.

Construction Completion Year	Former Markwardt Bros. Garage: Pre-1931 Vault: Pre-1931
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3.4 Current Uses of Adjoining Properties

Direction from Property	Occupant(s) Name	Current Use	Potential REC(s)
South	Hirvi Building	Commercial	None
West	Former Texaco Gas Station	Commercial	HREC #1
Northwest	Vacant	Undeveloped/Vacant	None
North	Vacant	Commercial	None
Northeast	Undeveloped/Vacant	Undeveloped/Vacant	None
East	Vacant Multi-Commercial facility	Vacant Commercial	None
Southeast	Sky Lakes Wilderness Adventures	Commercial	None
Southeast	Klamath Tribal Courts & Child Support Enforcement Office	Municipal	None

4 User Provided Information

4.1 Title Records

A complete title search was not requested by the User (Client, City of Chiloquin) as part of this assessment, nor did the User provide title record information. However, according to information accessed from the Klamath County Tax Assessor, the parcels which make up the Subject Property is currently owned by Klamath County. Ownership of the property was acquired as a tax foreclosure action. No information indicated the exact date of property acquisition; however, Mr. Rick Vaughn stated Klamath County has been associated with the property for two years.

4.2 Environmental Liens or Activity and Use Limitations (AULs)

The User provided no information regarding property environmental liens or activity and use limitations (AULs). However, any liens and AULs associated with the property (if any) are anticipated to be addressed by the End User/Current Site Owner as part of the land/title transaction process.

4.3 Specialized Knowledge

The User provided no specialized knowledge regarding recognized environmental conditions associated with the property, other indicating that the site was used as an auto repair garage at one period of time, and that there may have been underground storage tanks on-site at one time.

4.4 Valuation Reduction for Environmental Issues

The User stated the building may have conducted fueling operations. However, no other information was provided regarding a significant valuation reduction for environmental issues associated with the property (**Appendix B**).

4.5 Owner, Property Manager, and Occupant Information

The Subject Property is owned by Klamath County. A copy of the AAI interview questionnaire completed by Mr. Rick Vaughn, Tax Collector and Property Manager for Klamath County, is also included in **Appendix B**.

4.6 Reason for Performing Phase I

This assessment was performed to satisfy the requirements of the Client and other interested parties with respect to potential environmental impairment associated with the property due to contamination by hazardous substances, controlled substances, or petroleum products on or near the site. The Subject Site was selected by the City of Chiloquin as a potential location for future residential or mixed-use development, or other public use.

5 Records Review

The purpose of the records review is to obtain and review records that will help identify RECs in connection with the property. Some records reviewed pertain not only to the property, but also to properties within a minimum search distance in order to assess the likelihood of potentially migrating hazardous substances or petroleum products. Unless stated otherwise, the minimum search distances used below were as specified in *ASTM Standard 1527-13*.

5.1 Standard Environmental Record Sources

The regulatory agency database radius report discussed in this section, provided by Environmental Database Resources, Inc. (EDR), was reviewed for information regarding reported use or release of hazardous substances and petroleum products on or near the property. Unless otherwise noted, the information provided by the regulatory agency database report and other sources referenced in this report, were considered sufficient to determine RECs, CRECs, HRECs, or de minimis conditions without conducting supplemental agency file reviews.

Cardno also reviewed the unlocated (orphan) site listings within the database report, cross-referencing available address information and facility names. Unlocated sites are listings that could not be plotted with confidence, but are potentially in the general area of the property, based on the partial street address, city, or zip code. Any unlocated sites within the minimum search distance from the property that was identified by Cardno through site reconnaissance and/or cross-referencing to mapped listings are included in the discussion within this section. The complete regulatory agency database report is provided in **Appendix C**. The following is a summary of the findings of the database review:

Regulatory Database	Minimum Search Distance	Subject Property Listed?	No. of Sites Listed
Federal National Priority List (NPL)	1 mile	No	0
Federal Delisted NPL (DNPL)	½ mile	No	0
Superfund Enterprise Management Systems (SEMS) formerly the Federal Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) list	½ mile	No	0
Federal Resource Conservation and Recovery Act (RCRA), Corrective Action facilities (RCRAC)	1 mile	No	0
Federal RCRIS non-CORRACTS Treatment, Storage, and Disposal Facilities (RCRAT)	½ mile	No	0
Federal RCRA Generators (RCRAGR10)	¼ mile	No	0
Federal Engineering Institutional Control Sites (EC)	Property	No	0
Federal Emergency Response Notification System (ERNSOR) list	Property	No	0
Facility Registry System (FRSOR)	Property	No	0
Enforcement and Compliance History Information (ECHOR10)	Property	No	0
RCRA NonGen/NLR (RCRANGR10)	¼ mile	No	2

Regulatory Database	Minimum Search Distance	Subject Property Listed?	No. of Sites Listed
Hazardous Materials Incident Reporting System (HMIRSR10)	Property	No	0
PCB Activity Database System (PADS)	Property	No	0
Alternative Fueling Stations (ALTFUELS)	¼ mile	No	0
State Landfill or Solid Waste Disposal Sites (LFSWDS)	½ mile	No	0
State Leaking Underground Storage Tanks (LST)	½ mile	No	3
Tribal Leaking Underground Storage Tanks (LUSTR10)	½ mile	No	0
Heating Oil Tank Incidents (HOT)	½ mile	No	0
State Registered Underground Storage Tanks (UST)	¼ mile	No	3
State Registered Aboveground Storage Tanks (AST)	¼ mile	No	2
Tribal Registered Underground/Aboveground Storage Tanks (USTR10)	¼ mile	No	0
State Institutional Control/Engineering Control Registry (ICEC)	Property	No	0
State Voluntary Cleanup Sites (VCP)	½ mile	No	3
State Brownfield Sites (Brownfield)	½ mile	No	1
State Drycleaners (Cleaners)	½ mile	No	0
State Environmental Cleanup Site Information Database (ECSI)	½ mile	No	13
HazMat/Incidents (SPILLS)	Property	No	0
Permitted Air Dischargers (AIRS)	Property	No	0
Environmental Response Program Spills (RSPILLS)	Property	No	0

Thirty-six (36) database records were noted and located within a 1-mile radius of the target area by the database search. There are fewer sites than records as a particular site may appear on more than one environmental database. Several of the listed facilities may represent a REC/CREC/HREC environmental concern due to distance, anticipated direction of groundwater flow, and/or anticipated risk of contamination. Further details regarding the Subject Property and sites listed on the Environmental Database Resources database within 0.25 mile of the Subject Property are provided below.

- **Chiloquin Texaco (HREC #1)**

Location: Northwest of the North 1st Avenue and West Chocktoot Street intersection
Located approximately 45 feet west and topographically downgradient of the Subject Property

Summary: The Chiloquin Texaco property is listed in the EDR radius report as an Underground Storage Tank (UST), Leaking Underground Storage Tank (LUST), Facility Index System/Facility Registry System (FINDS), Brownfields, and EDR Historic auto repair (EDR HIST AUTO) database. Cardno reviewed Stantec's Independent Cleanup Pathway Final Report dated April 18, 2019 of the former service station. Oregon Department of Environmental Quality (ODEQ) records indicated that four USTs were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. This facility utilized one 2,000-gallon; one 4,000-gallon; and one 6,000-gallon USTs. ODEQ records indicate that the 2,000-gallon UST was converted from storing "super" grade gasoline to storing diesel in 2003.

In July 1994, two 550-gallon gasoline USTs, one 1,000-gallon gasoline UST, and one 2,000-gallon gasoline UST were removed from the ground. Approximately 40 cubic yards of concrete and impacted soil were removed from the tank excavation. Two soil samples were collected at the bottom of the tank excavation area and detected gasoline-range hydrocarbons ranging from 28 to 860 milligrams per kilogram (mg/kg). Approximately 360 gallons of groundwater was pumped from the tank excavation into 55-gallon drums from July 13-25, 1994. Four groundwater samples were collected from the purged groundwater and submitted for benzene, toluene, ethylbenzene, and total xylenes (BTEX). The maximum BTEX constituent concentration detected was total xylenes at 15 milligrams per liter (mg/l). The property owner reported a release from the USTs to ODEQ in July 1994.

In 2017, Stantec oversaw the removal of one 6,000-gallon gasoline UST and a 6,000-gallon compound UST comprised of a 4,000-gallon gasoline UST compartment and a 2,000-gallon diesel UST compartment. Subsequently, Stantec installed six soil borings adjacent to the tank excavation area to approximately 15 feet below ground surface (ft bgs) and converted the borings to temporary groundwater monitoring wells. Soil samples were collected from the tank excavation area and from the installed soil borings. The highest TPH-Gx concentrations were detected in the southern and western excavation sidewalls ranging from 28.6 mg/kg to 4,200 mg/kg. Soil samples analyzed from soil borings detected TPH-Gx in three soil samples with concentrations ranging from 33.9 mg/kg to 2,780 mg/kg. In boring GP-1, located in the North 1st Avenue right-of-way upgradient from the UST excavation, TPH-Gx was detected at 33.9 mg/kg at 1 ft bgs. In 2018, groundwater samples were collected and TPH-Gx concentrations were below 1 mg/l with the exception of one sample where TPH-Gx was detected at 14 mg/l that was located downgradient (northwest) of the tank excavation area. Post-excavation confirmation sampling conducted in 2017, and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low.

On July 22, 2019, ODEQ granted a no further action (NFA) determination letter for the Chiloquin Texaco. Based on the issuance of an NFA, and the documented groundwater flow direction to the northwest, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Chiloquin Standard Oil Bulk Plant**

Location: Chocktoot Street
Located approximately 315 feet southwest and topographically crossgradient of the Subject Property

Summary: The facility is listed in the following EDR database records: Environmental Cleanup Site Information System (ECSI), Voluntary Cleanup Program (VCP), Brownfields, and FINDS databases. According to the Environmental Database Resources database report, this site was reportedly occupied by a series of bulk plant operators from 1984 through 2005. ODEQ records show that four gasoline USTs and one diesel UST were removed from the site in 1991. In January 2006, 38 test pits were excavated to a depth of approximately 4 ft bgs to evaluate potential impacts to soil. Soil samples from each test pit were analyzed for gasoline, diesel, and heavy oil-range petroleum hydrocarbons, volatile organic compounds (VOCs), polynuclear aromatic hydrocarbons (PAHs), and total lead. Benzene was the only constituent found in soil at concentrations exceeding applicable risk screening levels.

In 1993, four groundwater monitoring wells were installed and in September 2008, three additional wells were installed. Groundwater sampling events occurred intermittently from 1993 to 2011. Groundwater analytical data indicated no constituents were detected in groundwater above applicable ODEQ human health risk screening criteria and impacts on ecological receptors are not significant. From these seven groundwater monitoring wells, potentiometric surface data indicate groundwater flow is towards the Williamson River to the northwest.

According to the EDR radius report, ODEQ records indicate that the proposed remedial action was conducted between August and October 2012. Based on confirmation sampling and since residual contamination does not exceed acceptable risk levels, ODEQ issued an NFA determination letter on January 28, 2013. Based on the NFA issuance and groundwater flow direction, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Modoc Motors**

Location: 0 Chocktoot Street
Located approximately 425 feet northwest and topographically downgradient of the Subject Property

Summary: The facility is listed in the EDR database as an ECSI facility. According to the Environmental Database Resources database report, ODEQ added this site to the ECSI database for tracking as a former auto repair facility in August 2010. However, no violations or releases have been reported for this facility. Based on the distance, lack of documented releases, and inferred groundwater flow direction, this facility does not appear to have impacted the Subject Property.

- **Chiloquin Cleaning & Pressing (REC #4)**

Location: Southwest corner of West Chocktoot Street and South 2nd Avenue
Located approximately 115 feet southeast and topographically upgradient of the Subject Property (See **Figure 5**)

Summary: The facility is listed in the EDR database as an ECSI and FINDs facility. According to the Environmental Database Resources database report, ODEQ added this site to the ECSI database for tracking as a former dry-cleaning facility in

November 2001. No information indicated the duration of operation; however, the age of this facility pre-dates chlorinated solvents and likely handled Stoddard solvents. Based on the distance and inferred groundwater flow direction, this facility may have impacted the Subject Property.

- **Telephone Utilities of Eastern Oregon**

Location: Southwest corner of South 2nd Avenue and East Yahooskin Street
Located approximately 120 feet northeast and topographically crossgradient of the Subject Property

Summary: The facility is listed in the EDR database as an UST facility. According to the Environmental Database Resources database report, this facility utilized one UST of unknown size and contents that was reportedly decommissioned. Cardno reviewed ODEQ's list of registered tanks but information for this facility was not ascertainable. Based on the lack of reported releases and inferred groundwater flow direction, this facility it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Chiloquin Agency Lake Fire District**

Location: 156 South 2nd Avenue
Located approximately 445 feet south and topographically crossgradient of the Subject Property

Summary: The facility is listed in the EDR database as an AST and Hazardous Substance Information Survey (HSIS) facility. According to the Environmental Database Resources database report, this facility utilizes one AST cylinder of nitrogen of unknown size. However, there are reported releases or violations. Based on the lack of reported releases, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Tony Reyes**

Location: 123 South 3rd Street
Located approximately 450 feet south and topographically crossgradient of the Subject Property

Summary: The facility is listed in the EDR database as a Resource Conservation and Recovery Act – Non-Generator / No Longer Regulated (RCRA NonGen/NLR) facility. According to the Environmental Database Resources database report, this facility is no longer a RCRA generator and no other information is provided. Based on the lack of reported releases, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Klamath County School District**

Location: 131 South 3rd Street
Located approximately 615 feet southeast and topographically crossgradient of the Subject Property

Summary: The facility is listed in the EDR database as an AST and Hazardous Substance Information Survey (HSIS) facility. According to the Environmental Database Resources database report, this facility utilizes one AST of propane of unknown size. However, there are reported releases or violations. Based on the lack of reported releases, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Wampler Logging**

Location: 212 North Klamath Avenue
Located approximately 620 feet northwest and topographically downgradient of the Subject Property

Summary: The facility is listed in the EDR database as an ECSI and FINDs facility. According to the Environmental Database Resources database report, ODEQ added this site to the ECSI database for tracking as an active logging facility in November 2006. Additionally, Environmental Database Resources database reports this facility is no longer a RCRA generator and no other information is provided. Based on the lack of reported releases, this facility does not appear to have impacted the Subject Property. Based on the distance and inferred groundwater flow direction, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Chocktoot Street Petroleum Releases**

Location: 0 Chocktoot Street (East of bridge)
Located approximately 785 feet northwest and topographically downgradient of the Subject Property

Summary: The facility is listed in the EDR database as an ECSI facility. According to the Environmental Database Resources database report, ODEQ discovered petroleum contamination while sampling for a street project in August 2010. However, based on distance and assumed groundwater flow direction, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

- **Clyde's Fairway Market**

Location: 323 Chocktoot Street
Located approximately 1,170 feet northwest and topographically downgradient of the Subject Property

Summary: The facility is listed in the EDR database as an ECSI facility. According to the Environmental Database Resources database report, ODEQ added this site to the ECSI database for tracking as a former service station facility in March 2004. However, based on distance and groundwater flow direction, it is not likely that this facility has impacted the environmental integrity of the Subject Property.

Additional sites were identified between 0.25 and ½ mile in the Environmental Database Resources database records search. However, based upon distance, intervening topographic gradient, proximity to the river, and regulatory information provided, these facilities are not considered potential environmental concerns with respect to the Subject Site. Based on a review of the database and windshield survey of the area there are no off-site RECs associated with the property.

5.2 Physical Setting Sources

An EDR Physical Setting Map report is included in **Appendix C**. According to this report, surficial soil at the Site is Lobert sandy loam. Additionally, the Site is underlain by Pliocene fluvial sedimentary deposits.

The Site is located on the Chiloquin, OR 2014 USGS 7.5-minute series topographic map. The topography at the Subject Property slopes gently to the west. Elevation at the Site is approximately 4,195 – 4,200 feet above mean sea level (MSL). Based on the mapped topography of the site, the

inferred primary direction of groundwater flow for the vicinity of the Subject Site is anticipated to be generally northwest towards the Williamson River. However, it is feasible that localized variations in ground water flow may exist, and a site-specific determination would be required to verify ground water flow direction.

5.3 Historical Records Sources

5.3.1 Aerial Photographs, Topographic Maps, and Sanborn Fire Insurance Maps

The objective of consulting historical sources is to determine the likelihood of past uses having led to recognized environmental conditions in connection with the Subject Site. A review was conducted of historical aerial photographs (**Appendix D**) and topographic maps (**Appendix E**) obtained from Environmental Database Resources.

Additionally, Sanborn Fire Insurance Maps (FIMs) have been produced since the late 1800s to provide information relative to fire hazards on insurable property. These maps often indicate locations of underground and aboveground gasoline tanks, storage facilities for flammable and hazardous chemicals, such as dry cleaners, paint shops, maintenance and garage facilities, as well as historical information on occupants of buildings, unavailable through other sources. Production of these maps typically was limited to the immediate vicinity of downtown urban areas. The detailed EDR Sanborn FIMs report is included in **Appendix F**. Findings of review of the historical Sanborn Fire Insurance Maps are chronologically summarized in the following table.

Findings of review of the historical aerial photos, topographic maps, and Sanborn FIMs are chronologically summarized in the following table:

Period	Source(s)	Identified Historical Uses		Comments
		Subject Property	Surrounding Area	
1931	Sanborn FIM (Figure 5)	A large auto repair/garage building is depicted on the Subject Property. An area at the southwest corner within the auto repair building is labeled “Gas & Oil”. A building addition is connected to the auto repair building to the north. Additionally, a building is depicted on the northern portion and labeled “Rooms” on the Subject Property.	A Printing facility is located to the east. A Cleaning facility is located to the southeast. The S.P.CO. Railroad is located west of the Subject Property. A Shell Oil Co. facility with one steel oil tank and oil warehouse is located to the west. An auto repair garage is located to the southwest.	The “Gas & Oil” (REC #1) and auto repair/garage (REC #2) at the on-site building are RECs. The Printing facility (REC # 4) and the Cleaning facility (REC #5) are considered RECs based on the review of the Sanborn Map.
1953	Aerial Photograph	A commercial building appears on the Subject Property.	Commercial buildings are to the south and west. Residential buildings are in the surrounding area. A railroad and river appear to the west.	No additional RECs noted.

Period	Source(s)	Identified Historical Uses		Comments
		Subject Property	Surrounding Area	
1955	Aerial Photograph	Blurry; similar to previous aerial photograph.	Blurry; similar to previous aerial photograph.	No additional RECs noted.
1957	Topographic Map	A building is depicted on the Subject Property	Several commercial buildings and residential dwellings appear in the surrounding area. A railroad and river appear to the west. A water tower is located to the east.	No additional RECs noted.
1975	Aerial Photograph	Similar to previous aerial photograph.	Several commercial buildings appear to have been removed to the southeast. A commercial building appears at the north adjoining property.	No additional RECs noted.
1982	Aerial Photograph	Similar to previous aerial photograph.	Additional commercial development appears to the south.	No additional RECs noted
1994	Aerial Photograph	Similar to previous aerial photograph.	Additional commercial development appears to the northeast and east. A gas station appears to the west.	The off-site gas station is a HREC (HREC #1)
1998	Topographic Map	Similar to previous aerial photograph.	More residential and commercial structures in the surrounding area. The Chiloquin Airfield is depicted to the west.	No additional RECs noted.
2000	Aerial Photograph	Similar to previous aerial photograph.	Additional commercial development appears to the west.	No additional RECs noted.
2006	Aerial Photograph	Similar to previous aerial photograph.	Additional commercial development appears in the surrounding area.	No additional RECs noted.
2009	Aerial Photograph	Similar to previous aerial photograph.	Land clearing is visible to the northeast and south.	No additional RECs noted.
2012	Aerial Photograph	Similar to previous aerial photograph.	Similar to previous aerial photograph.	No additional RECs noted.
2014	Aerial Photograph	Similar to previous topographic map. The on-site structure is depicted.	Similar to previous topographic map. No structures are depicted on the map.	No additional RECs noted.
2016	Aerial Photograph	Similar to previous aerial photograph.	Similar to previous aerial photograph.	No additional RECs noted.

Note: Text in **bold** are environmental concerns and are further discussed below.

REC#1: According to the 1931 Sanborn FIM (**Figure 5**), the building is an auto repair/garage and an area within the on-site building, at the southwest corner, is labeled “Gas & Oil”. Therefore, there is

potential for a UST(s) to exist on the property and said tank may have impacted the soil, groundwater, and/or vapor at the Subject Property.

REC #2: The on-site building operated as an auto repair facility from the 1930s to the 1960s. This time-frame predates the regulations of storage/disposal of hazardous substances such as used oil and other non-regulated automobile chemicals. Therefore, there is potential for release of hazardous materials in the soil and groundwater at the Subject Property.

REC #4: According to the 1931 Sanborn FIM (**Figure 5**), a Printing facility is located approximately 80 feet to the east. The length of operation for this facility is unknown. There is potential for a release from this facility.

REC #5: According to the 1931 Sanborn FIM (**Figure 5**), a Cleaning facility is located approximately 120 feet to the southeast. The length of operation for this facility is unknown. There is a potential for a release from this facility.

HREC #1: According to Oregon Department of Environmental Quality (ODEQ) records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989, predates UST registration, and were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. Soil and groundwater samples were collected from within and adjacent to the tank excavation area. Analytical results indicated BTEX constituent concentrations were above applicable risk screening levels. However, post-excavation confirmation sampling conducted in 2017 and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low. On July 22, 2019, ODEQ granted an NFA determination letter for the Chiloquin Texaco. Based on the issuance of an NFA, this facility is considered a historical REC. See Section 5.1 for further details.

5.3.2 City Directories

Historical City directories are generally referenced for study areas to help identify changes in land use based on the type of businesses that occupied the Subject Site and surrounding area. The type of business, such as automotive, dry cleaning, gasoline/service stations, etc. are indicative of the possible presence of hazardous substances or petroleum products. The detailed City Directories reports are included in **Appendix G**. No Historical City Directories were available for the Subject Property and surrounding area prior to 1992.

Period	City Directory Identified Historical Uses		Comments
	Subject Property	Surrounding Area	
1992	No Listing	E. Yahooskin St.: Residential N. 1 st Ave.: Residential	No RECs noted.
1995	No Listing	119 E. Yahooskin St.: Chiloquin Head Start 220 W. Chocktoot St.: Paul's Automotive Service 119 W. Chocktoot St.: Beas Antiques & Refinishing 323 W. Chocktoot St.: Clyde's Fairway Market	No RECs noted.
2000	No Listing	210 S. 1 st Ave.: Chiloquin Alternative Education Center 216 S. 1 st Ave.: Chiloquin Branch Library 219 N. 1 st Ave.: Chiloquin Awareness Committee Hoops Activity Center	No RECs noted.
2005	No Listing	228 S. 1 st Ave.: United States Postal Service	No RECs noted.

Period	City Directory Identified Historical Uses		Comments
	Subject Property	Surrounding Area	
2010	No Listing	S. 1 st Ave.: Chiloquin Community Correction 414 W. Chocktoot St.: Oregon Reflections	No RECs noted.
2014	No Listing	118 W. Chocktoot St.: Klamath Tribal Court 201 W. Chocktoot St.: Chiloquin Shell & Food Mart 323 W. Chocktoot St.: Clyde's Fairway Market 127 S. 1 st Ave.: Chiloquin Agency Lake Fire District 228 S. 1 st Ave.: United States Government 221 N. 1 st Ave.: Klamath Water Commission 119 E. Yahooskin St.: Head Start Klamath Tribes	The Chiloquin Shell & Food Mart is a HREC (HREC #1).
2017	No Listing	119 E. Yahooskin St.: Klamath Tribes 221 N. 1 st Ave.: Klamath Water Commission 323 W. Chocktoot St.: Fairway Market 127 S. 1 st Ave.: Chiloquin Agency Lake Fire District 140 S. 1 st Ave.: Community Correction Chiloquin Office	No additional RECs noted

Note: Text in **bold** are environmental concerns and are further discussed below.

HREC #1: According to Oregon Department of Environmental Quality (ODEQ) records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989, predates UST registration, and were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. Soil and groundwater samples were collected from within and adjacent to the tank excavation area. Analytical results indicated BTEX constituent concentrations were above applicable risk screening levels. However, post-excavation confirmation sampling conducted in 2017 and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low. On July 22, 2019, ODEQ granted an NFA determination letter for the Chiloquin Texaco. Based on the issuance of an NFA, this facility is considered a historical REC. See Section 5.1 for further details.

5.3.3 Prior Reports

No prior environmental reports were provided for review.

6 Site Reconnaissance

The following is a summary of visual and/or physical observations of the property on the day of the site visit. As stated, the site is comprised one on-site building, building debris remnants of a former building, a vault, and vacant/undeveloped portion of the Subject Property. Representative photographs can be found in **Appendix A**.

6.1 Methodology and Limiting Conditions

Mr. Keith Ziobron, P.E. and Mr. Ashton Smithwick with Cardno conducted the site reconnaissance on April 13 2021. The site reconnaissance consisted of visual and/or physical observations of the property and improvements; adjoining sites as viewed from the property; and, the surrounding area based on visual observations made during the trip to and from the property.

No other limiting conditions were identified during the site reconnaissance, and all exterior and interior areas were inspected.

6.2 Hazardous Substance Use, Storage, and Disposal

Cardno did not observe any substance use, storage, or disposal at the Subject Property. However, between approximately 1930 to the 1960s, this facility was occupied by an auto repair garage and this time-frame predates regulations set forth by state regulations of the disposal of hazardous substances and other non-regulated chemicals. Therefore, improper storage and disposal practices may have occurred on the Subject Property (**REC #2**).

6.3 Underground Storage Tanks (USTs)

Cardno did not observe any USTs. However, Cardno identified a vent pipe attached to the west exterior wall of the on-site building (**REC #1**). Cardno believes this to be a ventilation pipe for an UST(s) on the Subject Property (See Photo 9). According to the 1931 Sanborn FIM, there is an area within the southwest corner labeled "Gas & Oil" which could be an indication for an on-site UST(s). Further, Cardno observed a potential vent pipe along the interior of the east wall. This vent pipe is a potential indicator for an on-site buried UST or heating oil tank (**REC #3**).

6.4 Aboveground Storage Tanks (ASTs)

Cardno did not observe any ASTs.

6.5 Other Petroleum Products

Cardno did not observe any other petroleum products.

6.6 Polychlorinated Biphenyls (PCBs)

Cardno observed the remains of three in-ground hydraulic lifts and one oil-changing pit within the on-site building (**REC #2**). No other information was provided regarding the lifts or oil-changing pit. Based on its potential to contain PCBs and/or other hydraulic fluids, it has potential to impact the soil, groundwater, and/or vapor at the Subject Property.

6.7 Unidentified Substance Containers

Cardno did not observe any unidentified substance containers.

6.8 Nonhazardous Solid Waste

Cardno observed a significant pile of wood chips within the on-site building. According to Mr. Charlie Case of the City of Chiloquin Public Works Department, the on-site building was utilized prior to 2000 for manufacturing wooden boxes and wood smoking chips for grills/barbeques. The leftover wooden chips are the remains of the Juniper wood products business.

Additionally, significant quantities of building debris are located along the north exterior wall from the previous building attachment. These materials have potential for asbestos-containing materials (ACM) and lead-based paint (LBP). Cardno estimates there is approximately 650 cubic yards of building debris that remains on the Subject Property. See Photos 2 for a general representation of site conditions.

6.9 Wastewater

Cardno did not observe evidence of wastewater generation at the Subject Property.

6.10 Waste Pits, Ponds and Lagoons

Cardno did not observe any pits, ponds, or lagoons on the Subject Property.

6.11 Drains and Sumps

Cardno did not observe any drains or sumps on the Subject Property.

6.12 Septic Systems

Cardno did not observe evidence of septic tank usage on the Subject Property.

6.13 Storm Water Management System

Cardno observed a stormwater drain near the southeast corner of the on-site building on West Chocktoot Street.

6.14 Wells

Cardno did not observe any monitoring or active drinking wells on the Subject Property.

7 Subsurface Vapor Migration

Hazardous gases (vapor) from subsurface sources, such as contaminated soil or groundwater can migrate into residential, commercial, and industrial buildings with any foundation type, including basements, crawlspaces, or slabs. According to EPA guidance, three conditions must exist for hazardous vapors to reach the interior of buildings from the subsurface environment underneath or near a building. First, a source of hazardous vapors must be present in the soil or in groundwater underneath or near a building. Second, vapors must form and have a pathway along which to migrate toward the building. Third, entry routes must exist for the vapors to enter the building, and driving forces must exist to draw the vapors into the building.

Cardno considered the nature and extent of on-site sources of potential subsurface vapor migration by evaluating the current and historical usage of the property, the construction type and history, the physical setting, and the potential sources of subsurface vapor migration through the review of regulatory agency database information that was summarized in Section 5.0.

Based on the evaluation of the known or suspected releases of hazardous substances or petroleum products, their distance from the property, all potential pathways separated by roads with underground utilities, and soil type, et al, are not determined to impact the Subject Property with the exception of the following:

- **REC#1** – Former on-site automobile fueling;
- **REC #2** – On-site auto repair garage operations;
- **REC #3** – Potential on-site UST or heating oil tank
- **REC #4** – Off-site printing; and
- **REC #5** – Off-site dry-cleaning

8 Interviews

Cardno obtained completed interview questionnaire from the following persons:

- Rick Vaughn – Tax Collector and Property Manager for Klamath County
- Teresa R. Foreman – City Recorder for the City of Chiloquin
- Charlie Case – City of Chiloquin Public Works
- Fire Chief Michael Cook – Chiloquin Fire & Rescue

The completed All Appropriate Inquiry questionnaires, completed by Mr. Rick Vaughn and Ms. Teresa R. Foreman, are provided in **Appendix B**.

Ms. Teresa Foreman stated there is no purchase price for the property and is owned by Klamath County through tax foreclosure. Ms. Foreman indicated the on-site building was formerly utilized as a car dealership and garage. She also stated she assumes fuel and oil were stored and used as part of the business.

Mr. Rick Vaughn has been associated with the Subject Property for approximately two years. Mr. Vaughn states the property is approximately 0.51-acres and he believes the on-site building is approximately 12,316 sq. ft. He is not aware of the past uses of the property and that Klamath County obtained the property through tax foreclosure.

Mr. Charlie Case indicated the former Markwardt Brothers Garage was in operation from approximately the 1930s to the 1960s; a second-hand store in the 1970s; and Juniper wood products in the 1980s. Mr. Case stated the remains of the wood chips within the on-site building are from the Juniper wood products company that manufactured wooden boxes and wood chips for grills/barbeques. Mr. Case stated the southwest corner of the on-site building was utilized as a fueling stations between the 1930s to the 1950s. He also mentioned the roof of the former building attachment north of the on-site building had completely collapsed and the remainder of the building was demolished around 2015.

Cardno contacted Fire Chief Michael Cook of the Chiloquin Fire & Rescue Department in regards to any fires, spills, and/or incidents. Chief Cook stated there are no records on file for the Subject Property.

9 Additional Scope Items

During the course of this investigation, Cardno completed a comprehensive asbestos inspection on the former Markwardt Brothers Garage as depicted in **Figures 2-3**. A copy of this report will be provided under a separate cover and is included as **Appendix H**.

No other collection or investigation for the purpose of determining the possible presence of radon, mold, and/or any other potential contaminants requiring specialized testing procedures or sampling were conducted during this investigation. No assessment was conducted for the possible presence or absence of wetlands and no determination is offered with regard to the suitability of the subject site for development or for any other specific use or purpose.

Notwithstanding these limitations, the applicability of certain environmental issues which are not covered by ASTM standards are still germane to a wide array of properties. The following is a summary of non-scope issues identified at the property on the day of the site visit.

9.1 Asbestos Containing Materials

The inspection was performed on April 13, 2021 by Mr. Ashton Smithwick, an EPA accredited asbestos inspector, in accordance with the Asbestos Hazardous Emergency Response Act (AHERA) and Asbestos School Hazard Abatement Reauthorization Act (ASHARA).

In accordance with National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61 Subpart M, paragraph 145, all asbestos containing materials (ACMs) must be identified and removed prior to disturbance, either during a renovation or demolition. ACM is defined by OSHA as materials that contain greater than 1% asbestos fibers.

The asbestos inspection included a visual inspection of all accessible interior and exterior areas of the on-site buildings. This inspection was performed in accordance with AHERA and ASHARA protocols. Cardno made a reasonable attempt to visually identify all suspect materials or homogeneous areas (HAs). The interior and exterior of the buildings were identified, with the exception of the building roof due to the overall unsafe condition. Each HA was visually assessed for condition, friability, and quantity.

During the inspection, Cardno collected twenty-three (23) samples from eight (8) different HAs throughout interior/exterior of the on-site facility. All bulk samples were collected and stored in appropriate sample containers, labeled, and delivered to Eurofins EMLab P&K (EMLab) in Norcross, Georgia. AES analyzed the samples using Polarized Light Microscopy (PLM) via EPA Method 600/R-93/116. This laboratory is accredited by the National Institute of Standards of Technology (NIST), and is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP).

9.1.1 Asbestos Results

The following materials were identified as containing greater than 1% ACM:

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-site building.
- Interior white texture and joint compound on drywall, totaling approximately 1000 SF, located within the western most portions of the on-site building.

- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

The following materials were not sampled and should be considered PACM:

- Exterior building debris from former attached north addition, totaling approximately 650 CY.

The north building addition was constructed around the same time as the main building, and the building debris appeared to have suspect materials. Therefore, the building debris should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

A more detailed summary of the inspection, identified ACM, and diagrams of samples and ACM locations will be provided under separate cover and is included as **Appendix H**. Photos of the identified ACM are included as **Appendix A**.

9.2 Lead-Based Paint

A limited lead-based paint (LBP) inspection was conducted on April 13, 2021 by Cardno's Mr. Ashton Smithwick. All testing was completed in accordance with applicable HUD, state, and federal regulations regarding LBP inspections. No previous LBP sampling information was provided by the client or the property owner.

The LBP testing was performed in general accordance with the inspection protocol in Chapter 7 of the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. Painted surfaces were tested by collected paint chips of various painted surfaces throughout the interior and exterior of the buildings. LBP is defined by EPA as containing greater than 0.5% lead in painted materials.

During the inspection, Cardno collected 12 paint chips samples from unique locations throughout the interior/exterior of the on-site buildings.

The paint chip samples were collected into appropriate containers, labeled, and delivered to EMLab in Norcross, Georgia. The laboratory analyzed the samples using flame atomic absorption spectrometry (FAAS) via National Institute for Occupational Safety and Health (NIOSH) Method 7082. This laboratory is accredited by the NIST program, and is recognized under the NVLAP. A copy of the analytical results included the laboratory certification will be provided under a separate cover.

9.2.1 Lead-based Paint Results

In accordance with EPA, any paint containing 0.5% by weight of lead is categorized as containing lead. Based on the paint chip sampling results, the following painted surface tested positive for lead-based paint:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.
- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

A more detailed summary of the inspection, identified LBP, and diagrams of sample LBP locations will be provided under a separate cover and included as **Appendix H**. Photos of the identified LPB is included as **Appendix A**.

9.3 Additional Non-ASTM Considerations

No other collection or any investigation for the purpose of determining the possible presence of radon, mold, and/or any other potential contaminants requiring specialized testing procedures or sampling were conducted during this investigation. No assessment was conducted for the possible presence or absence of wetlands and no determination is offered with regard to the suitability of the subject site for development or for any other specific use or purpose.

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10 Findings and Recommendations

Cardno has completed a Phase I Environmental Site Assessment (ESA) of the former Markwardt Brothers Garage property located northeast of the North 1st Avenue and West Chocktoot intersection in downtown Chiloquin, Klamath County, Oregon (**Figure 1**). The property boundary is shown on **Figure 2** and the tax parcel map is provided in **Figure 3**.

Photos of the Subject Property and surrounding properties taken during the site visit are provided in **Appendix A**. The surrounding land use map is provided as **Figure 4**. This assessment was performed under and funded by the City of Chiloquin Business of Oregon Brownfield Grant in general accordance with *40 CFR Part 312 Standards and Practices for All Appropriate Inquiries* and *ASTM Standard Practices E1527-13 for Environmental Site Assessments*.

This assessment was performed to satisfy the requirements of City of Chiloquin (Client) with respect to potential environmental impairment and liabilities associated with the property due to contamination by hazardous substances, controlled substances, or petroleum products on or near the site.

10.1 Findings

Phase I ESA investigations seek to identify known or suspect RECs, HRECs, CRECs, and de minimis conditions. De minimis conditions are those that are judged to not present a material risk of harm to health or the environment.

This assessment has identified several RECs in connection with the Subject Property, as shown in **Figure 5**, consisting of the following:

On-Site REC

1. According to the 1931 Sanborn FIM, the building was used as an auto repair garage and an area with-in the on-site building, at the southwest corner, is labeled "Gas & Oil". Further, during site reconnaissance, Cardno personnel identified a potential UST vent pipe attached to the west interior wall of the on-site building. Therefore, there is potential for a UST(s) to exist on the property and said tank may have impacted the soil, groundwater, and/or vapor at the Subject Property.
2. The remains of three in-ground hydraulic lifts and one oil-changing pit were observed in the building. According to the 1931 Sanborn Fire Insurance Map (FIM), the on-site building is labeled as being an auto repair/garage facility. Additionally, based on the age of the building, this time-frame predates the regulation of the storage/disposal of hazardous substances such as used oil and other non-regulated automobile chemicals. Based on the age and duration of use, the in-ground lifts and unknown chemical management and disposal practices associated with historic operations, site soil, groundwater, and/or vapor may have been impacted by historic site operations.
3. During site reconnaissance, Cardno identified a potential vent pipe in the interior of the building along the eastern wall. This could be an indication for a UST and/or heating oil tank to exist on the Subject Property. Based on the age and duration of the former use of the building, there is potential for a UST/heating oil tank on the property that may have impacted the soil, groundwater, and/or vapor at the Subject Property.

Off-Site RECs

4. According to the 1931 Sanborn FIM, a Printing facility is located approximately 80 feet to the east. The length of operation for this facility is unknown. There is potential for a release from this facility.

5. According to the 1931 Sanborn FIM, a Cleaning facility is located approximately 120 feet to the southeast. The length of operation for this facility is unknown. There is a potential for a release from this facility.

Off-site HRECs

1. According to Oregon Department of Environmental Quality (ODEQ) records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989 which predates UST registration. These tanks were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. The new tanks were subsequently removed in 2017. Post-excavation confirmation sampling conducted in 2017 and soil sampling conducted in June 2018 indicate that the residual petroleum in soil are low. On July 22, 2019, ODEQ granted an NFA determination letter for the Chiloquin Texaco site. Based on the issuance of an NFA, and given the assumed ground waterflow direction away from the subject site, this facility is considered a historical REC.

Asbestos-Containing Materials

Asbestos containing materials (ACMs) were identified throughout the interior of the building including:

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-site building.
- Interior white texture and joint compound on drywall, totaling approximately 1000 SF, located within the western most portions of the on-site building.
- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

Overall, given the state of the buildings, most of these materials were in good to fair condition. Therefore, the identified ACM has a low probability of disturbance during ordinary use. Prior to any renovation or demolition that may cause the ACM to become friable, the material should be removed or abated by a qualified asbestos abatement contractor. A more detailed summary of the inspection, identified ACM, and diagram of samples and ACM location will be provided under a separate cover and included as **Appendix H**.

The following suspect building materials were not sampled and should be considered presumed asbestos containing materials (PACM):

- Exterior building debris from former attached north addition, totaling approximately 650 cubic yards (CY).

The building to the north was constructed around the same time as the remaining building, and the building debris appeared to have suspect materials. Therefore, the building debris/rubble should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

Lead-Based Paint

Lead-based paint (LBP) was identified on various painted surfaces throughout the interior and exterior of the building in various tenant spaces including:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.

- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

Most of the identified painted surfaces were in poor condition, with peeling and deterioration noted. As the buildings are not considered to be child-occupied facilities, the identified LBP can be left intact unless disturbed during renovation or demolition. A more detailed summary of the inspection, identified LBP, and diagram of samples and LBP locations will be provided under a separate cover and included as **Appendix H**.

10.2 Recommendations

Cardno makes the following recommendations:

- A geophysical survey should be performed in the vicinity of the vent pipes in order to determine if USTs are present. If they are found to be present, soil and ground water sampling should be performed adjacent to the tanks.
- Soil boings or test pits should install and soil samples collected and analyzed to evaluate impacts from the identified on and off-site RECs.
- A limited ground water monitoring network should be installed and sampled to evaluate potential ground water impacts and the potential for vapor intrusion.
- The exterior building debris/rubble should be considered PACM and treated as ACM until further sampling by a licensed asbestos inspector indicates otherwise. In addition to ACM testing, the debris should be characterized relate to the potential presence of toxic levels of lead. Finally, After the debris is removed, the need for additional site characterization should be considered.
- Prior to any renovation or demolition that may cause the ACM to become friable, the material should be removed or abated by a qualified asbestos abatement contractor. If the ACM is to be left in place, an Operation and Maintenance (O&M) plan should be implemented regarding the handling of the identified ACM.
- The identified lead-based paint appeared to be overall in fair to poor condition. The on-site building is not considered a child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition. If the LBP is to be disturbed during renovation or demolition, depending on the extent of the disturbance, the LBP can be encapsulated, enclosed, or abated. All activity that disturbs LBP should be conducted by a licensed LBP renovation, repair, or paint (RRP) firm or a qualified LBP abatement contractor.

If the property is to be renovated or demolished, due to the presence of lead on various painted surfaces, toxicity characteristic leachate procedure (TCLP) analysis for lead should be conducted on any construction debris to determine if the material should be characterized as a hazardous waste prior to disposal.

11 References

EDR. *Radius Report*, Order Number 6438323.2s

EDR. *Aerial Photo Decade Package*, Order Number 6438323.8

EDR. *City Directories*, Order Number 6438323.5

EDR. *Historical Topographic Maps*, Order Number 6438323.4

EDR. *Sanborn Fire Insurance Maps*, Order Number 6438323.3

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12 Qualifications/Signatures of Environmental Professional(s)

I declare that, to the best of my professional knowledge and belief, I meet the definition of Environmental Professional as defined in 40 CFR Part 312.10. I certify that this report has been prepared in general accordance with 40 CFR Part 312 and ASTM E 1527-13 Standard Practice for Environmental Site Assessments.

I further certify that, in my professional judgment, this report meets the requirements of 40 CFR Part 312, Standards and Practices for All Appropriate Inquiries. I have the specific qualifications based on training, experience and registration to perform and/or assist in the assessment of a property of the nature, history and setting of the Subject Property.

for Cardno



Keith Ziobron, P.E.
Branch Manager

Date: May 17, 2020

I declare this "*Phase I Environmental Site Assessment*" Report meets or exceeds Cardno's standards for editorial content, technical accuracy, and quality assurance verification. All data and calculations presented herein have been checked for accuracy and the basis for all conclusions and recommendations have been described.

for Cardno



W. Ashton Smithwick
Geologist I

Date: May 17, 2021

Asbestos & Lead-Based Paint Survey

Former Markwardt Brothers Garage
North 1st Avenue and West Chocktoot Street
Chiloquin, Klamath County, Oregon

May 17, 2021

Prepared for:
City of Chiloquin, Oregon



Asbestos & Lead-Based Paint Survey Report

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City of Chiloquin, Oregon
127 South 1st Avenue
Chiloquin, Oregon 97624

Project Name: **Asbestos & Lead-Based Paint Survey**
Former Markwardt Brothers Garage
North 1st Avenue and West Chocktoot Street
Chiloquin, Klamath County, Oregon

Cardno Project #: CHILOQ100

Date: May 17, 2021

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Executive Summary

Cardno has completed a comprehensive Asbestos and limited Lead-Based Paint survey of the former Markwardt Brothers Garage located northeast of the North 1st Avenue and West Chocktoot Street intersection in Chiloquin, Oregon. The study property is herein referred to as "the Subject Site/Property" or "the Site" (as generally depicted in **Figures 1 and 2**) and consists of approximately 0.55-acres developed with one commercial structure. The Subject Property and its on-site structure are currently owned by Klamath County. The Subject Site is currently being evaluated for redevelopment.

The Subject Property is located in the downtown area of Chiloquin, Oregon. Historically, the surrounding area has been commercially and residentially developed since the 1920s. The Subject Property is bordered to the north by a commercial property; to the east and south by additional commercial properties; and to the west by a former gas station.

This assessment was performed to satisfy the requirements of the Client (City of Chiloquin) and their assigns (including the prospective purchaser) with respect to potential environmental impairment and liabilities associated with the property due to contamination by hazardous substances. This assessment was completed under the City of Chiloquin's Business of Oregon Brownfield Grant for the site.

In summary, the results of this survey are stated below.

Asbestos: Comparison of the laboratory analytical results to the Occupational Safety and Health Administration's (OSHA) for building materials containing >1% asbestos revealed:

- Interior white skim coat on plaster surfacing, totaling approximately 3,700 square feet (SF), located within the western most portions of the on-site building.
- Interior white texture and joint compound on drywall, totaling approximately 1000 SF, located within the western most portions of the on-site building.
- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

For the purposes of demolition, the ACMs identified during this inspection are considered RACM (regulated ACM). RACM consists of friable ACM, Category I non-friable ACM that has become friable, Category I non-friable ACM that is subjected to sanding, grinding, cutting or abrading, or Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material in the course of demolition or renovation operations.

The following suspect building materials were not sampled and should be considered presumed asbestos containing materials (PACM):

- Exterior building debris from former attached north addition, totaling approximately 650 cubic yards (CY).

The north building addition was constructed around the same time as the main building, and the building debris appeared to have suspect materials. Therefore, the building debris should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

Lead-Based Paint: Comparison of the laboratory analytical results to the Environmental Protection Agency (EPA) and Housing and Urban Development (HUD) for paint chips identified the following materials as lead-based paint:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.
- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

Based on the results of the Phase II ESA, Cardno recommends:

- The identified ACMs appears to be in good to fair condition. Prior to any renovation or demolition that may cause the ACM to become friable, these materials should be removed or abated by a qualified asbestos abatement contractor in compliance with federal, state, and local regulations. If the ACM is to be left in place, an Operation and Maintenance (O&M) plan should be implemented regarding the handling of the identified ACM.
- The exterior building debris should be considered PACM and treated as ACM until further sampling by a licensed asbestos inspector indicates otherwise.
- The identified lead-based paint appeared to be overall in good to fair condition. The building is not considered a child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition.
- For the purposes of demolition or renovation, if the paint is well adhered to the substrate and will not be cut, sanded, or abraded by mechanical means for sizing than it can be disposed of along with the construction and demolition debris. Loose and flaking lead-containing paint should be removed and containerized as a waste stream for disposal purposes. Once all of the paint materials are collected for disposal, a waste profile sample should be collected to determine if the waste is hazardous. Hazardous materials must be properly containerized, transported, and disposed of in accordance with Resource Conservation Recovery Act (RCRA) standards and regulations.

1 Introduction

1.1 Purpose

This assessment was completed under the City of Chiloquin's Business of Oregon Brownfield Grant for the subject property. The Client (City of Chiloquin) intends to either renovate or demolish the building.

1.2 Site History

The Subject Site historically was identified as the Markwardt Brothers Garage from the 1930s to the 1960s; a second-hand store in the 1970s; and Juniper wood products processing facility in the 1980s. According to the Public Works Department, the building has been vacant since the late 1990s. A building attachment formerly occupied the property north of the on-site building. However, the roof of the former building collapsed and the remainder of the building was demolished in 2015. The northern portion of the property was developed with one structure in the 1930s but was razed and vacant since.

1.3 Property Descriptions

The Subject Site is comprised of one parcel, currently owned by the Klamath County, located in the center of downtown Chiloquin, Oregon as shown on **Figures 2 and 3**. The Subject Property is bound by an auto repair facility to the north, undeveloped/vacant land to the northeast, multi-commercial facilities to the east, Sky Lakes Wilderness Adventures and Klamath Tribal Courts & Child Support Enforcement Office to the southeast, the Hirvi building to the south, a former gas station to the west, and the former Union Oil Bulk Plant property to the northwest.

According to the Klamath County Tax Assessor's website, the Site encompasses two parcels totaling approximately 0.55 acres. The Subject Property currently is developed with a single-story commercial building of concrete block and brick facade construction. A former building addition has been previously demolished and the remains of the building materials remain with the exception of a vault. The building is currently vacant and in the care of Klamath County.

1.4 Building Description

During the asbestos and LBP survey, Cardno noted the construction materials utilized for the interior/exterior of the on-site building. The exterior walls of the building were concrete masonry units (CMU) with brick façade and the roof appears to be newly renovated thick plastic over wooden trusses.

The interior walls throughout the building consisted of a combination of CMU and CMU overlain with drywall and/or plaster/stucco. Throughout the interior of the building the floor consists of bare concrete slab. No basement or crawlspace was observed during the survey.

1.5 Previous Assessments

Cardno is also completing a Phase I ESA in concert with this asbestos and lead-based paint survey. This Phase I ESA investigation identified a potential UST(s), auto repair/garage uses, potential mishandling/disposal of chemicals on the Subject Property as well as a Recognized Environmental conditions (RECs) associated with former off-site printing and dry-cleaning facilities. The Phase I ESA report will be submitted to the client under separate cover. However, no prior environmental reports were provided for review.

1.6 Limitations / Exceptions of Assessment

A comprehensive asbestos and limited LBP survey was completed by Cardno to identify potential ACM and LBP. Any suspect building materials not sampled and analyzed for asbestos during this investigation should be treated as presumed asbestos containing materials (PACM) until further sampling by a certified inspector indicates otherwise. Any suspect LBP not sampled and analyzed for lead during this investigation should be treated as LBP until further sampling by a certified inspector indicates otherwise. Further, it should be noted that the collection and analysis of roofing materials was not included in the scope of this project.

No other warranty is expressed or implied.

1.7 Special Terms and Conditions (User Reliance)

This report is for the use and benefit of, and may be relied upon by the entity(s) identified in the Executive Summary of this report as the Client, as well as any of its affiliates and their respective successors and assigns, in connection with a commercial real estate transaction involving the property, and in accordance with the terms and conditions in place between Cardno and the Client for this project. Any third party agrees by accepting this report that any use or reliance on this report shall be limited by the exceptions and limitations in this report, and with the acknowledgment that actual site conditions may change with time, and that hidden conditions may exist at the property that were not discovered within the authorized scope of the assessment. Any use by or distribution of this report to third parties, without the express written consent of Cardno is at the sole risk and expense of such third party.

Cardno makes no other representation to any third party except that it has used the degree of care and skill ordinarily exercised by environmental consultants in the preparation of the report and in the assembling of data and information related thereto. No other warranties are made to any third party, either expressed or implied.

2 Sampling Activities

2.1 Asbestos Survey

A comprehensive asbestos survey was conducted on April 13, 2021 by Cardno's Mr. Ashton Smithwick, a licensed and accredited asbestos inspector, in accordance with the Asbestos Hazardous Emergency Response Act (AHERA) and Asbestos School Hazard Abatement Reauthorization Act (ASHARA). Mr. Smithwick was assisted by Cardno's Keith Ziobron, P.E. Mr. Smithwick's accreditation certificate is included as **Appendix C**.

In accordance with National Emission Standards for Hazardous Air Pollutants (NESHAP), 40 CFR 61-Subpart M, paragraph 145, all asbestos containing materials (ACMs) must be identified and removed prior to disturbance, either during a renovation or demolition. ACM is defined by OSHA as materials that contain greater than 1% asbestos fibers.

The ACM survey included a visual survey of all accessible interior/exterior areas of the on-site building. Destructive testing was performed to verify the existence and extent of ACM in all building materials. The roof and exterior were also included during this survey. This survey was performed in accordance with AHERA and NESHAP protocols.

All suspect materials, or homogeneous areas (HAs) were visually identified. Each HA was visually assess for condition, friability, and quantity. All identified ACMs were classified by their category as denoted by EPA NESHAP and OSHA. These categories include:

- Thermal System Insulation (TSI) – insulation typically over pipes, fittings, elbows, boilers, tanks, ducts, etc.
- Surfacing material – material that is sprayed, troweled-on, or otherwise applied to surfaces.
- Miscellaneous – All other ACMs
- Friable – ACM that can be crumbled pulverized or reduced to a powder by hand pressure when dry
- Category I Non-Friable – ACM consisting of packing material, gaskets, resilient floor covering, and asphalt roofing products
- Category II Non-Friable – All ACM that is not listed in Category I Non-Friable ACM
- Presumed Asbestos Containing Material (PACM) – all potential ACM not analytically analyzed

Each HA was visually assessed for condition, friability, and quantity. A summary of the bulk samples collected is included as **Table 1** and sample locations are depicted on **Figure 3**.

During the survey, Cardno collected 23 samples from the former Markwardt Brothers Garage building. All bulk samples were collected and stored in appropriate sample containers, labeled, and delivered to Eurofins EMLab P&K (EMLab) in Norcross, Georgia. EMLab analyzed all samples using Polarized Light Microscopy (PLM) via EPA Method 600/R-93/116. This laboratory is accredited by the National Institute of Standards of Technology (NIST), and is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP). A copy of the analytical results including the laboratory certification is included in **Attachment B**.

2.2 Limited Lead-Based Paint Survey

A limited LBP survey was conducted on April 13, 2020 by Cardno's Mr. Ashton Smithwick, an EPA-accredited LBP inspector. Mr. Smithwick was assisted by Cardno's Keith Ziobron, P.E. All testing was completed in accordance with applicable HUD, state, and federal regulations regarding LBP surveys. No previous LBP sampling information was provided by the client or the property owner.

The LBP testing was performed in accordance with the survey protocol in Chapter 7 of the HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing. Painted surfaces were tested by collected paint chips of various painted surfaces throughout the interior and exterior of the building. The roof and exterior were not included during this survey. LBP is defined by EPA as containing greater than 0.5% lead in painted materials.

During the survey, Cardno collected 12 paint chips samples from unique locations throughout the interior and exterior of the on-site building. A summary of all paint chip samples collected is included as **Table 2** and sample locations are depicted on **Figure 3**.

The paint chip samples were transferred into appropriate containers, labeled, and shipped to EMLab in Norcross, Georgia. The laboratory analyzed the samples using flame atomic absorption spectrometry (FAAS) via National Institute for Occupational Safety and Health (NIOSH) Method 7082. This laboratory is accredited by the NIST program, and is recognized under the NVLAP. A copy of the analytical results included the laboratory certification is included in **Appendix B**.

3 Analytical Results

3.1 Asbestos-Containing Materials

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-site building.
- Interior white texture and joint compound on drywall, totaling approximately 800 SF, located within the western most portions of the on-site building.
- Interior white caulk, totaling approximately 30 linear feet (LF), located on interior west wall windows.

The interior skim coat identified totaled approximately 3,600 SF and was located within the western most portions of the on-site building. This material was in fair condition and considered a friable surfacing material.

The texture and joint compound on drywall totaled approximately 800 SF and was located in Rooms 2 and 3. This material was in fair condition and considered a miscellaneous Category I non-friable material.

The interior white caulk totaled approximately 30 LF and was located in Room 3. This material was in good condition and considered a miscellaneous Category II non-friable material.

The following materials were not sampled and should be considered PACM:

- Exterior building debris from former attached north addition, totaling approximately 650 CY.

The north building addition was constructed around the same time as the main building, and the building debris appeared to have suspect materials. Therefore, the building debris should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

Photos of some of the identified ACMs are included as **Attachment A**.

The laboratory report is included as **Attachment B** with results summarized in **Table 1**.

3.2 Lead-Based Paint

In accordance with EPA, any paint containing 0.5% by weight of lead is categorized as containing lead. Based on the paint chip sampling results, the following painted surface tested positive for lead-based paint:

- Red paint on CMU on the south exterior wall, totaling approximately 3,600 SF.
- Tan/gray paint on wood on the Room 3 ceiling, totaling approximately 1,200 SF.

Photos of some of the identified LBPs are included as **Attachment A**. The laboratory report is included as **Appendix B** with results summarized in **Table 2**.

4 Conclusions/Recommendations

Based on the results of this Phase II ESA:

- The identified ACMs appears to be in good to fair condition. Prior to any renovation or demolition that may cause the ACM to become friable, these materials should be removed or abated by a qualified asbestos abatement contractor in compliance with federal, state, and local regulations. If the ACM is to be left in place, an O&M plan should be implemented regarding the handling of the identified ACM.
- The exterior building debris should be considered PACM and treated as ACM until further sampling by a licensed asbestos inspector indicates otherwise.
- The identified lead-based paint appeared to be overall in good to fair condition. The building is not considered a child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition.
- For the purposes of demolition or renovation, if the paint is well adhered to the substrate and will not be cut, sanded, or abraded by mechanical means for sizing than it can be disposed of along with the construction and demolition debris. Loose and flaking lead-containing paint should be removed and containerized as a waste stream for disposal purposes. Once all of the paint materials are collected for disposal, a waste profile sample should be collected to determine if the waste is hazardous. Hazardous materials must be properly containerized, transported, and disposed of in accordance with RCRA standards and regulations.

Figures

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LEGEND

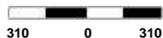
 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: USGS Topographic Map (2014)



"This is not a map of survey."



Phase I ESA
Former Markwardt Brothers
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 1
USGS/Site Vicinity
Map

LEGEND

 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth

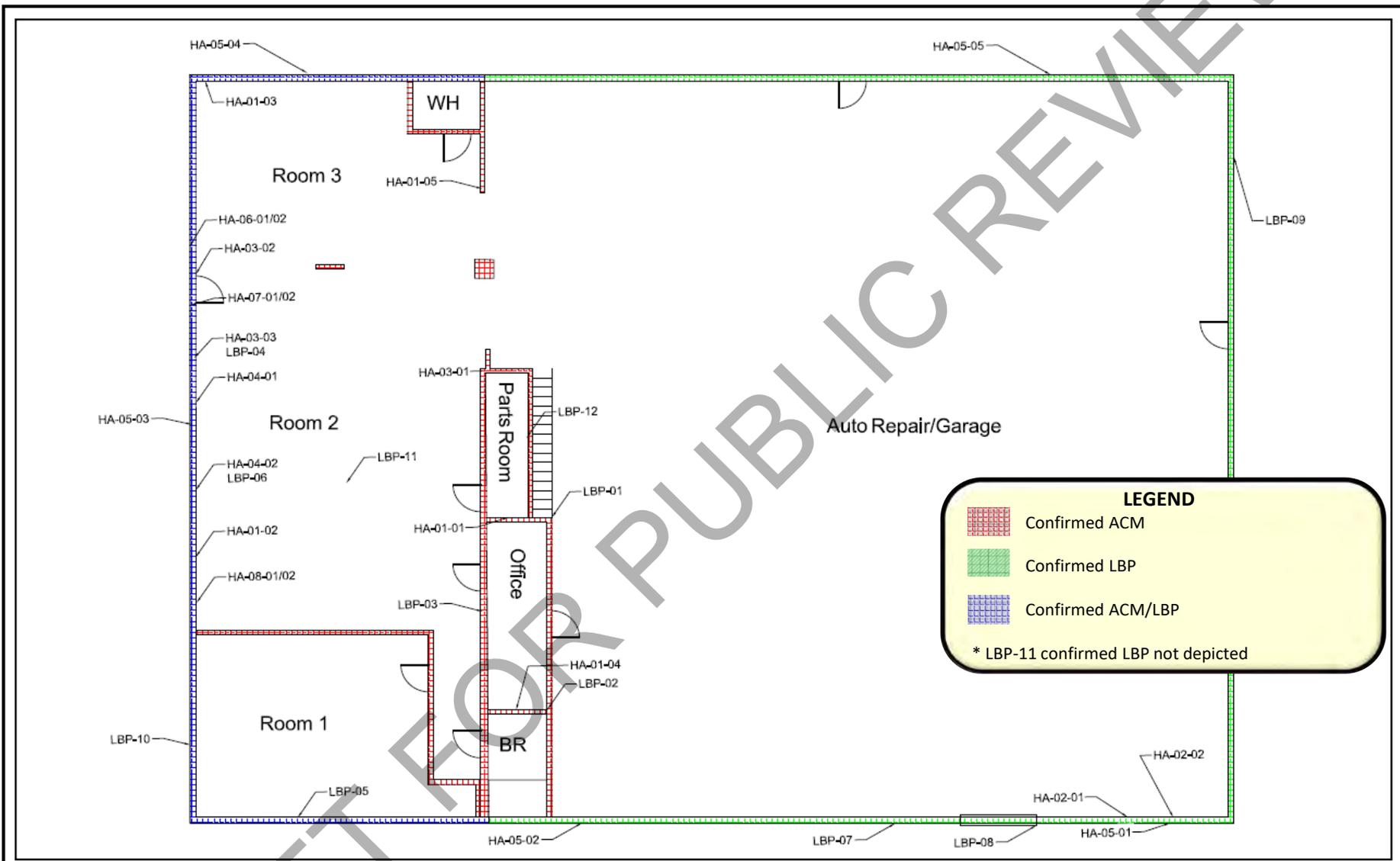


"This is not a map of survey."



Phase I ESA
Former Markwardt Brothers
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 2
Site Boundary Map



Tables

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TABLE 1: SUMMARY OF BULK SAMPLE ANALYSIS AND ASSESSMENT
 FACILITY NAME: FORMER MARKWARDT BROTHERS GARAGE
 CHILOQUIN, OREGON

HA ID	Date	HA Description	Material Location	Percent and Type of Asbestos Detected ¹	Estimated Quantity	Type of ACM ²	Friability ³	Physical Condition
HA-01-01	4/13/21	Interior plaster surfacing (Off-white plaster)	Parts room	NAD	N/A	N/A	NF	Good
HA-01-02	4/13/21	Interior plaster surfacing (white skim coat)	Room 2	2% CH	3,600 SF*	SM	F	Good
HA-01-03	4/13/21	Interior plaster surfacing (Off-white plaster)	Room 3	NAD	N/A	N/A	NF	Good
HA-01-04A	4/13/21	Interior plaster surfacing (white skim coat)	Office	2% CH	3,600 SF*	SM	F	Good
HA-01-04B	4/13/21	Interior plaster surfacing (Off-white plaster)	Office	NAD	N/A	N/A	NF	Good
HA-01-05	4/13/21	Interior plaster surfacing (Off-white plaster/gray debris)	Room 3	NAD	N/A	N/A	NF	Good
HA-02-01	4/13/21	Window glazing, gray	Auto repair/Garage	NAD	N/A	N/A	NF	Good
HA-02-02	4/13/21	Window glazing, gray	Auto repair/Garage	NAD	N/A	N/A	NF	Good
HA-03-01A	4/13/21	Drywall (Texture)	Room 3	2% CH	800 SF**	Misc. Cat 1	NF	Fair
HA-03-01B	4/13/21	Drywall (Cream tape)	Room 3	NAD	N/A	N/A	NF	Fair
HA-03-01C	4/13/21	Drywall (Joint Compound)	Room 3	2% CH	800 SF**	Misc. Cat 1	NF	Fair
HA-03-01D	4/13/21	Drywall (with brown paper)	Room 3	NAD	N/A	N/A	NF	Fair
HA-03-02A	4/13/21	Drywall (Texture)	Room 2	2% CH	800 SF**	Misc. Cat 1	NF	Fair
HA-03-02B	4/13/21	Drywall (Cream tape)	Room 2	NAD	N/A	N/A	NF	Fair
HA-03-02C	4/13/21	Drywall (Joint Compound)	Room 2	2% CH	800 SF**	Misc. Cat 1	NF	Fair
HA-03-02D	4/13/21	Drywall (with brown paper)	Room 2	NAD	N/A	N/A	NF	Good
HA-03-03A	4/13/21	Drywall (Texture)	Room 2	NAD	N/A	N/A	NF	Good
HA-03-03B	4/13/21	Drywall (Cream tape)	Room 2	NAD	N/A	N/A	NF	Good
HA-03-03C	4/13/21	Drywall (Joint Compound)	Room 2	NAD	N/A	N/A	NF	Good
HA-03-03D	4/13/21	Drywall (with brown paper)	Room 2	NAD	N/A	N/A	NF	Good
HA-04-01	4/13/21	Wall felt, black	Room 2	NAD	N/A	N/A	NF	Good
HA-04-02	4/13/22	Wall felt, black	Room 2	NAD	N/A	N/A	NF	Good
HA-05-01A	4/13/21	Exterior plaster surfacing (skim coat)	Southeast ext. wall	NAD	N/A	N/A	NF	Good
HA-05-01B	4/13/21	Exterior plaster surfacing (gray plaster)	South ext. wall	NAD	N/A	N/A	NF	Good
HA-05-02	4/13/21	Exterior plaster surfacing (gray plaster)	Southwest ext. wall	NAD	N/A	N/A	NF	Good
HA-05-03	4/13/21	Exterior plaster surfacing (gray plaster)	West ext. wall	NAD	N/A	N/A	NF	Good
HA-05-04	4/13/21	Exterior plaster surfacing (gray plaster)	Northwest ext. wall	NAD	N/A	N/A	NF	Good
HA-05-05	4/13/21	Exterior plaster surfacing (gray plaster)	Northeast ext. wall	NAD	N/A	N/A	NF	Good
HA-06-01	4/13/21	Exterior gray caulk	West ext. wall	NAD	N/A	N/A	NF	Good
HA-06-02	4/13/21	Exterior gray caulk	West ext. wall	NAD	N/A	N/A	NF	Good
HA-07-01	4/13/21	Exterior white caulk	West ext. wall	NAD	N/A	N/A	NF	Good
HA-07-02	4/13/21	Exterior white caulk	West ext. wall	NAD	N/A	N/A	NF	Good
HA-08-01	4/13/21	Interior white caulk	Room 2	2% CH	30 LF	Misc. Cat 2	NF	Good
HA-08-02	4/13/21	Interior white caulk	Room 2	2% CH	30 LF	Misc. Cat 2	NF	Good
N/A	4/13/21	Building debris	Exterior north addition	N/A	650 CY	PACM	F	Poor

*White skim coat on plaster quantity is obtained estimated total quantity of associated plaster

**Joint compound and texture quantity is obtained estimated total quantity of associated drywall

Notes:

(1) CH = Chrysotile; AM = Amosite; CR = Crocidolite; AN = Anthophyllite; AC = Actinolite; NAD = No Asbestos Detected

(2) Misc = Miscellaneous; TSI = Thermal System Insulation; SM= Surfacing Material

(3) F = Friable; NF = Non friable. For ACMs only; I = Non-Friable Category I; II = Non-Friable Category II

NM - not measured LF = linear feet PACM = Presumed Asbestos-Containing Materials

n/a - not applicable

SF = square feet CY = Cubic Yards

PS = Positive stop, sample not analyzed

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DRAFT VIEW

TABLE 2: SUMMARY OF PAINT CHIP ANALYSIS AND ASSESSMENT
FACILITY NAME: FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, OREGON

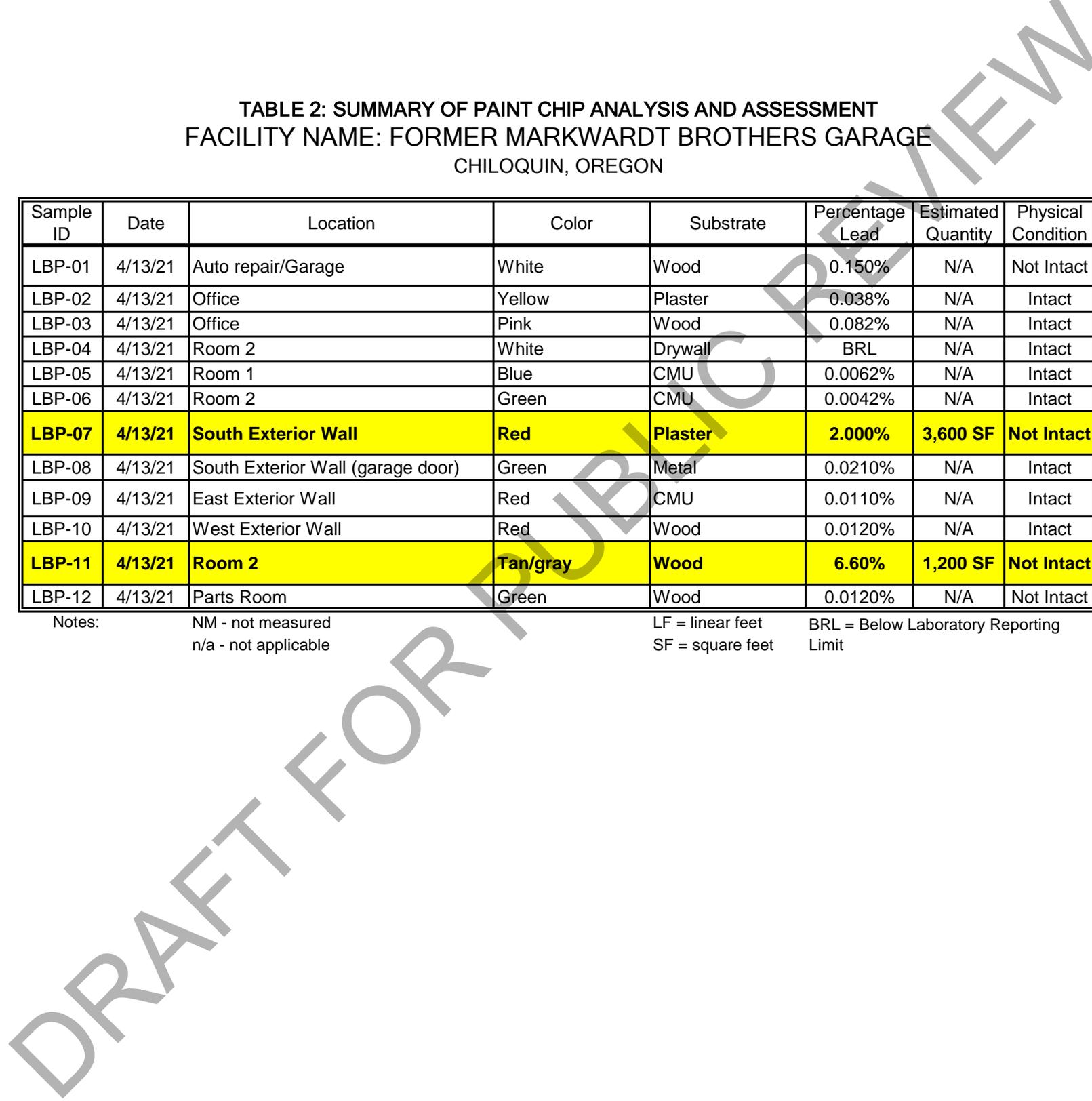
Sample ID	Date	Location	Color	Substrate	Percentage Lead	Estimated Quantity	Physical Condition
LBP-01	4/13/21	Auto repair/Garage	White	Wood	0.150%	N/A	Not Intact
LBP-02	4/13/21	Office	Yellow	Plaster	0.038%	N/A	Intact
LBP-03	4/13/21	Office	Pink	Wood	0.082%	N/A	Intact
LBP-04	4/13/21	Room 2	White	Drywall	BRL	N/A	Intact
LBP-05	4/13/21	Room 1	Blue	CMU	0.0062%	N/A	Intact
LBP-06	4/13/21	Room 2	Green	CMU	0.0042%	N/A	Intact
LBP-07	4/13/21	South Exterior Wall	Red	Plaster	2.000%	3,600 SF	Not Intact
LBP-08	4/13/21	South Exterior Wall (garage door)	Green	Metal	0.0210%	N/A	Intact
LBP-09	4/13/21	East Exterior Wall	Red	CMU	0.0110%	N/A	Intact
LBP-10	4/13/21	West Exterior Wall	Red	Wood	0.0120%	N/A	Intact
LBP-11	4/13/21	Room 2	Tan/gray	Wood	6.60%	1,200 SF	Not Intact
LBP-12	4/13/21	Parts Room	Green	Wood	0.0120%	N/A	Not Intact

Notes:

NM - not measured
n/a - not applicable

LF = linear feet
SF = square feet

BRL = Below Laboratory Reporting
Limit



Appendix A
Photographic Log

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Site Location:
Former Markwardt Brothers, Chiloquin, Oregon 97624

Project
CHILOQ100

Photo No.
1

Date:
4/13/2021

Direction Photo Taken:

Southwest

Description:

Confirmed ACM: White skim coat on plaster surfacing located in Room 2.



Photo No.
2

Date:
4/13/2021

Direction Photo Taken:

Southeast

Description:

Confirmed ACM: White texture and joint compound on drywall located in Room 2.



Site Location:
Former Markwardt Brothers, Chiloquin, Oregon 97624

Project
CHILOQ100

Photo No.
3

Date:
4/13/2021

Direction Photo Taken:
Southwest

Description:
Confirmed ACM: Interior white caulk located in Room 2.



Photo No.
4

Date:
4/13/2021

Direction Photo Taken:
Southeast

Description:
Confirmed ACM: Exterior red paint on plaster surfacing.



Site Location:
Former Markwardt Brothers, Chiloquin, Oregon 97624

Project
CHILOQ100

Photo No.
5

Date:
4/13/2021

Direction Photo Taken:
N/A

Description:
Confirmed LBP: Interior tan/gray paint on wood ceiling located in Room 2.



Photo No.
6

Date:
4/13/2021

Direction Photo Taken:
Southeast

Description:
Pile of building debris is PACM.



Phase II Environmental Site Assessment Report

Former Markwardt Brothers Garage
North 1st Avenue and West Chocktoot Street
Chiloquin, Klamath County, Oregon 97624

Prepared for: City of Chiloquin, Oregon
Oregon DEQ ECSI No. 6462

November 2, 2021



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Branch Manager

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City of
Chiloquin
1988

Prepared for City of Chiloquin
127 North 1st Avenue
Chiloquin, Oregon 97624,
USA

Project Name Phase II Environmental Site
Assessment Report
Former Markwardt Brothers
Garage

Cardo Project# CHILOQ100

Date November 2021

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1 Introduction

1.1 Purpose

Cardno was retained by the City of Chiloquin (Client) to conduct this Phase II Environmental Site Assessment (ESA) of the Former Markwardt Brothers Garage property, located northeast of the North 1st Avenue and West Chocktoot Street intersection in Chiloquin, Klamath County, Oregon (**Figure 1**), herein referred to as the “Subject Property” or “Site.” In addition, the Subject Property was entered into the Voluntary Letter Agreement (ECSI No. 6462) with the Oregon Department of Environmental Quality on June 4, 2021. This investigation was conducted in general conformance with the scope and limitations outlined by *ASTM Standard E1903-19*; however, the specific scope of work was negotiated between the Client and Cardno to meet the objectives of the Client.

The primary objective of the Phase II ESA was to further evaluate the identified recognized environmental conditions (RECs) (as defined in *ASTM Standard E1527-13*) and to provide sufficient information regarding the nature and extent of contamination to assist in making informed business decisions about the property; and, where applicable, providing the level of knowledge necessary to satisfy the Landowner Liability Protection provisions under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). RECs are defined by *ASTM Standard E1527-13* as: “the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substance or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.”

Oregon Department of Environmental Quality (ODEQ) issued a Voluntary Letter Agreement letter on June 3, 2021, accepting the Site into the ODEQ Voluntary Cleanup Plan (ECSI No. 6462). This assessment was completed in accordance with the Phase II Environmental Site Assessment Work Plan (Cardno, 2021c).

1.2 Site Location / Description

The Subject Property is comprised of two tax parcels (Parcel ID 3407-034DC-00400 & Parcel ID 3407-034DC-00500), currently owned by Klamath County, located at the center of downtown Chiloquin, Oregon, as shown on **Figure 2**. The Subject Property is bound by a commercial facility to the north, undeveloped/vacant land to the northeast, multi-commercial facility to the east, Sky Lakes Wilderness Adventures and Klamath Tribal Courts & Child Support Enforcement Office to the southeast, the Hirvi building to the south, a former gas station to the west, and the former Union Oil Bulk Plant property to the southwest. According to the Klamath County Tax Assessor’s website, the Site encompasses two parcels totaling approximately 0.55-acre. The Subject Property is developed with a single-story commercial building of concrete block and brick facade construction. A second building, historically occupied by the Chiloquin Mercantile, partially collapsed and was demolished with the exception of a vault. The associated rubble remains on-Site. The building is currently vacant and in the care of Klamath County.

1.3 Site History

According to the current property owner, the on-Site commercial structure was constructed in the late 1920s or early 1930s. The building previously supported a car dealership, grocery, bicycle repair shop, music school, and auto-body shop. The building formerly located on the north parcel was constructed during the same time-period and operated as the Chiloquin Mercantile. It was vacated at an unknown date, and collapsed in 2019. The collapsed building remains on-Site, described throughout this report as the debris pile.

1.4 Current Adjacent Land Uses

The Site is located in a commercial area of Chiloquin. Specific adjoining property uses are detailed in the following table:

Direction from Property	Occupant(s) Name	Current Use	Environmental Concerns
South	Hirvi Building	Commercial	None
West	Former Texaco Gas Station	Commercial	Historical REC #1
Northwest	Vacant	Undeveloped/Vacant	None
North	Vacant	Commercial	None
Northeast	Undeveloped/Vacant	Undeveloped/Vacant	None
East	Vacant/Multi-Commercial facility	Vacant Commercial	None
Southeast	Sky Lakes Wilderness Adventures	Commercial	None
Southeast	Klamath Tribal Courts & Child Support Enforcement Office	Municipal	None

1.5 Previous Environmental Assessments

Cardno completed a Phase I ESA and Asbestos and Lead-Based Paint Assessment on the Subject Property dated May 17, 2021 (Cardno, 2021a, 2021b). Through the review of historical records, interviews, and site reconnaissance, this assessment identified several RECs in connection with the Subject Property, including the following:

On-Site REC

1. According to the 1931 Sanborn Fire Insurance Map (FIM), the building was used as an auto repair garage (east portion), and "Gas & Oil" facility (southwest area). During site reconnaissance, Cardno personnel identified a potential underground storage tank (UST) vent pipe attached to the west interior wall of the on-Site building in an area consistent with the FIM gasoline station location. Therefore, there is potential for historical bulk storage and dispensing of petroleum products on the Subject Property, which may have impacted the soil, groundwater, and/or vapor at the Subject Property.
2. The remains of three in-ground hydraulic lifts and one oil-changing pit were observed in the building. According to the 1931 Sanborn FIM, the on-Site building is labeled as being an auto repair/garage facility. Additionally, based on the age of the building, this time-frame predates the regulation of the storage/disposal of hazardous substances such as used oil and other non-regulated automobile chemicals. Based on the age and duration of use, the in-ground lifts and unknown chemical management and disposal practices associated with historic operations, soil, groundwater, and/or vapor may have been impacted by historic Site operations.
3. During site reconnaissance, Cardno identified a second potential vent pipe in the interior of the building along the eastern wall. This feature is an indication of a second petroleum product UST and/or heating oil tank to exist on the Subject Property. Based on the age and duration of the former use of the building, there is potential for a UST/heating oil tank on the property that may have impacted the soil, groundwater, and/or vapor at the Subject Property.

Off-Site RECs

4. According to the 1931 Sanborn FIM, a Printing facility was located approximately 80 feet to the east. The length of operation for this facility is unknown. There is potential for a release from this facility.

According to the 1931 Sanborn FIM, a Cleaning facility was located approximately 120 feet to the southeast. The length of operation for this facility is unknown. There is a potential for a historic release from this facility.

Off-Site Historical RECs (HREC)

1. According to ODEQ records, the former Chiloquin Texaco, located west and approximately 45 feet away, indicate that four USTs were installed pre-1989 which predates UST registration. These tanks were removed from the property in July 1994, and three new registered gasoline USTs were installed in the UST tank excavation in August 1994. The new tanks were subsequently removed in 2017. With the exception of benzene and ethylbenzene in two soil samples in the 2017 UST excavation, petroleum hydrocarbon concentrations in soil and groundwater did not exceed applicable ODEQ Risk Based Concentrations (RBCs). On July 22, 2019, ODEQ granted a No Further Action (NFA) determination letter for the Chiloquin Texaco site. Based on the issuance of an NFA, and given the assumed ground water flow direction away from the subject Site, this facility is considered a historical REC. See Section 5.1 for further details.

Based upon the RECs identified above, Cardno recommended soil and groundwater analysis be conducted throughout the Subject Property to determine the presence and/or extent of contamination. An excerpt of the Phase I ESA is included in **Appendix A**.

Asbestos-Containing Materials

Asbestos containing materials (ACMs) were identified throughout the interior of the building including:

- Interior white skim coat on plaster surfacing, totaling approximately 3,600 square feet (SF), located within the western most portions of the on-Site building.
- Interior white texture and joint compound on drywall, totaling approximately 1,000 SF, located within the western most portions of the on-Site building.
- Interior white caulk, totaling approximately 50 linear feet (LF), located on interior west wall windows.

Overall, given the state of the buildings, most of these materials were in good to fair condition. Therefore, the identified ACM has a low probability of disturbance during ordinary use. Prior to any renovation or demolition that may cause the ACM to become friable, the material should be removed or abated by a qualified asbestos abatement contractor.

The following suspect building materials were not sampled and should be considered presumed asbestos containing materials (PACM):

- Exterior building debris from former attached north addition, totaling approximately 650 cubic yards (CY).

The building to the north was constructed around the same time as the remaining building, and the building debris appeared to have suspect materials. Therefore, the building debris/rubble should be considered asbestos containing until sampling by a licensed asbestos inspector indicates otherwise.

Lead-Based Paint

Lead-based paint (LBP) was identified on various painted surfaces throughout the interior and exterior of the building in various tenant spaces including:

- Red paint on exterior concrete masonry unit (CMU), totaling approximately 3,600 SF, located on the exterior east, south, and west walls.
- Tan/gray paint on interior ceiling, totaling approximately 1,200 SF, located on wood board ceiling on the southwest corner of the building.

Most of the identified painted surfaces were in poor condition, with peeling and deterioration noted. As the building is not considered to be a child-occupied facility, the identified LBP can be left intact unless disturbed during renovation or demolition.

The Asbestos and Lead-based Paint Survey report detailing the inspection and sampling results was issued on May 17, 2021, and provided as an attachment in **Appendix A**.

1.6 Limitations / Exceptions of Assessment

The conclusions and recommendations contained within this report are based on the data developed during this Phase II ESA investigation. This report was prepared for the Client and their assignee(s), and is intended solely for their use. This report is not intended for third-party use without the expressed written consent of the Client and Cardno. This assessment has been prepared in general accordance with accepted environmental methodologies referred to in *ASTM Standard 1903-19*, including limitations inherent in these methodologies.

No other warranty is expressed or implied.

1.7 Special Terms and Conditions (User Reliance)

No ESA can eliminate all uncertainty. Furthermore, any sample, either surface or subsurface, taken for chemical analysis may or may not be representative of a larger population. Professional judgment and interpretation are inherent in the process and uncertainty is inevitable. Additional assessment may be able to reduce the uncertainty. Even when Phase II ESA work is executed with an appropriate site-specific standard of care, certain conditions present especially difficult detection problems. Such conditions may include, but are not limited to, complex geological settings, the fate and transport characteristics of certain hazardous substances and petroleum products, the distribution of existing contamination, physical limitations imposed by the location of utilities and other man-made objects, and the limitations of assessment technologies.

Phase II ESAs do not generally require an exhaustive assessment of environmental conditions on a property. There is a point at which the cost of information obtained and the time required to obtain it outweigh the usefulness of the information and, in fact, may be a material detriment to the orderly completion of transactions. If hazardous substance or petroleum releases are confirmed on a parcel of property, the extent of further assessment is related to the degree of uncertainty that is acceptable to the user with respect to the real estate transaction. Measurements and sampling data only represent the site conditions at the time of data collection. Therefore, the usability of data collected as part of this Phase II ESA may have a finite lifetime depending on the application and use being made of the data. An environmental professional should evaluate whether the generated data are appropriate for any subsequent use beyond the original purpose for which it was collected.

This report is for the use and benefit of, and may be relied upon by the entity(s) identified in Section 1.1 of this report as the Client, as well as any of its affiliates and their respective successors and assigns, in connection with a commercial real estate transaction involving the property, and in accordance with the terms and conditions in place between Cardno and the Client for this project. Any third party agrees by accepting this report that any use or reliance on this report shall be limited by the exceptions and limitations in this report, and with the acknowledgment that actual site conditions may change with time, and that hidden conditions may exist at the property that were not discovered within the authorized scope of the assessment. Any use by or distribution of this report to third parties, without the express written consent of Cardno is at the sole risk and expense of such third party.

Cardno makes no other representation to any third party except that it has used the degree of care and skill ordinarily exercised by environmental consultants in the preparation of the report and in the

assembling of data and information related thereto. No other warranties are made to any third party, either expressed or implied.

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2 Beneficial Land and Water Use

2.1 Locality of the Facility

As defined by ODEQ, the Locality of the Facility is “any point where a human or an ecological receptor contacts or is reasonably likely to come into contact with facility related hazardous substances.” (ODEQ, 1998a) This definition takes into account the likelihood of contamination migrating over time onto adjacent or nearby properties.

The chemical data obtained from soil and groundwater samples collected from the Site are used to approximate the Locality of the Facility, which is estimated to include the subsurface soil, groundwater, and soil vapor at the Site as well as the groundwater on adjoining properties directly downgradient of the Site.

2.2 Land Use Determination

The land use determination was performed in accordance with the ODEQ Guidance for the Consideration of Land Use in Environmental Remedial Actions (ODEQ, 1998a). The current and possible future land uses and water uses at the Site determine the types of receptors (human and ecological) that could potentially come into contact with elevated concentrations of impacted environmental media (soil, groundwater, soil vapor).

The Site is zoned for commercial use (C) by Klamath County. All adjoining properties are similarly zoned as commercial by Klamath County.

Potential future occupants of the Site and Locality of the Facility may be commercial or residential depending on developer preference and appropriate land use categories. Potential current and future receptors in the Locality of the Facility include occupational and residential, as well as excavation and construction workers during potential remedial actions followed by land development and infrastructure construction. However, a residential occupancy of the Site is unlikely as the commercial zoning does not allow for residential occupancy under current zoning ordinances.

2.3 Groundwater Use

The beneficial water use determination was performed in accordance with ODEQ Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites (ODEQ, 1998b). A search of the Oregon Water Resources Department (OWRD) database and a driving reconnaissance of the area surrounding the Site did not identify any active drinking water supply wells on the Site or in the vicinity of the Site.

2.4 Surface Water

The nearest surface water body in proximity to the Site is the Williamson River, located approximately 0.15-mile to the west. A review of the US Fish and Wildlife Service’s National Wetland Inventory and Site reconnaissance did not discover the presence of on-Site surface waters or wetlands.

2.5 Beneficial Water Use Determination

The municipal water system supplies the Site and surrounding area with drinking water; further, there are no wetlands or surface water bodies in the Locality of the Facility. Based on these findings, beneficial uses of groundwater within the presumed Locality of the Facility and unconfined aquifer are unlikely.

3 Phase II ESA Activities

3.1 Sampling Objectives

3.1.1 Conceptual Site Model and Sampling Plan

The conceptual site model (CSM) takes into consideration the potential distribution(s) of contaminants with respect to the property and anticipated fate and transport characteristics of contaminants in the setting being assessed. The sampling plan was designed to provide for the collection of environmental media samples at locations and depths where impacts are most likely to occur.

The sampling plan developed for this project was based upon information provided in Cardno's May 2021 Phase I ESA. Specifically, soil and groundwater borings were located to assess for potential adverse impacts to the Site from the former underground bulk storage and dispensing of petroleum products and hazardous substance impacts from former on-Site automotive repair and in-ground hydraulic lifts, as well as impacts from off-Site dry-cleaning and printing facilities. Sample analysis performed under the CSM included: Volatile Organic Compounds (VOCs) by EPA Method 8260D, Semi-Volatile Organic Compounds (SVOCs) by EPA Method 8270E, Resource Conservation Recovery Act (RCRA) 8 metals by EPA Methods 6010D and 7470A/7471B, Polychlorinated Biphenyls (PCBs) by EPA Method 8082A, Total Petroleum Hydrocarbons (TPH) as Gasoline Range Organics (GRO) by Method NWTPH-Gx, and Diesel Range Organics (DRO) and Residual Range Organics (RRO) by Method NWTPH-Dx. The locations of borings and temporary monitoring wells installed to address identified RECs are noted in **Figures 3 and 4**.

3.1.2 Chemical Testing Plan/QAQC

The chemical testing plan was designed to detect the contaminants suspected to be present in the samples collected. This testing plan included tests which provide quality assurance (QA) and techniques that provide quality control (QC) over the chemical analysis. A completed chain of custody record accompanied each sample shipment to the analytical laboratory. Chain of custody records provide written documentation regarding sample collection and handling, identify the persons involved in the chain of sample possession, and a written record of requested analytical parameters.

3.1.3 Deviations from Phase II ESA Work Plan

Unless otherwise stated in this section, the work was performed without deviation from the protocols and procedures outlined in the Phase II ESA Work Plan (Cardno, 2021c).

The following deviations were encountered during this work:

- Due to access limitations, proposed borings B-1, as listed in the Phase II ESA Work Plan, could not be advanced adjacent to potential on-Site underground storage tank (UST) due to ceiling clearance and was relocated to the exterior. Proposed borings B-2 and B-9 were relocated to the interior of the building in order to avoid subsurface utilities.
- GPR investigation of the second UST, potentially located along the east wall was not completed.
- Well locations and elevations were not surveyed as planned using a Global Positioning System device or conventional survey equipment; as such, a potentiometric surface map was not produced.
- Cardno collected two of the proposed four paint chip samples from the debris pile.

3.2 Field Investigation and Methods

3.2.1 Soil Boring Installations & Sampling Activities

Based on the results of the Phase I ESA, nine soil borings (B-1 through B-9) were installed using a track-mounted direct push technology (DPT) drill rig, as depicted on **Figure 3**. Per the Phase II ESA Work Plan and in accordance to Cardno's CSM, borings B-1 through B-5 were converted to temporary monitoring wells (TMW-1 through TMW-5). All boring and monitoring wells were advanced in strategic locations based on the RECs identified in connection with the Subject Property.

During advancement of the soil borings, DPT soil cores were logged for lithology and screened in-field with an Organic Vapor Analyzer (OVA) equipped with a Photoionization Detector (PID). On August 17, 2021, Cardno and a subcontracted drilling company, Steadfast Services Northwest, LLC (Steadfast), mobilized to the Subject Property to perform soil sampling and installation of temporary groundwater monitoring wells. These borings were advanced into groundwater using a track-mounted GeoProbe DPT drill rig. Soil boring logs are included in **Appendix B**.

A summary of each soil boring, including total depth, sampling depth, sample location and intended purpose is outlined below.

Boring B-1 was located along North 1st Avenue and west of the on-Site building. The purpose of the boring was to identify possible contaminant migration from the underground storage tank and automotive service operations on-Site. Boring B-1 was advanced on August 17, 2021, to a total depth of 15 feet below ground surface (bgs). No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from two to four feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Boring B-2 was located within the interior of the southeast corner of the on-Site building. The purpose of the boring was to identify possible contamination from the off-Site dry-cleaning and printing facilities. Boring B-2 was advanced on August 17, 2021, to a total depth of 10 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Boring B-3 was located north of the on-Site building and debris/rubble pile. The purpose of the boring was to identify possible contamination from off-Site dry-cleaning and printing facilities. Boring B-3 was advanced on August 17, 2021, to a total depth of 12 feet bgs. No odors or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Boring B-4 was located north of the on-Site building and west of the on-Site rubble pile. The purpose of the boring was to identify possible contaminant migration from the UST and automotive service operations from the former on-Site underground storage tank and automotive service operations. Boring B-4 was advanced on August 17, 2021, to a total depth of 15 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Boring B-5 was located in the center of the on-Site building adjacent to a hydraulic in-ground lift. The purpose of the boring was to identify possible contamination from former auto service operations and the hydraulic in-ground lift. Boring B-5 was advanced on August 17, 2021, to a total depth of 15 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, DRO, RRO, and GRO.

Boring B-6 was located within the interior of the on-Site building adjacent to a hydraulic in-ground lift. The purpose of the boring was to identify possible contamination from former auto service operations and the hydraulic in-ground lift. Boring B-6 was advanced on August 17, 2021, to a total depth of 10 feet bgs.

No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, DRO, RRO, and GRO. A duplicate soil sample was collected from zero to two feet bgs and analyzed for VOCs.

Boring B-7 was located within the interior of the on-Site building adjacent to a hydraulic in-ground lift. The purpose of the boring was to identify possible contamination from former auto service operations and the hydraulic in-ground lift. Boring B-7 was advanced on August 17, 2021, to a total depth of 10 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from zero to two feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, DRO, RRO, and GRO.

Boring B-8 was located within the interior of the on-Site building and north of the potential UST identified during the GPR survey. The purpose of the boring was to identify possible contaminant migration from the on-Site UST and automotive service operations. Boring B-8 was advanced on August 17, 2021, to a total depth of 6 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from two to four feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Boring B-9 was located within the interior of the on-Site building near the northern wall. The purpose of the boring was to identify possible contaminant migration from a potential on-Site UST. Boring B-9 was advanced on August 17, 2021, to a total depth of 10 feet bgs. No elevated OVA readings, odors, or visual indications of contamination were noted in the soil column. A soil sample was collected from two to four feet bgs and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

A total of 10 soil samples, including a field duplicate sample, were collected for laboratory analysis. These samples were submitted to Pace Analytical Service, Inc. (Pace), in Mount Juliet, Tennessee, under Chain-of-Custody protocol. A soil analytical summary (detections only) is provided in **Table 1**. Laboratory analytical reports are included in **Appendix D**.

3.2.2 Temporary Monitoring Well Installation & Groundwater Sampling Activities

Five of the soil borings were extended into the water table and converted into temporary groundwater monitoring wells (TMW-1, TMW-2, TMW-3, TMW-4, and TMW-5) on August 17, 2021. Locations of the temporary monitoring wells are depicted on **Figure 4**.

Temporary, one-inch diameter, polyvinyl chloride (PVC) monitoring wells were installed in 10-foot sections after the borings were advanced into the water table. The well screens were 0.010-inch PVC and screen lengths for each well were 10 feet. Silica sand packs were installed to surface.

After their installation, the temporary monitoring wells were developed until at least five well volumes were removed or until the well was fully evacuated of groundwater. Suspended fines and foreign materials from the initial soil borings were purged during development with the goal of encouraging formation groundwater to enter the well screen. Non-aqueous phase liquid (NAPL) or free product was not observed in the temporary monitoring wells during the course of this investigation.

Prior to sampling, the wells were purged with a peristaltic pump until either a minimum of three well volumes were purged or until groundwater quality parameters stabilized. Groundwater quality parameters measured include pH, temperature, conductivity, and dissolved oxygen. These parameters were measured using a YSI ProSeries Professional Plus. Turbidity was measured utilizing a Hach 2100Q turbidity meter to verify that groundwater turbidity was less than 10 Nephelometric Turbidity Units (NTU). Cardno was unable to obtain <10 NTUs in all monitoring wells (TMW-1 through TMW-5); turbidity ranged from 692.34 NTUs in TMW-2 to 33.96 NTUs in TMW-4.

A summary of each installed groundwater well is as follows:

Temporary Monitoring Well TMW-1 was installed at the location of B-1 and over three well volumes were purged. After groundwater parameters stabilized, a groundwater sample was collected on August 18, 2021, and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Temporary Monitoring Well TMW-2 was installed at the location of B-2 and over three well volumes were purged. After groundwater parameters stabilized, a groundwater sample was collected on August 18, 2021, and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Temporary Monitoring Well TMW-3 was installed at the location of B-3 and over three well volumes were purged. After groundwater parameters stabilized, a groundwater sample was collected on August 18, 2021, and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO. A duplicate groundwater sample was collected and analyzed for VOCs.

Temporary Monitoring Well TMW-4 was installed at the location of B-4 and over three well volumes were purged. After groundwater parameters stabilized, a groundwater sample was collected on August 18, 2021, and analyzed for VOCs, SVOCs, RCRA 8 metals, DRO, RRO, and GRO.

Temporary Monitoring Well TMW-5 was installed at the location of B-5 and over three well volumes were purged. After groundwater parameters stabilized, a groundwater sample was collected on August 18, 2021, and analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, DRO, RRO, and GRO.

A total of six groundwater samples, including a field duplicate sample, were collected and submitted to Pace in Mount Juliet, Tennessee, under chain-of-custody protocol. A groundwater analytical summary (detections only) is provided in **Table 2**. Groundwater sampling logs can be found in **Appendix C**. Laboratory analytical reports are included in **Appendix D**. Following groundwater sampling activities, each of the temporary monitoring wells were decommissioned by a licensed driller.

3.2.3 Investigation Derived Waste

Investigation derived waste (IDW) generated during this investigation included all materials recovered during boring and monitoring well installation and sampling activities. IDW were containerized in a 55-gallon drum which was staged on the Subject Property. A total of one 55-gallon drum was labeled as non-hazardous waste with waste generator information provided. The 55-gallon drum will be disposed at a Subtitle D landfill in accordance with all appropriate regulations.

3.2.4 Ground Penetrating Radar

Based on Cardno's findings from the May 2021 Phase I ESA, the former Markwardt Brothers Garage building was used as an auto repair garage and gasoline filling station. Further, Cardno personnel identified potential UST vent pipes attached to the west interior wall in the vicinity of the area historically used as a gasoline filling station as well as a second vent pipe in the eastern area of the building which potentially serviced a heating oil tank.

On August 17, 2021, Cardno subcontracted GPR Data Inc. (GPR Data) to conduct a ground penetrating radar (GPR) study in the area identified in the 1931 Sanborn FIM and subsurface utility clearing of all boring/well locations. GPR field investigation began with the utilization of a Geophysical Survey Systems Inc. (GSSI) Utility Scan LT GPR system, configured with a 400-Megahertz (MHz) GPR antenna connected to a SIR3000. Upon completion, GPR Data identified one anomaly, appearing to represent patterns, data, and information comparable to a UST in the interior of the building. No other anomalies or evidence of additional USTs were noted. The approximate location of the UST is depicted in **Figure 5** and the GPR report is included in **Appendix E**.

3.2.5 Debris Characterization Analysis

Per the Phase II ESA Work Plan dated June 23, 2021, Cardno proposed to collect up to 10 bulk samples from the debris/rubble pile for laboratory analysis by polarized light microscopy (PLM) to determine

asbestos fiber content. Further, Cardno proposed the collection of up to four (4) paint chip samples to be collected from the debris/rubble pile and analyzed for lead by Toxicity Characteristic Leaching Procedure (TCLP).

During Cardno's Phase II ESA activities, Cardno's Ashton Smithwick, a licensed and accredited asbestos inspector, collected six (6) bulk samples from the debris/rubble pile and submitted these samples to Eurofins EMLab P&K (EMLab) in Norcross Georgia. EMLab analyzed all samples using Polarized Light Microscopy (PLM) via EPA Method 600/R-93/116. This laboratory is accredited by the National Institute of Standards of Technology (NIST), and is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP). EMLab participates as a nationally recognized laboratory accreditation program for asbestos testing, as required by ODEQ regulation OAR 430-248-0270(3)(c). A bulk sample analysis summary is provided in **Table 3**. A copy of the analytical results including the laboratory certification is included in **Appendix D**.

Further, Mr. Smithwick, an EPA-trained lead-based paint (LBP) inspector, collected two samples from the debris/rubble pile to be analyzed for lead by Toxicity Characteristic Leaching Procedure (TCLP). These samples were submitted to Pace in Mount Juliet, Tennessee, under chain-of-custody protocol. A TCLP analysis summary is provided in **Table 4**. A copy of the analytical results including the laboratory certification is included in **Appendix D**.

4 Environmental Assessment Results

4.1 Site Geology

Based on the soil boring log data, soil underlying the Site predominantly consists of unconsolidated sand and silt deposits to the deepest terminal boring depth of 15 feet below ground surface (bgs). Generally, these deposits were represented by sandy silt, with less common observances of gravel and clay. Soil was consistently observed to be brown with the exception of the sand observed from 13.5-15 feet bgs in boring B-5 which was observed to be gray.

4.2 Site Groundwater

Groundwater was encountered in soil borings B-1 through B-5 between 5 and 8 feet bgs. Static groundwater on August 18, 2021, was observed between 9.59 and 10.62 feet below top of temporary well casings, which approximately corresponded to ground surface elevations. A summary of shallow water table data collected on August 18, 2021, is provided on **Table 5**.

4.3 Analytical Data Results

4.3.1 Soil

A comparison of the laboratory analytical results to the ODEQ RBCs (ODEQ, 2018) for sample results above laboratory reporting limits is presented in **Table 1**.

Select VOC (**1,2,4-trimethylbenzene** and **xylenes (total)**), RCRA 8 metal (**barium, chromium, lead, and mercury**), DRO, and RRO concentrations were present above laboratory reporting limits. A discussion of soil analytical results and exceedances of applicable RBCs is included in Section 5.

SVOCs, PCBs, and GRO concentrations were not present above laboratory reporting limits in soil samples analyzed from the Site.

4.3.2 Groundwater

A comparison of the laboratory analytical results to the RBCs for sample results above laboratory reporting limits is presented in **Table 2**.

With the exception of **GRO, barium, chromium, and lead**, analyzed constituents were not present in groundwater above laboratory reporting limits. A discussion of groundwater analytical results and exceedances of applicable RBCs is included in Section 5.

VOCs, SVOCs, DRO, and RRO concentrations were not reported above laboratory reporting limits in groundwater samples analyzed from the Site.

4.3.3 Quality Assurance and Quality Control Methods

Samples were labeled with a distinct sample identification number, the sampler's initials, and the date of the collection. Each sample container was sealed, labeled, placed on ice in a cooler, and shipped to Pace within the sample hold times. A completed chain-of-custody form was initiated in the field and accompanied the samples when submitted to the laboratory for analyses.

Copies of the chain-of-custody forms are shown in the laboratory analytical reports included as **Appendix D**.

4.3.4 Debris Characterization Analysis

Based on the analytical results of suspect ACM samples collected from the debris pile for the purpose of debris characterization, the following materials were identified as asbestos-containing:

- White texture with paint on drywall
- White joint compound on drywall

The drywall identified throughout the debris/rubble pile appeared to be in poor condition and is considered a friable material. The laboratory report is included as **Appendix D** with results summarized in **Table 3**. Additionally, samples collected from the debris/rubble pile and analyzed for TCLP indicated lead was below laboratory method detection limits. The laboratory report is included as **Appendix D** with results summarized in **Table 4**.

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5 Conceptual Site Model

The conceptual site model (CSM) takes into consideration the potential distribution(s) of contaminants with respect to the property and anticipated fate and transport characteristics of contaminants in the setting being assessed. The CSM further summarizes the receptors (human and ecological) and potential exposure pathways to regulated contaminants discovered in the Site subsurface (soil, groundwater, and soil vapor). Human exposure to contaminants on the Subject Property is evaluated according to the type and extent of exposure expected based on the Site's current and reasonable future use. ODEQ publishes RBCs for commonly discovered contaminants (ODEQ, 2018). The RBCs are calculated for varying exposure pathways and scenarios, and are conservative estimates of protective levels of contaminant concentrations in soil, groundwater, and air.

5.1 Sources

The sources of contaminant concentrations on the Subject Property include the potential for a release of petroleum products to the soil and groundwater from historical on-site automotive repair and operation of an UST system used to dispense fuels.

5.2 Potential Exposure Pathways and Receptors

Current and likely future land uses according to zoning regulations or known redevelopment plans were used to develop a model describing potential exposure pathways on the Subject Property. The Subject Property is currently an unoccupied building originally constructed as an automotive repair and gasoline filling station facility, zoned for commercial use, located in an area with a mix of residential and occupational uses on adjoining and nearby properties. According to Klamath County zoning ordinance, the Site's commercial zoning class allows for the following uses:

- Retail trade establishments such as food stores, drug stores, hardware stores, furniture stores, appliance sales, equipment sales, automobile sales, or clothing sales;
- Business, governmental or professional office;
- Service commercial establishment such as motel, gasoline service station or restaurant;
- Financial institution;
- Personal and business service such as barber shop, tailoring shop, printing shop, laundry or dry cleaning establishment;
- Commercial amusement such as a bowling alley or theater;
- Similar uses as authorized by the city council;

Therefore, potential human receptors on the Site and on nearby/off-Site properties could include residential, occupational, construction workers, and excavation workers.

The exposure pathways for the Site and a determination if said pathways are considered complete are summarized in the following table:

Pathway	Potential Receptor	Complete Pathway?	Basis for selection/exclusion
SOIL			
Ingestion, dermal contact, and inhalation	Residential	No	There are no contaminant concentrations exceeding residential ingestion/dermal contact/inhalation RBCs.

Pathway	Potential Receptor	Complete Pathway?	Basis for selection/exclusion
	Occupational	No	There are no contaminant concentrations exceeding occupational ingestion/dermal contact/inhalation RBCs.
	Construction worker	No	There are no contaminant concentrations exceeding construction worker ingestion/dermal contact/inhalation RBCs.
	Excavation worker	No	There are no contaminant concentrations exceeding excavation worker ingestion/dermal contact/inhalation RBCs.
Vapor intrusion into buildings and outdoor air	Residential	No	There are no contaminant concentrations exceeding residential or occupational vapor intrusion RBCs.
	Occupational	No	
Leaching to groundwater	Residential	No	Lead was detected above the residential and occupational leaching to groundwater RBC. However, the leaching to groundwater pathway is incomplete on the Subject Property and Locality of the Facility based on empirical groundwater data collected from the Site, and the availability of municipal drinking water to the Site and surrounding area.
	Occupational	No	
GROUNDWATER			
Ingestion and inhalation from tap water	Residential	No	The groundwater pathway is incomplete at the Subject Property and in the Locality of the Facility due to the availability of municipal drinking water to the Site and surrounding area.
	Occupational	No	
Vapor intrusion into buildings and outdoor air	Residential	No	There are no contaminant concentrations exceeding residential or occupational vapor intrusion RBCs.
	Occupational	No	
Groundwater in excavation	Construction and excavation worker	No	There are no contaminant concentrations exceeding occupational groundwater in excavation RBCs.

Note: Yes = Pathway is complete; No = Pathway is incomplete; Potential = Pathway may be potentially complete in the future

5.3 Risk-Based Screening of Laboratory Analytical Data

In order to evaluate the risk posed to human health and the environment, the soil and groundwater analytical data collected during this assessment was compared to the generic RBCs developed by ODEQ.

5.3.1 Soil

5.3.1.1 *Direct Contact (Ingestion, Dermal Contact, and Inhalation)*

VOC, GRO, DRO, RRO, and RCRA 8 metal constituents with reported concentrations above laboratory method detection limits do not exceed direct contact RBCs in soil samples collected from the Site.

5.3.1.2 *Vapor Intrusion into Buildings and Volatilization into Outdoor Air*

Concentrations of **VOCs** in soil samples do not exceed vapor intrusion into buildings or volatilization into outdoor air RBCs.

5.3.1.3 *Leaching to Groundwater*

Lead concentrations in the soil samples collected from B-2, B-3, B-6, and B-7 exceed the leaching to groundwater RBC of 30 milligrams per kilogram; however, lead was not reported above laboratory reporting limits in groundwater samples collected from the Site, with the exception of TMW-3 where lead was reported at 26.7 µg/L. The leaching to groundwater pathway is incomplete on the Subject Property and Locality of the Facility based on the empirical groundwater data from the Site and the availability of municipal drinking water to the Subject Property and surrounding area.

5.3.2 Groundwater

5.3.2.1 *Direct Contact (Ingestion and Inhalation)*

Concentrations of analyzed constituents do not exceed direct contact RBCs.

5.3.2.2 *Vapor Intrusion into Buildings and Volatilization into Outdoor Air*

Concentrations of analyzed constituents do not exceed volatilization to outdoor air or vapor intrusion into buildings RBCs.

5.3.2.3 *Groundwater in Excavation*

Concentrations of analyzed constituents do not exceed groundwater in excavation RBCs.

6 Discussion of Findings

6.1 Recognized Environmental Conditions

Based on the results of this assessment, the recognized environmental conditions and non-scope considerations discussed in the previous Phase I ESA appear to have been evaluated. No additional RECs were encountered during this investigation.

6.2 Affected Media

6.2.1 Soil Impacts

Lead concentrations reported in soil samples B-2, B-3, B-6, and B-7 exceed the residential and occupational leaching to groundwater RBC; however, no lead concentrations were reported above laboratory reporting limits with the exception of TMW-3 at 26.7 µg/L. Therefore, the general absence of lead in groundwater samples collected from the Site and the availability of municipal drinking water to the surrounding area mitigates the risk of lead leaching to groundwater.

6.2.2 Groundwater Impacts and Shallow Depth to Groundwater

Groundwater samples did not contain concentrations of analyzed constituents exceeding applicable residential and occupational RBCs.

Groundwater was observed across the Site at approximately 10 feet bgs.

6.2.3 Debris Characterization

White texture with paint and white joint compound were identified as asbestos-containing and the drywall on which they were found is considered a friable material. Painted building materials from the debris pile were collected and analyzed for lead using the TCLP. TCLP results were below laboratory reporting limits. The debris/rubble pile equates to approximately 200 cubic yards, and should be disposed of as regulated asbestos waste in accordance with federal, state, and local guidelines.

6.3 Vapor Intrusion Screening

Based on groundwater analytical results, the potential for vapor intrusion and/or encroachment is not a concern for the Subject Property's current or future developed status.

7 Phase II ESA Conclusions & Recommendations

Cardno has completed a Phase II ESA for the former Markwardt Brothers Garage property, located northeast of the North 1st Avenue and West Chocktoot Street intersection, in Chiloquin, Oregon. The Phase II ESA was conducted to determine if the RECs identified by Cardno in the May 2021 Phase I ESA have impacted soil, groundwater, or vapor conditions at the Site. In order to address these RECs, a series of soil borings and temporary monitoring wells were installed in pre-determined locations. Soil and/or groundwater samples were submitted for laboratory analysis from each of the borings.

The soil and groundwater samples were selectively analyzed for VOCs, SVOCs, RCRA 8 metals, PCBs, GRO, DRO, and RRO. With the exception of lead in soil samples collected from borings B-2, B-3, B-6, and B-7, analyzed constituents were not present at concentrations exceeding their respective RBCs.

Based on the results of this Phase II ESA and the Beneficial Land and Water Use completed in association with the Phase II ESA, Cardno recommends the following action items:

- Based on the GPR report provided by GPR Data, the area of the potential UST anomaly should be further investigated. If a UST is discovered, said UST should be removed from the ground and reported in accordance with ODEQ guidelines;
- The potential for an additional heating oil UST in the Subject Property's east area (building interior east wall) should be further evaluated by installing a test pit/exploratory excavation, and if confirmed, the UST should be removed in accordance with ODEQ guidelines;
- The debris/rubble pile should be characterized as regulated asbestos waste, and should be removed from the Site by a qualified asbestos abatement contractor in compliance with federal, state, and local regulations.

8 Qualifications/Signatures of Environmental Professional(s)

Prepared by:

I declare that I meet the definition of Environmental Professional as defined in 40 CFR Part 312.10 and that I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. I further certify that in my professional judgment, this report meets the general requirements of *ASTM Method E1903-19, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

for Cardno



W. Ashton Smithwick
Geologist I

Date: November 2021

QA/QC by:

I declare that I meet the definition of Environmental Professional as defined in 40 CFR Part 312.10 and that I have the specific qualifications based on education, training, and experience to assess a property of the nature, history, and setting of the Subject Property. I further certify that in my professional judgment, this report meets the general requirements of *ASTM Method E1903-19, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

for Cardno

Keri L. Chappell, R.G.
Project Geologist

Date: November 2021

for Cardno



Keith Ziobron, PE
Senior Principal

Date: November 2021

9 References

ASTM International. 2013. *ASTM Standard E1527-13, Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*.

ASTM International. 2019. *ASTM Method E1903-19, Standard Practice for Environmental Site Assessments: Phase II Environmental Site Assessment Process*.

Cardno. May 17, 2021a. *Asbestos & Lead-Based Paint Survey, Former Markwardt Brothers Garage, North 1st Avenue and West Chocktoot Street, Chiloquin, Klamath County, Oregon*.

Cardno. May 17, 2021b. *Phase I Environmental Site Assessment, Former Markwardt Brothers Garage, Chiloquin, Klamath County, Oregon*.

Cardno. June 23, 2021c. *Phase II Environmental Site Assessment Work Plan, Former Markwardt Brothers Garage, North 1st Avenue and West Chocktoot Street, Chiloquin, Oregon*.

Oregon Department of Environmental Quality (ODEQ). July 1, 1998a. *Guidance for Consideration of Land Use in Environmental Remedial Actions*. (October 2017 update to contact information and website links).

Oregon Department of Environmental Quality (ODEQ). July 1, 1998b. *Guidance for Conducting Beneficial Water Use Determinations at Environmental Cleanup Sites*. (October 2017 update to contact information and website links).

Oregon Department of Environmental Quality, Environmental Cleanup Program (ODEQ). May 2018. *Risk-Based Concentrations for Individual Chemicals*

FORMER MARKWARDT
BROTHERS GARAGE

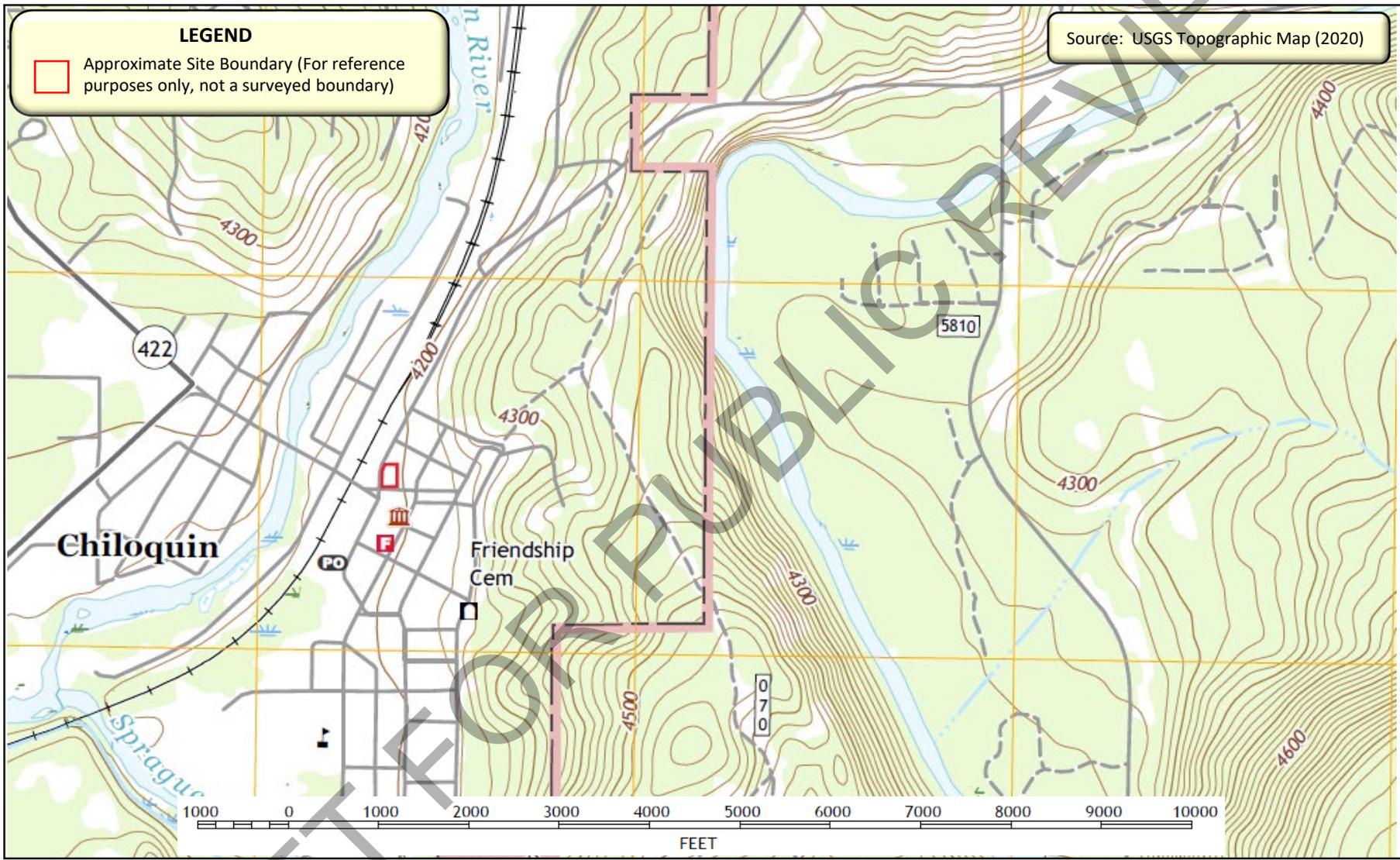
FIGURES



Source: USGS Topographic Map (2020)

LEGEND

 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



"This is not a map of survey."



Phase II ESA
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 1
Site Vicinity Map

LEGEND

 Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



Map not scaled

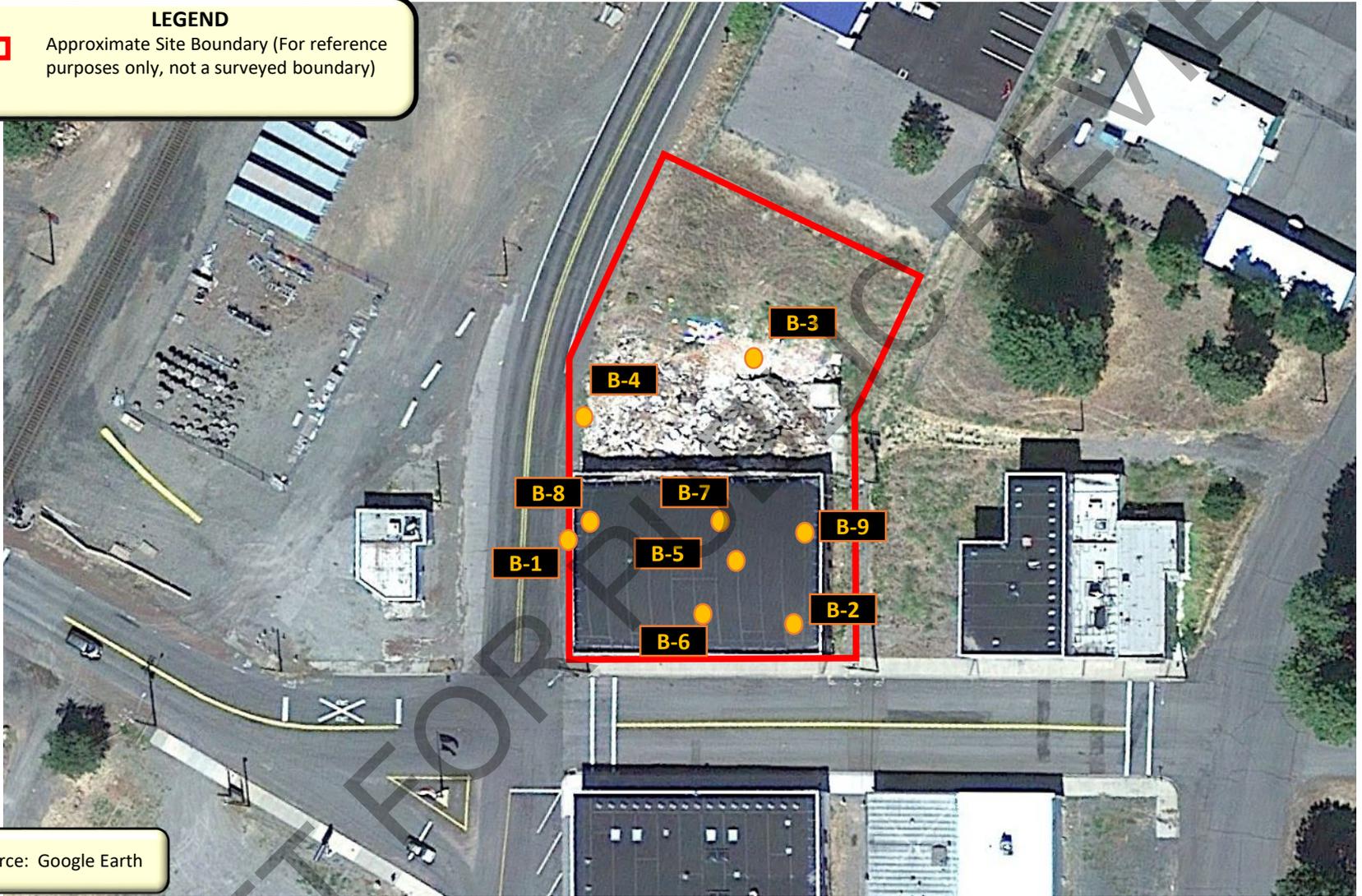
Phase II ESA
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 2
Site Boundary Map

LEGEND



Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



Map not scaled

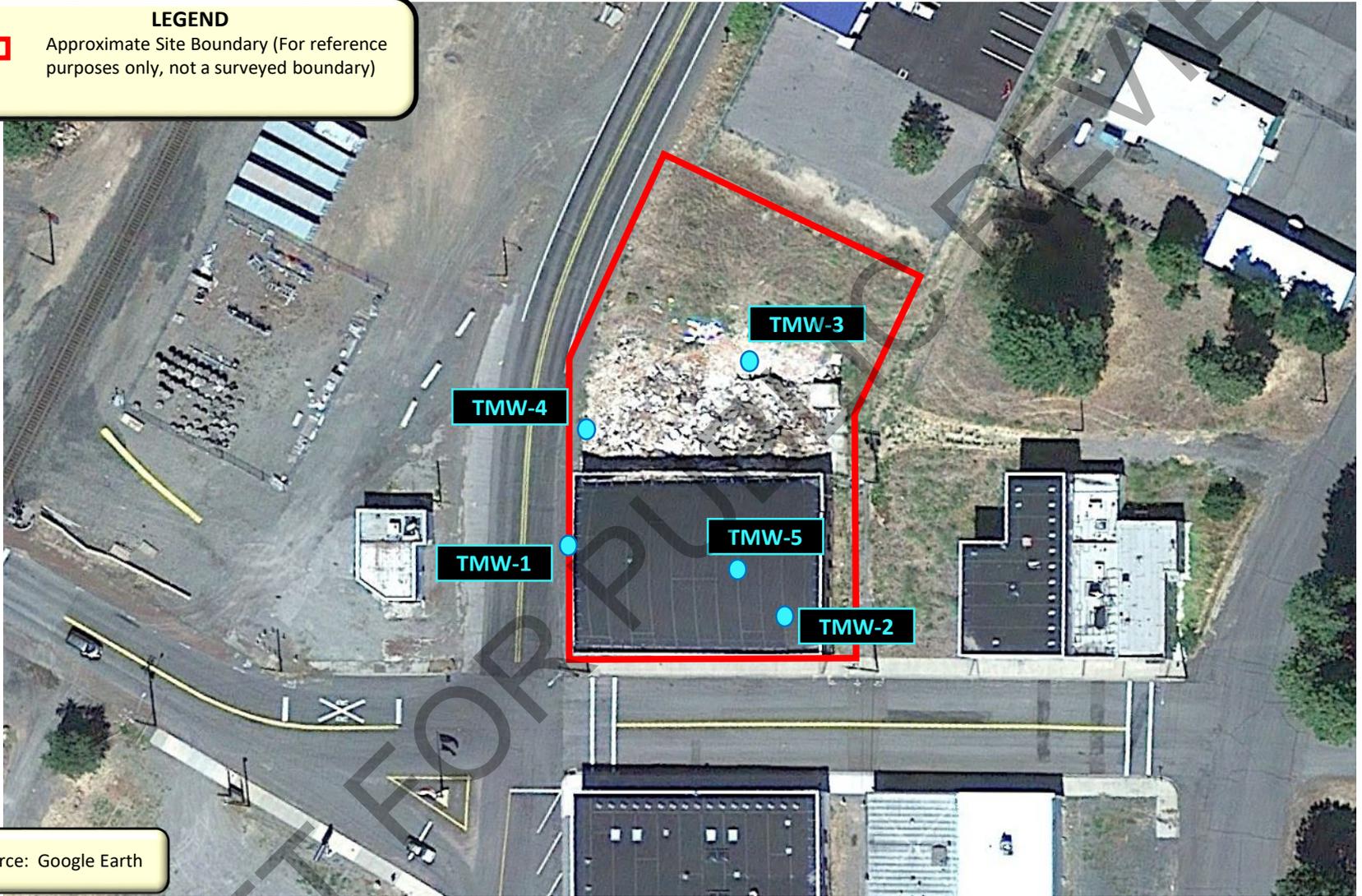
Phase II ESA
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 3
Soil Boring Location Map

LEGEND



Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Source: Google Earth



This is not a map of survey.



Map not scaled

Phase II ESA
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 4
Temporary Monitoring Well
Location Map

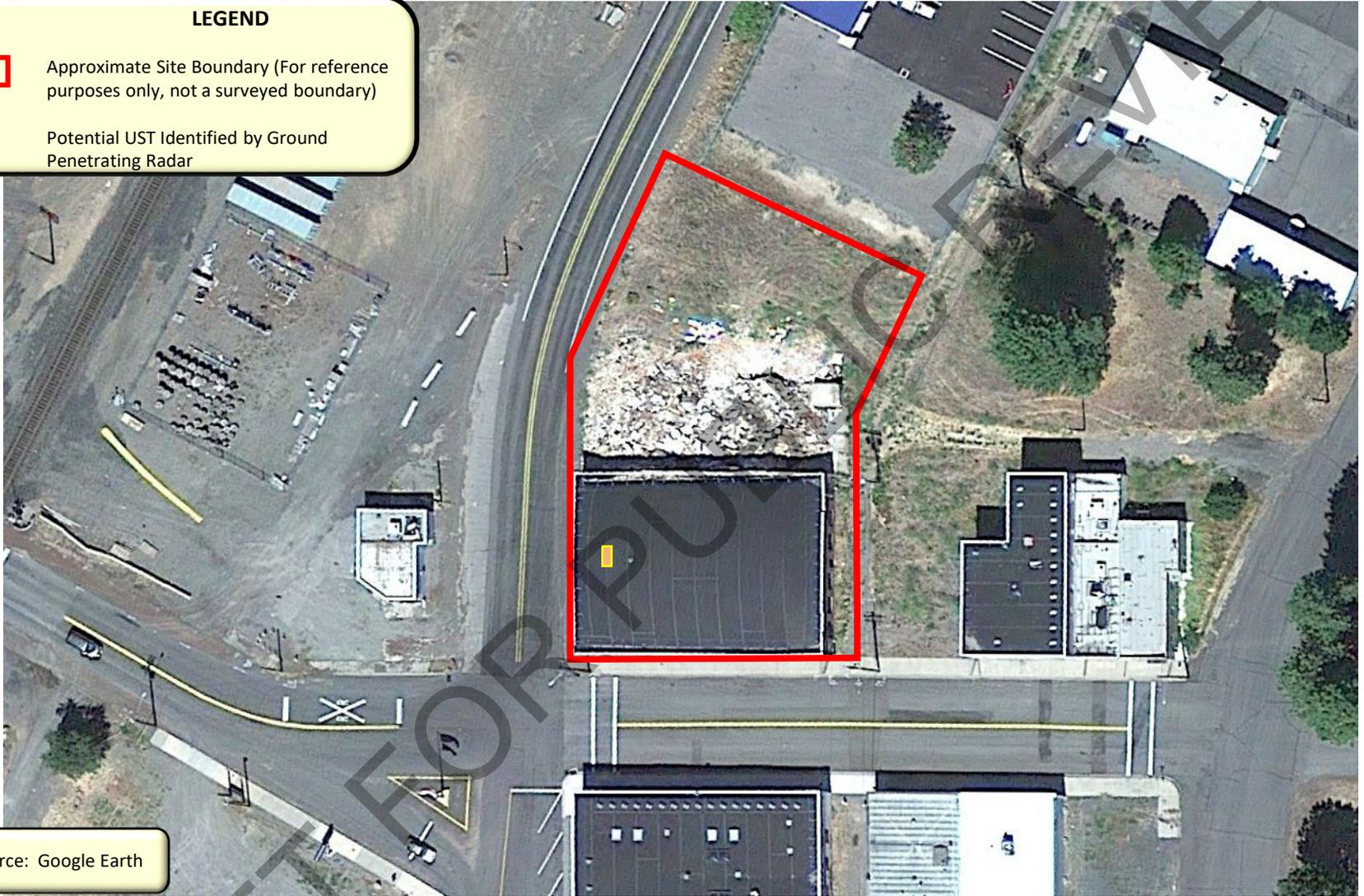
LEGEND



Approximate Site Boundary (For reference purposes only, not a surveyed boundary)



Potential UST Identified by Ground Penetrating Radar



Source: Google Earth



This is not a map of survey.



Map not scaled

Phase II ESA
Former Markwardt Brothers Garage
Chiloquin, Klamath County, Oregon
Cardno Project # CHILOQ100

Figure 5
Potential UST Location Map

FORMER MARKWARDT
BROTHERS GARAGE

TABLES



TABLE 1: SOIL ANALYTICAL SUMMARY
FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, KLAMATH COUNTY, OREGON

RCRA Metals	Soil Boring										Sample Identification										
	Sample Depth (feet bgs)										B-1	B-2	B-3	B-4	B-5	B-6	B-7	B-8	B-9	B-6 DUP	
	Sample Date										08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021	08.17.2021
	Residential Receptor Scenario				Occupational Receptor Scenario				Construction Worker Receptor Scenario	Excavation Worker Receptor Scenario	Results presented in mg/kg or parts per million (DETECTIONS ONLY)										
RBC _{ss}	RBC _{so}	RBC _{si}	RBC _{sw}	RBC _{ss}	RBC _{so}	RBC _{si}	RBC _{sw}	RBC _{ss}	RBC _{ss}												
Barium	15,000	NV	NV	*	220,000	NV	NV	*	69,000	>Max	198	182	183	167	202	156	199	170	195	NA	
Chromium	120,000	NV	NV	*	>Max	NV	NV	*	530,000	>Max	26.8	18.0	13.9	16.9	24.0	15.8	14.1	18.7	17.4	NA	
Lead	400	NV	NV	30	800	NV	NV	30	800	800	1.85	119	54.1	4.35	2.11	36.8	58.9	1.20	14.0	NA	
Mercury	23	NV	NV	*	350	NV	NV	*	110	2,900	<0.0569	<0.0556	0.0536	<0.0547	<0.0587	<0.0537	<0.0544	<0.0548	<0.0537	NA	
NWTPH-Dx	RBC_{ss}	RBC_{so}	RBC_{si}	RBC_{sw}	RBC_{ss}	RBC_{so}	RBC_{si}	RBC_{sw}	RBC_{ss}	RBC_{ss}	Results presented in mg/kg or parts per million (DETECTIONS ONLY)										
Diesel Range Organics (C12 - C24)	1,100	>Max	>Max	9,500	14,000	>Max	>Max	>Max	4,600	>Max	<5.69	13.0	<5.05	<5.47	<5.87	111	<5.44	<5.48	<5.37	NA	
Residual Range Organics (>C24)	2,800	>Max	>Max	>Max	36,000	>Max	>Max	>Max	11,000	>Max	<14.2	75.1	17.6	<13.7	<14.7	564	<13.6	<13.7	<13.4	NA	
VOCs	RBC_{ss}	RBC_{so}	RBC_{si}	RBC_{sw}	RBC_{ss}	RBC_{so}	RBC_{si}	RBC_{sw}	RBC_{ss}	RBC_{ss}	Results presented in mg/kg or parts per million (DETECTIONS ONLY)										
1,2,4-Trimethylbenzene	430	>Csat	140	10	6,900	>Csat	>Csat	48	2,900	81,000	<0.0134	<0.0143	0.0176	<0.0130	<0.0186	<0.0169	<0.0169	<0.0149	<0.0163	<0.0164	
Xylenes (total)	1400	>Csat	160	23	25,000	>Csat	>Csat	100	20,000	560,000	<0.0174	<0.0186	0.0581	<0.0170	<0.0242	<0.0218	<0.0219	<0.0194	<0.0211	<0.0214	
SVOCs	No SVOC constituents reported above laboratory method detection limits										BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	NA	
NWTPH-Gx	NWTPH-Gx not reported above laboratory method detection limits										BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL	NA	
PCBs	No PCB constituents reported above laboratory method detection limits										NA	NA	NA	NA	BRL	BRL	BRL	NA	NA	NA	

RBC = Risk-Based Concentration screening value

RBC_{ss} = Soil Ingestion, Dermal Contact, and Inhalation / RBC_{so} = Volatilization to Outdoor Air / RBC_{si} = Vapor Intrusion into Buildings / RBC_{sw} = Leaching to Groundwater

Concentrations in **bold** exceed ODEQ residential and/or occupational RBC(s)

VOC = Volatile Organic Compound

SVOC = Semi-Volatile Organic Compound

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - Gasoline

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Diesel

PCBs = Polychlorinated Biphenyls

RCRA = Resource Conservation Recovery Act

mg/kg = milligrams per kilogram

B = Soil Boring

bgs = below ground surface

BRL = Below Reporting Limits

NA = Not Analyzed

NV = Non-Volatile chemical (no RBC for volatilization pathway)

>Max = The constituent RBC for this pathway is calculated as greater than 1,000,000 mg/kg or 1,000,000 mg/L. Therefore, this substance is deemed not to pose risks in this scenario.

>Csat = The soil RBC exceeds the limit of three-phase equilibrium partitioning. Soil concentrations in excess of Csat indicate that free product might be present.

* = Leaching-to-Groundwater RBCs are not provided in ODEQ RBC generic tables for inorganic chemicals. This pathway is not of concern, and site-specific leaching tests are not recommended.

TABLE 2: GROUNDWATER ANALYTICAL SUMMARY

**FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, KLAMATH COUNTY, OREGON**

RCRA Metals	Temporary Monitoring Well					Sample Identification					
	Sample Date					TMW-1	TMW-2	TMW-3	TMW-4	TMW-5	TMW-3 DUP
	Residential Receptor Scenario		Occupational Receptor Scenario		Construction & Excavation Worker Receptor Scenario	Results presented in µg/L or parts per billion (DETECTIONS ONLY)					
	RBC _{wo}	RBC _{wi}	RBC _{wo}	RBC _{wi}	RBC _{we}						
Barium	NV	NV	NV	NV	>S	25.6	60.9	38.3	9.10	91.9	NA
Chromium	NV	NV	NV	NV	9,400	< 10.0	11.8	< 10.0	< 10.0	14.0	NA
Lead	NV	NV	NV	NV	>S	< 6.0	< 6.0	26.7	< 6.0	< 6.0	NA
NWTPH-Gx	RBC _{wo}	RBC _{wi}	RBC _{wo}	RBC _{wi}	RBC _{we}	Results presented in µg/L or parts per billion (DETECTIONS ONLY)					
Gasoline Range Organics (C7 - >C12)	>S	22,000	>S	>S	14,000	159 B	115 B	< 100	< 100	< 100	NA
VOCs	No VOC constituents reported above laboratory method detection limits					BRL	BRL	BRL	BRL	BRL	BRL
NWTPH-Dx	No NWTPH-Dx constituents reported above laboratory method detection limits					BRL	BRL	BRL	BRL	BRL	NA
PCBs	No PCB constituents reported above laboratory method detection limits					NA	NA	NA	NA	BRL	NA
SVOCs	No SVOC constituents reported above laboratory method detection limits					BRL	BRL	BRL	BRL	BRL	NA

RBC = Risk-Based Concentration screening value

RBC_{wo} = Volatilization to Outdoor Air / RBC_{wi} = Vapor Intrusion into Buildings / RBC_{we} = Occupational Contact with Groundwater in Excavation

Concentrations in **bold** exceed ODEQ residential and/or occupational RBC(s)

VOC = Volatile Organic Compound

SVOC = Semi-Volatile Organic Compound

NWTPH-Gx = Northwest Total Petroleum Hydrocarbons - Gasoline

NWTPH-Dx = Northwest Total Petroleum Hydrocarbons - Diesel

PCBs = Polychlorinated Biphenyls

RCRA = Resource Conservation Recovery Act

µg/L = micrograms per liter

TMW = Temporary Monitoring Well

bgs = below ground surface

BRL = Below Reporting Limits

NA = Not Analyzed

NV = Non-Volatile chemical (no RBC for volatilization pathway)

B = Analyte present in associated method blank

>S = The constituent RBC for this pathway is calculated as greater than constituent solubility in groundwater (i.e. present in subsurface as undissolved or "free product"/"Non-Aqueous Phase Liquid")

TABLE 3: SUMMARY OF BULK SAMPLE ANALYSIS

FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, KLAMATH COUNTY, OREGON

HA ID	Date	HA Description	Material Location	Percent and Type of Asbestos Detected ¹	Estimated Quantity	Type of ACM ²	Friability ³	Physical Condition
RP-01-01	8/18/21	Shingles	Rubble pile (east)	NAD	N/A	N/A	NF	Poor
RP-01-02	8/18/21	Shingles	Rubble pile (north)	NAD	N/A	N/A	NF	Poor
RP-02-01a	8/18/21	Drywall (White texture w/ paint)	Rubble pile (west)	2% CH		Misc. Cat 1	F	Poor
RP-02-01b	8/18/21	Drywall (Cream tape)	Rubble pile (west)	NAD	N/A	N/A	F	Poor
RP-02-01c	8/18/21	Drywall (White joint compound)	Rubble pile (west)	2% CH		Misc. Cat 1	F	Poor
RP-02-01d	8/18/21	Drywall (White drywall w/ brown paper)	Rubble pile (west)	NAD	N/A	N/A	F	Poor
RP-02-02a	8/18/21	Drywall (Cream tape)	Rubble pile (north)	NAD	N/A	N/A	NF	Poor
RP-02-02b	8/18/21	Drywall (White joint compound)	Rubble pile (north)	2% CH		Misc. Cat 1	F	Poor
RP-02-02c	8/18/21	Drywall (White drywall w/ brown paper)	Rubble pile (north)	NAD	N/A	N/A	NF	Poor
RP-03-01	8/18/21	Gray caulk	Rubble pile (west)	NAD	N/A	N/A	NF	Poor
RP-03-02	8/18/21	Gray caulk	Rubble pile (east)	NAD	N/A	N/A	NF	Poor

Notes:

(1) CH = Chrysotile; AM = Amosite; CR = Crocidolite; AN = Anthophyllite; AC = Actinolite; NAD = No Asbestos Detected

(2) Misc = Miscellaneous; TSI = Thermal System Insulation; SM= Surfacing Material

(3) F = Friable; NF - Non friable. For ACMs only: I = Non-Friable Category I; II = Non-Friable Category II

NM - not measured

LF = linear feet PACM = Presumed Asbestos-Containing Materials

n/a - not applicable

SF = square feet CY = Cubic Yards

Samples in **Bold** and yellow highlight contain asbestos above the regulatory threshold of 1%

TABLE 4: SUMMARY OF TOXICITY CHARACTERISTIC LEACHING PROCEDURE

**FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, KLAMATH COUNTY, OREGON**

Sample ID	Date	Location	Result (Lead)	Estimated Quantity	Physical Condition
RP-01	8/18/21	Rubble pile (east)	BRL	N/A	Deteriorated
RP-02	8/18/21	Rubble pile (west)	BRL	N/A	Deteriorated

Notes:

NM = not measured

BRL = Below Laboratory Reporting Limit

N/A = not applicable

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TABLE 5: GROUNDWATER DEPTH SUMMARY

**FORMER MARKWARDT BROTHERS GARAGE
CHILOQUIN, KLAMATH COUNTY, OREGON**

Well Number	Measurement Date	Depth of Well (ft btc)	Depth to Water (ft btc)
TMW-1	8/18/2021	13.00	10.51
TMW-2	8/18/2021	14.47	10.11
TMW-3	8/18/2021	11.43	9.59
TMW-4	8/18/2021	14.80	10.62
TMW-5	8/18/2021	13.28	10.08

ft btc = Feet Below Top of Casing

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About Cardno

Cardno is an ASX-200 professional infrastructure and environmental services company, with expertise in the development and improvement of physical and social infrastructure for communities around the world. Cardno's team includes leading professionals who plan, design, manage, and deliver sustainable projects and community programs. Cardno is an international company listed on the Australian Securities Exchange [ASX:CDD].

Cardno Zero Harm

Cardno
**ZERO
HARM**
EVERY JOB. EVERY DAY.

At Cardno, our primary concern is to develop and maintain safe and healthy conditions for anyone involved at our project worksites. We require full compliance with our Health and Safety Policy Manual and established work procedures and expect the same protocol from our subcontractors. We are committed to achieving our Zero Harm goal by continually improving our safety systems, education, and vigilance at the workplace and in the field. Safety is a Cardno core value and through strong leadership and active employee participation, we seek to implement and reinforce these leading actions on every job, every day.