Fort Belknap Brownfields Tribal Response
Phase II Environmental Site Assessment Report
Lodgepole Community Hall

Prepared for:

Fort Belknap Indian Community
Fort Belknap Indian Reservation
Environmental Protection Department
R.R. 1, Box 66
Fort Belknap Agency
Harlem, MT 59526

Prepared by:

Portage Environmental, Inc.
1065 N. Ewing
Helena, MT 59601

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FORT BELKNAP BROWNFIELDS TRIBAL RESPONSE PROGRAM
PHASE II ESA REPORT – LODGEPOLE COMMUNITY HALL

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ASTM	American Society for Testing and Materials
ACM	asbestos containing material
AHERA	Asbestos Hazard Emergency Response Act
AST	aboveground storage tank
BTEX	benzene toluene ethylbenzene xylene
CDC	Center for Disease Control
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CMP	corrugated metal pipe
DRO	diesel range organics
EPA	U.S. Environmental Protection Agency
EPH	extractable petroleum hydrocarbons
ESA	Environmental Site Assessment

FBEPD	Fort Belknap Environmental Protection Department
FBIC	Fort Belknap Indian Community
FSP	Field Sampling Plan
GRO	gasoline range organics
HASP	Health and Safety Plan
HUD	U.S. Department of Housing and Urban Development
IDW	investigation derived waste
LBP	lead based paint
LPCH	Lodgepole Community Hall
MTBE	methyl tert butyl ether
NESHAP	National Emissions Standards for Hazardous Air Pollutants
ORP	oxidation reduction potential
PAH	polycyclic aromatic hydrocarbon
PCM	point count method
PCOC	potential contaminants of concern
PLM	polarized light microscopy
PQL	practical quantitation limit
PRG	Preliminary Remediation Goals
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
RBSL	Risk Based Screening Level
RCRA	Resource Conservation and Recovery Act
REC	recognized environmental conditions
RPD	relative percent difference
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
TSCA	Toxic Substances Control Act
VOC	volatile organic compound
VPH	volatile petroleum hydrocarbons

EXECUTIVE SUMMARY

Portage Environmental, Inc. (Portage) was contracted by the Fort Belknap Indian Community (FBIC) to perform a Phase II Environmental Site Assessment (ESA) for the Lodgepole Community Hall (LPCH). The Phase II ESA is funded by a Brownfields Tribal Response Grant, administered by the United States Environmental Protection Agency (EPA).

The LPCH is located adjacent to the former Lodgepole Elementary School and Tribal Route #8, in Lodgepole, Montana. LPCH was built in the 1930's and used primarily for community events until its closure in the early 1990's.

The Phase II ESA sampling efforts focused upon identifying the presence or absence of potential contaminants of concern associated with the onsite aboveground storage tank (AST) as well as three off-site underground storage tanks. Soils and groundwater were sampled and analyzed to determine if any past spills or leaks could affect site redevelopment. Contaminants of concern were identified in earlier Phase I and current Phase II ESAs performed by Tetra Tech (July 2006), formerly known as Maxim Technologies, and Portage (September 2007), respectively. The results obtained by Tetra Tech during the Phase I investigation and by Portage during the Phase II ESA will be incorporated to support decisions regarding further site assessments and/or corrective actions, and future property use.

A Phase II ESA Work Plan was prepared for the LPCH based on recommendations found within the Phase I ESA prepared by Tetra Tech and concerns outlined by the Fort Belknap Environmental Protection Department. Specific recommendations included conducting a subsurface soil investigation subjacent to the onsite aboveground storage tank, soil sampling within the abandoned corrugated metal wells, and performance of a groundwater sampling effort. The Phase I ESA also recommended a complete inspection for suspected hazardous materials (ACM and LBP) on both the interior and exterior of the building.

The Phase II ESA Work Plan was implemented during September 2007. Six soil samples were collected adjacent to the AST, three soil samples were collected from the abandoned corrugated metal pipe (CMP) wells, and three groundwater samples were collected from an onsite water well. Samples submitted for laboratory testing were analyzed for the potential contaminants of concern (EPH, VPH, and Pb). Duplicate soil and groundwater samples were collected and analyzed for potential contaminants of concern for the purpose of quality control.

Sampling and analysis results for LPCH soils adjacent and subjacent to the AST indicated minimal contamination, with some soils samples exceeding preliminary screening levels for EPH. However, soils surrounding the AST did not exceed risk-based screening levels following fractionation. Lower contaminant concentrations at depth in conjunction with decreased PID field screening levels distal to the AST suggest that contamination surrounding the AST is localized and limited horizontally and vertically. CMP2 surface soil exhibited levels of EPH, VPH, and metals contamination. Only one sample, CMP2-3, exceeded risk-based screening levels for soil contaminants (EPH and lead). It is recommended that contaminated soils exceeding risk-based screening levels be removed and disposed of at a RCRA Subtitle D Landfill (i.e., Hill County Landfill, Havre, Montana), provided the soils meet the landfill's waste

acceptance criteria. Existing CMPs should be abandoned in compliance with existing state requirements.

Groundwater sample results for the well sampled (located up-gradient of the off-site USTs and down-gradient of from the AST and culvert wells) were free of any contamination associated with EPH, VPH, and metals analysis. The absence of contamination within the groundwater near the Lodgepole Community Hall suggests that contaminants have not migrated from soils to groundwater.

Physical controls are recommended at this time to prevent public access and use prior to complete site cleanup and restoration. Appropriate methods to reduce the likelihood of unwarranted access to the entire site could include temporary fencing or other necessary barriers, signage indicating hazards, and public notices. Ultimately, the LPCH restoration goals are attainable, given the removal of the AST and CMPs (and associated contaminated soils), as well as the abatement and disposal of building materials containing asbestos or lead.

1.0 INTRODUCTION

This Phase II Environmental Site Assessment (ESA) report was prepared by Portage Environmental, Inc. (Portage) for the Fort Belknap Indian Community (FBIC) of the Fort Belknap Indian Reservation, North Central Montana. The Fort Belknap Indian Reservation is home to the Gros Ventre and Assiniboine Tribes, and is governed by FBIC Council members.

The Phase II ESA was conducted under a Brownfields Tribal Response Grant awarded to FBIC by the United States Environmental Protection Agency (EPA). The Fort Belknap Brownfields Tribal Response Program is being administered locally by the Fort Belknap Environmental Protection Department (FBEPD), with general oversight and federal administration by the EPA in Helena, Montana. All ESA work is designed to meet federal requirements for work funded by an EPA Brownfields Grant, with work plans submitted to EPA and FBEPD for review and approval.

Previous studies were conducted under the Brownfields Tribal Response Program. Tetra Tech completed a Phase I ESA, and collected sampling data relevant to the Phase II ESA. The site is the Lodgepole Community Hall (LPCH), in Lodgepole, located adjacent to the former Lodgepole Elementary School and Tribal Route #8, lying within Section 5, Township 26 North, Range 25 East (Figure 1). The LPCH was built in the 1930's and was used primarily for community events until its closure in the early 1990's. Veteran's Park lies within the site boundary. The site is developed with picnic tables, awnings, and a wooden fence along three sides of the property. A chain-link fence separates the site from the former Lodgepole Elementary School to the north.

Phase I of the project, conducted by Tetra Tech, involved a comprehensive review of available site data, site inspections, and reporting. The purpose of the Phase I ESA was to disclose factual environmental data and information in existence and identify Recognized Environmental Conditions (REC). Phase II ESA work, described in the 2006 ESA Report (Tetra Tech) and this report, involved sampling and analysis of groundwater, soil, and building materials to further investigate the RECs identified in Phase I work and determine if EPA Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) hazardous substances are present. Future Phase III work will be based on Phase II ESA findings and consultation with the Fort Belknap Environmental Protection Department (FBEPD) and EPA, and could include limited risk assessment and/or development of alternatives and costs for proposed corrective actions and future site uses.

The Phase I ESA was conducted and reported in the years 2006 and 2007 by Tetra Tech. Results from the ESA indicated that additional data was needed to better define the extent of contaminants of concern. During Phase I activities, Tetra Tech gathered asbestos containing material (ACM) and lead based paint (LBP) data relevant to the Phase II ESA. The data and information collected by Tetra Tech is incorporated within this report. The Phase II ESA, conducted by Portage Environmental, Inc., began in September 2007 under the Brownfields Tribal Response Program. This report describes the purpose, procedures, and findings associated with the LPCH Phase II ESA.

Figure 1. Project Location

1.1 Purpose

The purpose of the Phase II ESA was to further investigate RECs and potential contaminants of concern identified within the earlier Phase I ESA report (Tetra Tech, 2006 and 2007). Specifically, the purpose of Phase II work was to gather data with which to verify the presence or absence of CERCLA hazardous substances that may exceed published limits within primary exposure pathways (soil and water) at the LPCH.

A Phase II ESA Work Plan (Portage, 2007) including a Quality Assurance Project Plan (QAPP), Field Sampling Plan (FSP), and Health and Safety Plan (HASP), was used as the basis for all Phase II ESA activities. The QAPP contains the required information for approval by EPA and follows EPA 540-R-98-038 *Quality Assurance Guidance for Conducting Brownfields Site Assessments*. The FSP includes key components for sampling and data gathering found in American Society for Testing and Materials (ASTM) Designation: E 1903 – 97 *Standard Guide for Environmental Site Assessments: Phase II Environmental Site Assessment Process* as well as in EPA 540-G-89-004 *Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA*. Combining the QAPP and FSP into the Phase II Work Plan essentially constitutes a SAP as defined by CERCLA guidance. The Work Plan also included a project-specific HASP following regulations promulgated under OSHA 29CFR 1910.120 *Hazardous Waste Operations and Emergency Response*.

The key tasks completed for the Phase II ESA included the following:

- Develop a Phase II ESA Work Plan to implement earlier recommendations;
- Sample soils at biased locations to determine if contaminants are present;
- Sample groundwater to determine if contaminants are present.

Additional detail on the development of these tasks, project organization, and problem definition including descriptions of conceptual models and sampling rationale for LPCH is found in the Phase II ESA Work Plan (see Appendix A). The Work Plan also includes descriptions of all Standard Operating Procedures (SOPs) for Quality Assurance/Quality Control (QA/QC) and for sampling and handling protocols. The subsequent sections of this Phase II ESA report describe the activities, results and analyses of data collected from Phase II ESA work. These are presented under the main category headings as follows:

- Lodgepole Community Hall Background
- Phase II Activities
- Evaluation and Presentation of Results
- Conclusions and Recommendations
- References

2.0 LODGEPOLE COMMUNITY HALL BACKGROUND

This section provides background information for the Lodgepole Community Hall, including site description and physical setting, site history and summary of previous assessments, and adjacent property land use.

2.1 Site Description and Physical Setting

The Lodgepole Community Hall (LPCH) is located on property owned by FBIC in Lodgepole, Section 5, T26N, R25E, Principal Montana Meridian, Blaine County, Montana (Figure 1). The site is situated adjacent to Tribal Route #8, west of Lodgepole Creek, and immediately south of the former Lodgepole Elementary School. The site contains Veteran's Park, with associated picnic tables and awnings. The LPCH sits at an elevation of approximately 3,520 feet above mean sea level within the narrow valley of Lodgepole Creek.

The LPCH is located on terrain that ranges from relatively flat to rolling foothills at the base of the Little Rocky Mountains. Site surface water drains eastward, towards Lodgepole Creek. Soils consist of alluvial parent material that is well drained with moderately high water movement within the most restrictive layer. Depth to a restrictive root layer is greater than 60 inches, with water highly available within this zone. Soils can be characterized as Straw-Korent loams and Typic Ustifluvents (wet soil series), ranging from clay loam to silty-clay loam to sandy-clay loam according to the United States Department of Agriculture.

The water table is approximately 18 feet below the land surface. According to the FBEPD, the site is not included in the Federal Emergency Management Agency mapped area, nor is the site zoned.

The LPCH has reportedly not been used since the 1990s. Consequently, the area had a relatively thick vegetative cover (prior to mowing) consisting primarily of grasses and scattered weeds. The log-structured building is of single level construction with a total area of approximately 5,000 square feet (excluding the crawl space); interior finishes are primarily of wood lathe and plaster. The building has deteriorated significantly due to adverse conditions, vandalism, use by birds and rodents, and lack of maintenance.

2.2 Site History and Summary of Previous Assessments

The LPCH was used for community events and gatherings for approximately 60 years before closing in the early 1990s. Activities hosted at the LPCH site included powwows, children's programs, sporting events, and dances. The LPCH was built in the 1930's, funded by President Franklin D. Roosevelt's New Deal Program during the Great Depression. On February 24, 2000, the building was listed by the Montana Historical Society in the National Registry of Historic

Places in accordance with the National Historic Preservation Act of 1986. The continuing importance of the LPCH has been indicated by the Fort Belknap Indian Community Council, Lodgepole Senior Cultural Committee, and community residents' intentions to begin preservation and restoration of the building. The Fort Belknap Indian Community has acquired funds to begin the renovation of the site. The primary purpose of the Phase I ESA was to ensure that potential contaminants or environmental health hazards that exist onsite, that may prove harmful to public health or adversely impact the environment associated with the site or adjacent properties, be identified.

2.2.1 2006 Phase I ESA

Tetra Tech conducted a Phase I ESA of the LPCH in accordance with their Sampling and Analysis Plan dated July 18, 2006 and executed agreement dated April 14, 2006. The Phase I work included dissemination and evaluation of user provided information, site description, records review, site reconnaissance, and proposition of conclusions and recommendations. Portage Environmental, Inc. was provided all pertinent documentation, communication, reports, and data relevant to the Phase I ESA by the FBEPD. Additional data related to the Phase I ESA was obtained by Portage from Tetra Tech by purchase agreement.

FBEPD indicated that they were not aware of any indicators or contaminants associated with the site, but were aware that the former Lodgepole Elementary School had underground storage tanks removed in 1999. Review of the Montana Registered UST Listings confirmed the registration of three UST's on the adjoining property where the former Lodgepole Elementary School is located. The UST's included one 1,000-gallon gasoline tank, one 2,500-gallon diesel fuel oil tank, and one 10,000-gallon diesel fuel oil tank. Pine Street, Inc. submitted tank closure forms on June 9, 2006 to the MDEQ stating the tanks were closed and removed from the ground on June 10, 1999. MDEQ's data base for regulated UST's currently lists the three tanks as permanently out of use. Soil samples collected by MDEQ personnel and analyzed by Maxim's laboratory for gasoline range organics (GRO) and diesel range organics (DRO) revealed contaminant concentrations below conservative MDEQ risk-based screening levels for subsurface soils. Based on information in the MDEQ database, the vertical and horizontal extent of contamination from the three tanks was defined, and the source of contamination was removed. The petroleum release site was closed by MDEQ on February 24, 2000.

During site reconnaissance one aboveground heating oil storage tank was identified onsite. The tank appeared to be in good condition, but heavy vegetation under and around the tank prevented observation of soil staining or other indicators of petroleum contamination. The condition of the underground piping associated with the AST was not observed. Four AST's that appeared to be in use were noted on the adjoining former Lodgepole Elementary School site.

On the northwest side of the building, two vertical corrugated metal pipes (CMPs) were observed that were approximately 2 feet in diameter and buried to an unknown depth. The pipes were filled with debris and garbage, preventing observation of the bottom of the pipes. Information obtained from the FBEPD indicated that at least one of the structures was installed to develop a spring and contains a pump and wiring at the base of the well, while the second structure was likely installed for the same purpose, but lacks the associated pump and wiring.

Review of the Montana Closed Solid Waste Disposal Facility Listings indicated the existence of one closed landfill located within ½ mile of the LPCH. Information from the FBEPD Brownfields Tribal Response Program public records information site inventory indicated that the Lodgepole Dump operated from the early 1950's to the early 1980's, accepting waste generated by residential, tribal, and school district sources. The area of the landfill is approximately eight acres. The current use of the landfill is for livestock grazing as well as collection of appliances and junk vehicles. The Lodgepole Dump had originally been listed as an unlicensed open burning dump by MDEQ's Solid Waste Division. The dump was closed at some time prior to December 31, 1991. The state does not have records of any environmental investigation of the site.

Phase I ESA recommendations used as the basis for the Phase II ESA work are as follows:

- A subsurface investigation is warranted in order to confirm the absence or presence of environmental impairment to the site from historic storage and dispensing of petroleum products from the onsite AST and related underground piping.
- Soil sampling should be performed subjacent to the two vertical corrugated pipes, likely used for spring development, to determine whether the soil has been impacted by inappropriate disposal practices or by migrating petroleum contaminants.
- Sampling of groundwater should be performed to determine whether subsurface impacts are present due to past activities at the site or at up gradient locations. Following groundwater sampling, the two unused wells to the north and northeast of the LPCH should be properly abandoned to protect the aquifer from potential introduction of chemical or biological contamination from the surface.

2.2.2 Limited 2006 Phase II ESA Activities

Site reconnaissance conducted during Maxim's Phase I onsite investigation included Phase II ESA sampling activities for ACM and LBP contamination. The onsite investigator identified two homogenous areas of ACM as well as nine homogenous areas of LBP. The ACM homogenous areas are located on the kitchen counter tile and sink undercoating. The LBP homogenous areas include numerous doors, trim, and wall panels. Twenty-one bulk material samples were collected for asbestos analysis, while 66 samples were collected for LBP analysis using an X-ray fluoroscope. Results relating to ACM and LBP are presented within section *4.0, Evaluation and Presentation of Results*.

2.3 Adjacent Property Land Use

The Lodgepole Community Hall is located on the southern edge of the community of Lodgepole on property owned by FBIC. The site has been in tribal ownership dating back to the inception of the reservation in 1888. Neighboring properties include:

- The former Lodgepole Elementary School lies to the north of the LPCH. This property has four aboveground petroleum storage tanks that appear to be in good condition. The property also had three USTs removed on June 10, 1999.
- The West-bank access road, Lodgepole Creek, and farmland lie to the east of the LPCH.
- An abandoned wood cabin, open fields, and Tribal Route #8 lie to the south of the site.
- A vacant fire station, open fields, and a small residential area are to the west of the LPCH.

3.0 PHASE II ACTIVITIES

The principal objective of the Phase II Environmental Site Assessment was to gather sufficient data with which to verify the presence or absence of hazardous substances that exceed published limits within primary exposure pathways (soil and water) at the Lodgepole Community Hall. This was accomplished by developing a work plan, performing field investigations, analyzing samples for potential contaminants of concern, performing data validation and evaluation, and reporting the results.

The field portion of the investigation was completed in two visits to the LPCH. The first, performed by Tetra Tech, occurred on July 20, 2006 and consisted of identification and sampling of homogenous areas containing ACM and LBP. The second, performed by Portage Environmental, Inc., took place September 26 - 27, 2007 and consisted of collecting surface and subsurface soil samples and groundwater samples in order to analyze for potential contaminants of concern.

Phase II ESA activities followed the FSP based on the conceptual model of the LPCH site (refer to Section 3.1.2). The scope of the assessment and methodologies used for the Phase II activities are described in the sections below. Further details on the scope of assessment are found in the Fort Belknap Brownfields Tribal Response Phase II Work Plan Lodgepole Community Hall (Portage, 2007).

3.1 Scope of Assessment

The following sections describe the scope of the Phase II ESA.

3.1.1 Record Review

The scope of the Phase II ESA included review of previous ESA reports showing analytical results of ACM and LBP samples collected at LPCH, documents and photographs on file with and in ownership of the FBEPD, and other literature describing geological and hydrological

conditions on the Fort Belknap Indian Reservation. These materials are referenced as appropriate in this Phase II ESA report.

3.1.2 Conceptual Site Model and Sampling Plan

The Lodgepole Community Hall conceptual site model (for areas outside the building) includes:

Potential Source of Contamination: The potential source of contamination is petroleum contaminated soil.

Possible Migration Pathways:

- Soil to soils: Contaminants found in soils may migrate to surrounding soils.
- Contaminated soils to groundwater: Contaminants may migrate from contaminated soils to groundwater.
- Contaminated groundwater to wells: Contaminants may migrate down-gradient from contaminated groundwater to onsite wells.

Possible Exposure Pathways:

- Direct dermal contact with contaminated soils. Human direct contact would most likely occur during construction/renovation or possibly during use of the contaminated areas.
- Ingestion of contaminated soils or groundwater. Ingestion of contaminants could occur by direct ingestion of contaminated soils or drinking. Such ingestion could take place during construction/renovation, or during recreational use of the property.

Receptors of Concern: Humans may be exposed to contaminants through direct contact with surface soils, direct ingestion of surface soils, or by ingestion of contaminants by drinking water from the onsite well(s). Additionally, construction workers may be exposed to contaminants by contact with both surface and subsurface soils.

The sampling design for the Lodgepole Community Hall is focused on investigating for the presence or absence of contaminants in surface and subsurface soils, and whether such contamination has migrated to groundwater (a drinking water source). The sampling design therefore involves two steps: sampling surface and subsurface soils for potential contamination, and then sampling groundwater wells for potential contaminants of concern.

3.1.3 Phase II ESA Sampling Plan

Environmental sampling data collected for the Phase II ESA at the LPCH was evaluated based on the following:

- Comparison of LPCH soil data with EPA Region 9 Preliminary Remediation Goals, DEQ Tier 1 Surface and Subsurface Risk Based Screening Levels, and DEQ Soil Action Levels for Petroleum Releases Revised Technical Document #7;
- Comparison of groundwater data with Circular DEQ-7, *Montana Numeric Water Quality Standards*, January, 2002 specified limits, DEQ Tier 1 Groundwater Risk Based

Screening Levels and Standards, and DEQ Groundwater Action Levels for Petroleum Releases Revised Technical Document #7; and
- Comparison with any Tribal soil or water quality standards that have been developed by FBIC.

The specific sampling objectives for each site are described below.

- Examine the extent of contamination of surface soils at three locations surrounding the aboveground storage tank on the west side of the LPCH.
- Sample subsurface soil in the vicinity of the outlet piping/fittings by the aboveground storage tank for potential contaminants of concern (PCOC).
- Collect surface soil samples from the two wells encased by corrugated metal pipe culverts near the northwest corner of the LPCH for PCOCs.
- Collect groundwater samples from the two wells to the north of the Lodgepole Community Hall and analyze for PCOCs.

These objectives were defined to determine if exposure pathways (as discussed in Section 3.3) were present. The sampling and analytical budget for the project is limited and therefore a limited number of samples will be submitted for analysis. Only those locations that the FBIC and Portage believed to be impacted were sampled for laboratory analysis.

3.1.4 Chemical Testing Plan

The chemical analytes for LPCH samples included PCOCs associated with petroleum releases. Soil and sediment samples were initially screened using a photoionization detector (PID) prior to submission for laboratory analysis. Soils and groundwater were tested for the following analytes:

- Extractable Petroleum Hydrocarbons (EPH);
- Volatile Petroleum Hydrocarbons (VPH); and
- Lead (Pb).

Soil and Groundwater samples analyzed for EPH and VPH were subjected to testing in accordance with *Montana DEQ Revised Technical Guidance Document #7: Soil and Groundwater Action Levels for Petroleum Releases under the DEQ Release Section*. Per the guidance, if concentrations exceed investigatory limits for site assessments, then the samples must be submitted for fractionation and polycyclic aromatic hydrocarbon (PAH) analysis including EPA Method 8021 or 8260 (soils), and EPA Method 8270 (groundwater).

Groundwater field parameters measured in the field included oxidation reduction potential (ORP-V), pH, dissolved oxygen, % dissolved oxygen, specific conductance, and temperature.

Additionally, building materials were investigated and samples were collected for analysis of ACM and LBP by Tetra Tech staff.

3.1.5 Field Explorations and Methods

Field explorations for the Phase II ESA included surface soil sampling, test pit excavation, testing of groundwater wells, and groundwater sampling. The specific types of field explorations and methods are described below.

Surface Soil Sampling: Surface soil samples were collected from six locations adjacent to the AST. Three samples were submitted for laboratory analysis, while the three remaining surface soil samples collected near the AST were used solely for the purpose of characterizing the extent of contamination by visual observation and PID screening. One soil sample was collected from the surface soil found at the bottom of each of the corrugated metal pipes. An additional quality control duplicate was also collected from CMP-1. Hand tools were used to collect and containerize the samples. All soil samples were collected in accordance with SOP No. 4 of the Work Plan.

Subsurface Soil Sampling: One test pit was excavated immediately north of the AST, near its outlet piping. The test pit was excavated using a John Deere 490E tracked excavator. The pit was excavated by first removing and segregating the upper soil cover and placing this material to one side of the excavation, then excavating down to the desired sampling depths. Three subsurface soil samples were collected from the excavated pit, including one quality control duplicate. Samples were collected from the vertical face of the pit nearest the AST at the desired sampling depths using hand tools.

Testing Groundwater Wells: Limited tests were conducted on Groundwater Well #2, located north of the LPCH. Testing consisted of purging the well using and electric pump operated from the former Lodgepole Elementary School and measuring recovery rates. Purges were performed in order to ensure the well had been purged three full volumes and to allow water quality parameters to stabilize prior to collection of groundwater samples. Recovery rates were measured by using an electric water level indicator and watch.

Groundwater Sampling: Groundwater samples were collected for laboratory analyses of PCOCs and for measurement of field parameters. Prior to collecting groundwater samples from the well, it was first purged using the existing electric pump within the well. Water quality parameters were allowed to stabilize prior commencement of sampling. This was accomplished by partially purging Water Well #2 until water quality parameters reached acceptable stabilities. Water quality parameters observed included pH, temperature, dissolved oxygen, percent dissolved oxygen, conductivity, and ORP-V. A Troll 9500 In-Situ Inc. Multi-parameter Water Quality Meter (SN# 108138), provided by the Fort Belknap Community College, was used for measuring groundwater field parameters.

3.1.6 Field Documentation

Field activity documentation included a field logbook and site photographs (Appendix B). Field logbook notes were kept for all soil and water sampling activity. The logbook provides a written record for all field data gathered, field observations, and samples collected for laboratory analysis. The logbook also ensures that field activities are properly documented and that site

work was conducted in accordance with the Phase II ESA Work Plan. All soil sampling locations at the LPCH were documented using digital photographs to provide a visual record. Photographs were noted in the field logbook photolog.

3.1.7 Management of Investigation Derived Waste

Investigation derived waste (IDW) was managed according to the procedures described in the Phase II ESA Work Plan. Examples of investigation derived waste include decontamination fluids, personal protective equipment (PPE), and disposable sampling equipment. No RCRA regulated solvents or materials were used. PPE and disposable sampling equipment were disposed of as municipal solid waste.

Soils excavated at LPCH were backfilled and graded to promote positive drainage away from the test pit or sampling site. Topsoil was segregated during excavation and replaced as the surface soil layer. Soils from decontamination of the excavator hoe bucket and all other tools used for soil sampling were placed back into the original area from where they were collected. Minimal fluids were used for the purpose of decontamination. Fluids that were used were collected using absorbent materials and disposed according to the Work Plan.

3.2 Environmental Media Samples and Chemical Analyses

The following sections describe the samples collected and chemical analyses for soil, groundwater, ACM, and LBP at the Lodgepole Community Hall. Soil and groundwater sample collection followed the LPCH Phase II Work Plan procedures, as described in Section 3.1. ACM and LBP sample collection adhered to Tetra Tech's *Sampling and Analysis Plan for Asbestos and Lead Inspection, Former Gymnasium and Community Center, Fort Belknap Brownfields Tribal Response Program, Lodgepole, Montana*. Sample designations and analytical parameters for the LPCH Phase II ESA are shown on Table 1. Specific sample handling requirements for soil and groundwater samples, and relevant SOPs, used for sample collection and handling are in the LPCH Phase II ESA Work Plan. General sampling locations can be seen on Figure 2.

Table 1. Soil and Groundwater Sampling Analytical Parameters - LPCH

Sample Identification for FBIC Lodgepole Community Hall Phase II Environmental Site Assessment				
Sample ID	*Sample Location*	*Media*	*Depth*	*Analyses*
Aboveground Storage Tank – Subsurface Soil Samples				
LPCH-AST-SS3	AST, Near Outlet	Soil	1 foot below ground surface	EPH, PID Screen
LPCH-AST-SS4	AST, Near Outlet	Soil	2 feet below ground surface	EPH, PID Screen
Aboveground Storage Tank – Perimeter Surface Soil Samples				
LPCH-AST-S1	AST, Near Outlet (North)	Soil	2 - 6 inches below ground surface	EPH, PID Screen
LPCH-AST-S1´	AST, 3 ft North of LPCH-AST-S1	Soil	2 - 6 inches below ground surface	PID Screen
LPCH-AST-S2	AST, East	Soil	2 - 6 inches below ground surface	EPH, PID Screen
LPCH-AST-S2´	AST, 2 ft East of LPCH-AST-S2	Soil	2 - 6 inches below ground surface	PID Screen
LPCH-AST-S3	AST, West	Soil	2 - 6 inches below ground surface	EPH, PID Screen
LPCH-AST-S3´	AST, 2 ft West of LPCH-AST-S3	Soil	2 - 6 inches below ground surface	PID Screen
CMP #1 (West)				
LPCH-CMP1-1	Within CMP #1	Soil	Ground surface at bottom of CMP	PID Screen
LPCH-CMP1-3	Within CMP #1	Soil	Ground surface at bottom of CMP	VPH, EPH, Pb
CMP #2 (East)				
LPCH-CMP2-1	Within CMP #2	Soil	Ground surface at bottom of CMP	PID Screen
LPCH-CMP2-3	Within CMP #2	Soil	Ground surface at bottom of CMP	VPH, EPH, Pb
Water Well #2 (North of Hall)				
LPCH-W2-1	Lodgepole Elementary School Tap	Water	Well Water from 28-33 ft bgs	VPH, EPH, Pb
Quality Control Samples - Duplicates				
LPCH-AST-SS5	AST, Near Outlet	Soil	1 foot below ground surface	EPH
LPCH-CMP1-4	Within CMP #1	Soil	Ground surface at bottom of CMP	VPH, Pb
LPCH-W2-2	Lodgepole Elementary School Tap	Water	Well Water from 28-33 ft bgs	VPH, EPH, Pb

3.2.1 Surface Soil

A total of six surface soil grab samples were collected in undisturbed areas around the northern perimeter of the AST. Three sample locations were directly adjacent to the tank, located at the exit of the piping leading to the Hall (LPCH-AST-S1), on the northeast corner of the tank perpendicular to the tank's access cap (LCPH-AST-S2), and on the northwest corner of the tank, again, perpendicular to the tank's access cap (LPCH-AST-S3). Three additional sampling locations were collected for the purpose of characterizing the extent of contamination by visual examination and PID monitoring. The additional field screening samples were labeled LPCH-AST-S1′, LPCH-AST-S2′, and LPCH-AST-S3′. The locations of the additional field screening sample sites were located approximately two to three feet outward from the original sample locations. All samples were collected by first removing the uppermost 1 to 2 inch organic layer, then obtaining representative soil material within the next one to four inches in depth (i.e. sample interval between 2 and 6 inches below the land surface). Following collection using stainless steel scoops, samples were placed in individual plastic bags in order to obtain PID field screening measurements.

A total of three surface samples, including one duplicate sample, were collected from the CMPs. Samples LPCH-CMP1-3 and LPCH-CMP1-4 (duplicate) were collected from the western-most corrugated metal pipe (CMP1). Sample LPCH-CMP2-3 was collected from the eastern-most corrugated metal pipe, closest to the Hall (CMP2). Additional samples from these locations, originally shown in the Work Plan, were omitted due to the difficulty of obtaining viable media from the ground surface at the bottom of the corrugated metal pipes. Media collected from CMP1 consisted mostly of decaying wood, minimal refuse, widely-scattered paint chips, and little soil. Media collected from CMP2 contained mostly soil, decaying wood, minimal refuse, and widely-scattered paint chips. Samples were collected by attaching a large stainless steel spoon to the end of a broom handle. The spoon was scraped along the bottoms of the CMPs, and the collected media was brought to the surface and placed in individual plastic bags for PID field screening. Samples were collected and placed in the appropriate containers for laboratory analysis.

3.2.2 Subsurface Soil

A total of three subsurface soil samples (including one duplicate sample) were collected from the test pit location on the north end of the AST (Figure 2) and analyzed for the parameters shown in Table 1. The test pit location was established in the Work Plan. The sample intervals were based on visual observations of the test pit interface and distance from the piping associated with the AST. Samples collected from the test pit included LPCH-AST-SS3 (1 ft bgs), LPCH-AST-SS4 (2 ft bgs), and LPCH-AST-SS5 (duplicate, 1 ft bgs). Samples were collected from the test pit interface adjacent to the AST using stainless steel scoops and placed in appropriate containers for laboratory analysis. Additional subsurface soils were placed in individual plastic bags for PID field screening.

3.2.3 Groundwater

One groundwater sample (LPCH-W2-1) and one duplicate groundwater sample (LPCH-W2-2) were collected from the water tap located within the former Lodgepole Elementary School. Water from the tap originates from Water Well #2. Prior to collection of samples the well was purged three full volumes. The well was allowed to recover to greater than 90% capacity before commencing subsequent purges. In addition to the full volume purges, the well was partially purged several times to allow field parameters to stabilize prior to collecting samples. Water Well #3 was not tested or sampled due to its inaccessibility.

Table 2. Water Well #2 Purge Data – 27 September 2007

Purge	*1*	*2*	*3*	*4*	*5*	*6*	*7*	***8***
Time	**1305**	**1315**	**1325**	**1340**	**1350**	**1400**	**1410**	1420
Volume (gallons)	35	31	31	10	10	10	10	10

Groundwater samples were collected in stainless steel bowls for checking field parameters, and then collected in individual sample containers following measurement of field parameters. Sample designations and analytical parameters are shown in Table 1. The sample handling requirements and SOPs used for sample collection and handling are found in the LPCH Phase II ESA Work Plan.

3.2.4 Asbestos Containing Material and Lead Based Paint

During Phase I activities Tetra Tech staff collected ACM and LBP samples, the samples were subsequently submitted for laboratory analysis. The laboratory analysis results were acquired from Tetra Tech by Portage Environmental, Inc., and are included in this Phase II ESA report.

Onsite investigation identified two homogenous areas of ACM. From the homogenous areas twenty-one bulk material samples were submitted for asbestos analysis. Asbestos analysis was performed by Northern Analytical Laboratories, Inc., using an Olympus polarizing microscope in accordance with EPA/600/R-93/116 July 1993. Four samples produced positive results for ACM. Each of the positive samples was comprised of chrysotile, of the serpentine asbestos category. According to the National Emission Standards for Hazardous Air Pollutants (Asbestos NESHAP Revision Final Rule in the Federal Register, Volume 55, Number 224) any friable material containing less than 10% asbestos by the Polarized Light Microscopy (PLM) method is recommended to be verified by the Point Count Method (PCM). Sample X8.1A contained an estimated quantity of 3%, however, due to time and budget constraints, was not submitted for PCM analysis. The positive PLM analysis results are summarized in Table 3.

Table 3. Summary of Positive PLM Laboratory Analysis for ACM

Sample ID	*Location*	*Description*	*Asbestos Identification*	***Estimated Quantity***

F2.1/M2.1A	**Kitchen Sink**	**Gray Tile**	**Chrysotile**	15%
F2.1/M2.1B	**Kitchen Sink**	**Gray Tile**	**Chrysotile**	15%
F2.1/M2.1C	**Kitchen Sink**	**Gray Tile**	**Chrysotile**	15%
X8.1A	Kitchen Sink Coating	Black Powder	Chrysotile	3%

Nine homogenous areas of LBP were identified during the site investigation in accordance with the standards of the U.S. Department of Housing and Urban Development and Title 40 Code of Federal Regulations Part 745.227(b). Each component with a distinct history was tested for LBP, with the exception of those that had been replaced after 1978. Tetra Tech collected 73 XRF readings during the inspection, 66 of the readings were for LBP from the building, and the remaining seven readings were used for calibration purposes. Complete XRF analysis results can be found in Appendix E – Lead Based Paint Homogenous Areas; the results of the positive XRF analysis are presented in Table 4.

Table 4. Summary of Positive XRF Analysis Results for LBP

Reading	*Component*	*Side**	*Media*	*Color*	*Substrate*	*Depth Index*	*PbC***	*PbL*	***PbK***
10	**Door**	**C**	**Paint**	**Yellow**	**Wood**	**10**	**8.8**	**6.5**	8.8
12	**Wall**	**C**	**Paint**	**White**	**Wood**	**6.19**	**5.3**	**5.3**	5.3
13	**Stage-Trim**	**C**	**Paint**	**Yellow**	**Wood**	**9.37**	**5.3**	**7.9**	5.3
53	**Baseboard**	**D**	**Paint**	**White**	**Wood**	**4.61**	**19.6**	**10.7**	19.6
54	**Baseboard**	**B**	**Paint**	**Yellow**	**Wood**	**2.39**	**7.2**	**7.2**	11.4
56	**Door**	**A**	**Paint**	**White**	**Wood**	**1.68**	**2.3**	**2.3**	3.2
65	**Door**	**B**	**Paint**	**White**	**Wood**	**10**	**26.8**	**10.7**	26.8
66	**Door**	**B**	**Paint**	**White**	**Wood**	**4.02**	**5.8**	**5.8**	5.6
67	Door	B	Paint	White	Wood	2.36	7.7	5	7.7

**Side Designations of the Lodgepole Community Hall: A=South, B=West, C=North, and D=East.*
***PbC: Combined L and K-Shell x-ray readings of lead level in mg/cm^2. PbK and PbL designate inner orbitals of the Pb atom; measurements relate to the emission of light when electrons change orbitals. Depth Index provides a unitless measure of the depth of lead below the surface.*

3.3 Data Validation and Limitations

Analytical data were validated according to procedures found in the Phase II ESA Work Plan. Two data validation reports were prepared to address data for soil and water samples. Complete data validation reports can be found in Appendix C, preceding the laboratory analytical results. The following data limitations were noted in the data validation reports:

Soils

- C9-C10 aromatics (133%) exhibited matrix spike recovery above the 130% upper control limit. However, no data qualification has been made, as no action is warranted on matrix spike recovery results alone.
- C9-C10 aromatics (80%) and Naphthalene (103%) in the duplicate was outside of the prescribed QC limits. However, no data qualification has been made, as no action is warranted on duplicate results alone.
- The naphthalene (33%) laboratory control sample (LCS) exhibited recovery below the laboratory prescribed guidelines. All naphthalene sample results have been qualified with a "UJ" validation flag due to LCS recovery less than the lower control limit but greater than 10% and sample results less than the practical quantitation limit (PQL).
- All naphthalene sample results have been qualified with a "UJ" validation flag to denote the data is non-detect and the sample quantitation limits is an estimate due to low LCS recovery and/or improper sample quantitation.
- All remaining sample results are acceptable without restriction.

Water

- C9-C10 aromatics (52%) in the duplicate were outside of the prescribed QC limits. However, no data qualification has been made, as no action is warranted on duplicate results alone.
- All results are acceptable without restriction.

4.0 EVALUATION AND PRESENTATION OF RESULTS

The information collected from the Phase II ESA was evaluated to determine the presence or absence of potential contaminants of concern, and if present, whether the levels of contamination fall within acceptable published limits for primary exposure pathways. The following sections describe the field and analytical results, and distribution of contaminants based on the laboratory analyses.

4.1 Field Measurements

This section describes field measurements taken during the LPCH Phase II ESA.

4.1.1 Soil Photoionization Detector (PID) Measurements

Field screening for VOCs in soils was performed during surface and subsurface soil sampling activities. The instrument used was a PE Photovac 2020 Photoionization Air Monitor, calibrated using 100 ppm isobutylene in air span gas. Table 5 lists field screening levels that were observed during the Phase II ESA (refer to Figure 2 Lodgepole Community Hall Sample Site Locations for general sample site locations). Due to the relatively high readings obtained from sample sites (LPCH-AST-S1, LPCH-AST-S2, and LPCH-AST-S3) an onsite decision was made to obtain additional samples (LPCH-AST-S1´, LPCH-AST-S2´, and LPCH-AST-S3´) in order to characterize the extent of contamination surrounding the AST. The additional sampling locations denoted by prime symbols (´) were located two to three feet directly outward from the

corresponding initial sample locations, in relation to the AST. A detailed schematic of sample locations can be found on Figure 2. After conducting field screens of the additional samples, it was concluded that the contamination surrounding the AST was localized to the soils immediately surrounding the AST, and most likely related to minor spills of heating oil while the tank was being filled.

Table 5. Summary of Field Screening PID Readings

Sample ID	*Time*	*Date*	*Peak Reading (ppm)**	***Average Reading (ppm)***
LPCH-AST-S3	**1450**	**26 Sept 07**	**1542**	1000
LPCH-AST-S3´	**1510**	**26 Sept 07**	**11.2**	6
LPCH-AST-S2	**1450**	**26 Sept 07**	**228**	130
LPCH-AST-S2´	**1510**	**26 Sept 07**	**15.4**	9
LPCH-AST-S1	**1455**	**26 Sept 07**	**1846**	1400
LPCH-AST-S1´	**1515**	**26 Sept 07**	**11.1**	7
LPCH-CMP1-1	**1610**	**26 Sept 07**	**4.3**	3.7
LPCH-CMP2-1	**1605**	**26 Sept 07**	**5.1**	4.0
LPCH-AST-SS3	**1105**	**27 Sept 07**	**6.5**	4.0
LPCH-AST-SS4	1110	27 Sept 07	3.6	2.5

* Peak Readings were obtained from the PID digital screen by field sampling staff during analysis.
** Average Readings are an estimate of fluctuating readings displayed by the PID monitor during analysis.

4.1.2 Groundwater Measurements

Groundwater samples were obtained from Water Well #2 via an outlet located within the former Lodgepole Elementary School. The depth to water within Water Well #2 was 15.31 feet while total depth of the well was 40.1 feet, as measured from the top of the well casing. The total calculated well volume was 36.4 gallons. A total volume of 148 gallons were pumped from the well during purging efforts. Three purges initially yielded 98 gallons, and an additional 50 gallons were purged while stabilizing field water quality parameters. Field water quality parameters were measured with an In-Situ Inc. Troll 9500 Multi-Parameter Water Quality Meter (SN# 108138). Samples LPCH-W2-1 and LCPH-W2-2 (duplicate) were collected after field parameters had stabilized. Results of field water quality parameters are summarized in Table 6.

Table 6. Summary of LPCH Water Well #2 Water Quality Parameters

		Field Water Quality Measurements					
Trial Number	*Associated Purge*	*pH*	*DO (mg/L)*	*% DO*	*Conductivity (µS/cm)*	*Temperature (ºC)*	*ORP-V (volts)*
1	**4**	**7.3**	**59.65**	**596.3**	**592.0**	**9.77**	**0.04**

2	**5**	**7.3**	**63.21**	**616.1**	**592.7**	**8.88**	**0.02**
3	**6**	**7.3**	**62.07**	**603.3**	**592.3**	**8.69**	**0.01**
4	**7**	**7.4**	**61.64**	**601.9**	**592.9**	**8.80**	**0.01**
5	**8**	**7.39**	**64.87**	**623.7**	**592.4**	**8.35**	**0.01**

4.2 Analytical Test Results

This section summarizes analytical test results for soil and groundwater samples collected during the LPCH Phase II ESA.

4.2.1 Soil Samples

The laboratory analytical data for petroleum contaminants (EPH, VPH) and metals (Pb) in LPCH surface and subsurface soil samples are shown in Tables 7, 8, and 9. Complete laboratory reports are found in Appendix D. For comparison purposes, Tables 7, 8, and 9 also include EPA and DEQ standards for surface soils.

Screening levels outlined in the *Montana DEQ Revised Technical Guidance Document #7: Soil and Groundwater Action Levels for Petroleum Releases under the DEQ Petroleum Release Section* were considered in order to determine the necessity of submitting soil samples for additional EPH fractionation and polycyclic aromatic hydrocarbon (PAH) analysis. A concentration level of 50 ppm Total Petroleum Hydrocarbon (TPH) is listed as the screening level by Guidance Document #7. Screening results greater than 50 ppm were subject to EPH fractionation and PAH analysis, plus EPA Method 8021 or 8260 for Methyl-Tert-Butyl-Ether (MTBE), Benzene-Toluene-Ethylene-Xylenes (BTEX), and Naphthalene analysis. All soil samples from the Lodgepole Community Hall Phase II ESA sampling effort were submitted for EPH fractionation, PAH, MTBE, BTEX, and Naphthalene analysis, regardless of screening levels, in order to better characterize soil contamination and for comparison with field screening (PID) results. Table 7 summarizes the results of EPH screening, and specifies the values as either exceeding or less than the DEQ screening level.

Table 7. Summary of Laboratory Screening for Extractable Petroleum Hydrocarbons in Soils

Sample ID	*Media*	*TPH (mg/kg)*	*Result*
LPCH-AST-S1	**Surface soil**	*88*	*Exceeds 50 ppm*
LPCH-AST-S2	**Surface Soil**	*58*	*Exceeds 50 ppm*
LPCH-AST-S3	**Surface soil**	*81*	*Exceeds 50 ppm*
LPCH-CMP1-3	**Surface Soil**	*65*	*Exceeds 50 ppm*
LPCH-CMP1-4	**Surface Soil**	**20**	**Less than 50 ppm**
LPCH-CMP2-3	**Surface Soil**	*1100*	*Exceeds 50 ppm*

LPCH-AST-SS3	**Subsurface Soil**	**43**	**Less than 50 ppm**
LPCH-AST-SS4	**Subsurface Soil**	*60*	*Exceeds 50 ppm*
LPCH-AST-SS5	**Subsurface Soil**	**41**	**Less than 50 ppm**

Guidance: Montana DEQ Revised Technical Guidance Document #7

Values exceeding 50 ppm subject to EPH Fractionation and PAH Analysis

The following statements can be made based on a review of Table 7:

- All soil samples exceeded DEQ EPH soil screening levels with the exceptions of LPCH-CMP1-4, LPCH-AST-SS3, and LPCH-AST-SS5;
- LPCH-CMP2-3 yielded a significantly higher TPH concentration level (1100 mg/kg) when compared to all other values.

Following EPH Fractionation, and PAH, MTBE, BTEX, and Naphthalene analysis, only LPCH-CMP2-3 produced values exceeding standards set forth by DEQ Tier 1 Residential Surface Soil RBSLs. The analytical results for CMP2-3 were compared to standards for residential soils less than 10 feet to groundwater and soils 10-20 feet to groundwater. Because the soil surface of the CMPs is below the surrounding ground surface (approximately 8 feet below grade), analytical results were also compared to Tier 1 Subsurface Soil RBSLs for subsurface soils less than 10 feet to groundwater and 10-20 feet to groundwater. In this case, again, only CMP2-3 produced values exceeding standards set forth by DEQ Tier 1 RBSLs. A summary of soil samples exceeding DEQ Tier 1 Surface and Subsurface Soil RBSLs, and relevant guidance, can be found in Table 8.

Table 8. Summary of Soil Samples Exceeding DEQ Tier 1 Risk Based Screening Levels

Sample Identification	*Benzene*	*Benzo(a)pyrene*	***Unadjusted C11-C22 Aromatics***
LPCH-CMP2-3	**< 0.1 mg/kg**	**< 0.11 mg/kg**	170 mg/kg
Guidance: DEQ Tier 1 Surface Soil Risk (0-2 ft) Based Screening Levels			
< 10 ft to Groundwater	**0.05 mg/kg**	**0.08 mg/kg**	70 mg/kg
10 – 20 ft to Groundwater	**0.05 mg/kg**	**0.08 mg/kg**	70 mg/kg
Guidance: DEQ Tier 1 Subsurface Soil Risk Based Screening Levels			
< 10 ft to Groundwater	**0.05 mg/kg**	**3 mg/kg**	100 mg/kg
10 – 20 ft to Groundwater	0.1 mg/kg	10 mg/kg	400 mg/kg

The following statements can be made based on a review of Table 8:

- Unadjusted C11-C22 Aromatics contamination from sample site LPCH-CMP2-3 exceeds the DEQ Tier 1 Surface and Subsurface Soil RBSLs for residential soils less than 10 feet from groundwater in each case. Unadjusted C11-C22 Aromatics contamination also exceeds the DEQ Tier 1 Surface Soil RBSL for soils 10-20 feet from groundwater.

- Due to the limitations of the method detection limit for Benzo(a)pyrene, it is uncertain if the value obtained from analysis does in fact exceed the surface soil RBSL of 0.08 mg/kg.

- Due to the limitations of the method detection limit for Benzene, it is uncertain if the value obtained from analysis does in fact exceed the surface and subsurface soil RBSLs of 0.05 mg/kg.

- All other analytes from LPCH-CMP2-3 (and all other soil sample sites) included within EPH Fractionation, and PAH, MTBE, Toluene, Ethylbenzene, Xylene, and Naphthalene analysis were less than the DEQ Tier 1 Surface and Surface Soil RBSLs.

Samples from within the CMPs were submitted for VPH and Metals Pb analysis in order to determine if migration from the leaky off-site UST (gasoline) to the Lodgepole Community Hall property had or had not occurred. Analytical results from samples LPCH-CMP1-3, LPCH-CMP1-4 (duplicate), and LPCH-CMP2-3 indicated that all VPH constituents were less than the DEQ Tier 1 Surface Soil RBSLs, with the possible exception of C5-C8 Aliphatics from LPCH-CMP2-3. The Tier 1 RBSL for C5-C8 Aliphatics is 10 mg/kg; LPCH-CMP2-3 contained <25 mg/kg. Due to the uncertainty of the method detection limit, it is unclear whether or not the contamination of C5-C8 Aliphatics contained within LPCH-CMP2-3 in fact exceeds the RBSL

of 10 mg/kg. Additionally, soil contaminant levels of BTEX and MTBE from within the CMPs revealed toxicity levels less than cancer and chronic combined risk levels outlined within EPA Region 9 Primary Remediation Goals.

Lead contamination from within the CMPs indicate levels exceeding background levels found on the Fort Belknap Indian Reservation. The Old Agency Landfill Phase II Environmental Site Assessment (Portage, 2005-2006) indicated a lead background level of <10 mg/kg as measured at sample site OAL-SS16; data reported by Ecology and Environment (1991) indicates a lead background level of 9.1 mg/kg. Each background sample was taken from the five acre Old Agency Landfill site, located approximately 32 miles north-northwest of the Lodgepole Community Hall. Lead levels were also compared to Residential Lead Hazard Standards – TSCA Section 403. Only contamination found within LPCH-CMP2-3 exceeded the TSCA standard of 400 ppm. A summary of metals analysis from LPCH Phase II ESA can be found in Table 9.

Table 9. Summary of Soils Metals Analysis Results from Corrugated Metal Pipes

Sample ID	*Media*	*Lead (mg/kg)*	***Result***
LPCH-CMP1-3	**Surface Soil**	**296**	Less than 400 ppm
LPCH-CMP1-4	**Surface Soil**	**337**	Less than 400 ppm
LPCH-CMP2-3	**Surface Soil**	**687**	Exceeds 400 ppm

Guidance: TSCA Section 403 Residential Lead Standard

Lead is considered a hazard when equal to or exceeding 400 ppm in bare soil in children's play areas

The following statements can be made based on a review of Table 9:

- Lead contamination found within the CMPs exceeds documented background levels from previous studies;
- Sample site LPCH-CMP2-3 produced contamination levels of Lead exceeding the TSCA Section 403 standard of 400 ppm in bare soil in children's play areas.

During sampling activities field staff observed significant quantities of paint chips within the CMPs, likely originating from building debris that had been discarded from the Lodgepole Community Hall and thrown into the CMPs. The high levels of lead measured within the CMPs can most likely be attributed to the paint chips, and not migration of gasoline. Access to the CMPs is currently restricted, and it is expected that the CMPs will be removed from the site during renovation.

4.2.2 Groundwater Samples

The laboratory analytical data for petroleum contaminants (EPH, VPH) and metals (Pb) in LPCH groundwater samples are shown in Table 10, laboratory reports can be found in Appendix D.

Groundwater samples were only taken from Lodgepole Community Hall Groundwater Well #2. For comparison purposes, Table 10 includes DEQ Tier 1 Groundwater RBSLs and Standards, Circular DEQ-7 Montana Numeric Water Quality Standards, and DEQ Revised Technical Guidance Document #7 Groundwater Action Levels for Petroleum Releases under the DEQ Petroleum Release Section.

Table 10. Summary of Groundwater Laboratory Analyses for VPH, EPH, and Metals

Analyte	***Sample Identification and Values***		***Guidance***
VPH	**LPCH-W2-1**	**LPCH-W2-2**	**Tier 1 RBSL/DEQ-7***
Total Purgeable Hydrocarbons	<200 µg/l	<200 µg/l	NA
Benzene	<1 µg/l	<1 µg/l	5 µg/l
Ethylbenzene	<1 µg/l	<1 µg/l	700 µg/l
Methyl-tert-butyl ether	<2 µg/l	<2 µg/l	30 µg/l
Naphthalene	<5 µg/l	<5 µg/l	100 µg/l
Toluene	<1 µg/l	<1 µg/l	1000 µg/l
Total Xylenes	<3 µg/l	<3 µg/l	10000 µg/l
Unadjusted C5-C8 Aliphatics	<100 µg/l	<100 µg/l	400 µg/l
Unadjusted C9-C12 Aliphatics	<100 µg/l	<100 µg/l	400 µg/l
C5-C8 Aliphatics	<100	<100	400 µg/l
C9-C12 Aliphatics	<100	<100	400 µg/l
C9-C10 Aromatics	<20 µg/l	<20 µg/l	50 µg/l
EPH	**LPCH-W2-1**	**LPCH-W2-2**	**Document #7****
Total Extractable Hydrocarbons	<200 µg/l	<200 µg/l	1000 µg/l
Metals	**LPCH-W2-1**	**LPCH-W2-2**	**DEQ-7*****
Lead as Pb (Total)	5 µg/l	5 µg/l	15 µg/l

* Guidance based upon standards set forth by Montana Numeric Water Quality Standards Circular DEQ-7 and DEQ Tier 1 Groundwater RBSLs and Standards.

** Guidance based upon action levels outlined in DEQ Revised Technical Guidance Document #7.

*** Guidance based upon standards outlined Circular DEQ-7 Montana Numeric Water Quality Standards.

The following statement can be made based on a review of Table 10:

- Groundwater analysis results for EPH, VPH, and Metals from LPCH-W2-1 and LPCH-W2-2 indicate that contamination, if present, is within acceptable limits outlined by the aforementioned guidance documents and standards, without exception.

5.0 CONCLUSIONS AND RECOMMENDATIONS

The 2007 Phase II ESA results show minimal impacts to soil and groundwater of the Lodgepole Community Hall site resulting from contaminant migration, including the possible migration pathways of contaminated soils to soils, contaminated soils to groundwater, or contaminated groundwater to wells.

Sampling of surface and subsurface soils adjacent and subjacent to the AST revealed numerous total petroleum hydrocarbon concentrations exceeding Montana DEQ soil screening levels. Samples exceeding the screening levels were submitted for EPH fractionation and PAH analysis. Constituent results from EPH fractionation and PAH analysis proved to be below levels outlined within the DEQ Tier 1 Surface and Subsurface Soil Risk Based Screening Levels. Surface and subsurface analysis of soils, in addition to field PID monitoring suggest that contamination near the AST is localized and limited in both vertical and horizontal distribution. If the opportunity exists, it would be prudent to remove the contaminated soils subjacent to the AST's northern end. Conducting field PID screening during excavation/cleanup activities would verify that

contaminated soils have been removed. Fuel contaminated soils can be disposed of at the RCRA Subtitle D Hill County Landfill (Unified Disposal District), in Havre, Montana, provided the soils meet the landfill's waste acceptance criteria.

Soil samples within CMP1 and CMP2 were analyzed for EPH Screen, EPH Fractionation and PAH analysis, VPH, and metals. Both CMP1 and CMP2 produced total petroleum hydrocarbon levels exceeding Montana DEQ soil screening levels, while LCPH-CMP2-3 revealed a relatively high result (1100 mg/kg). LPCH-CMP2-3 exceeded DEQ Tier 1 Surface Soil Risk Based Screening Levels for Benzo(a)pyrene (<0.11 mg/kg) and unadjusted C11-C22 aromatics (170 mg/kg) following EPH Fractionation and PAH analysis. LCPH-CMP2-3 also contained VPH constituent C5-C8 aliphatics (<25 mg/kg) and lead levels (687 mg/kg) in excess of acceptable standards (DEQ Tier 1 Surface Soil Risk Based Screening Levels and TSCA Section 403 - Residential Lead Hazards, respectively). Contaminated soils from CMP1 can be excavated and disposed of at the Hill County Landfill, provided it meets the landfill's waste acceptance criteria. Each CMP well should be appropriately abandoned per applicable regulations as outlined within the Administrative Rules of Montana sections 36.21.670 through 36.21.678.

Groundwater samples collected from water well #2 were tested for EPH, VPH, and metals. Analytical results show that no contamination was found within samples collected from water well #2, indicating there is no contaminant migration from soils to groundwater. Values of water quality parameters (pH, DO, % DO, Conductivity, T, ORP-V) measured during collection of field samples fell within reasonable ranges for drinking water. No recommendation for groundwater cleanup is warranted.

Nine homogenous areas of LBP were identified during the 2006 site investigation conducted by Tetra Tech. The presence of LBP within the facility prompts strict adherence to standards and best management practices set forth by the EPA, HUD, TSCA, and the CDC during demolition and rehabilitation activities. The Residential Lead-Based Hazard Reduction Act of 1992, commonly referred to as Title X, specifically applies to residential buildings and child-occupied facilities. Title X mandates the training, certification, and licensing of LBP abatement contractors, workers, and project designers, in support of 40 CFR part 745 subpart L. Construction Standards (29 CFR Part 1926.62) and the Occupational Safety and Health Standards (29 CFR Part 1910.1025) protect worker safety by setting permissible exposure limits for lead construction workers performing demolition, salvage, and renovation of lead containing materials. Waste may only be disposed in a municipal solid waste landfill as household waste under 40 CFR 261.4(b)(1) if lead concentrations within those materials are less than 5.0 mg/l, as determined by the Toxicity Characteristic Leaching Procedure (Method 1311). Best management practices promote common sense measures to minimize generation of dust, limit access to LBP debris, and to maintain the integrity of waste packaging material during storage, transportation, and disposal.

Onsite investigation identified two homogenous areas of ACM. Four samples produced positive results for ACM. Each positive sample was comprised of chrysotile, of the serpentine asbestos category. The presence of ACM within the Lodgepole Community Hall promulgates the need to remove ACM prior to commencement of renovations. Regulations and standards relevant to ACM include the Asbestos Hazard Emergency Response Act (AHERA), TSCA, and the Clean

Air Act (CAA). Removal and disposal of ACM is regulated by Asbestos National Emissions Standards for Hazardous Air Pollutants (NESHAP, Section 61.150, and 40 CFR Chapter 61 Subpart M Sections 140, 141, and 145). Asbestos abatement workers are protected by OSHA standards as outlined in 29 CFR Section 1926.1101. Asbestos related work conducted in the state of Montana must also abide by the Administrative Rules of Montana, the Montana Code Annotated, and the Montana Asbestos Work Practices and Procedures Manual.

In summary, remedial actions recommended for the Lodgepole Community Hall ESA site include:

- Removal of the AST and associated piping and appurtenances;
- Removal and disposal of petroleum contaminated soils adjacent and subjacent to the existing AST;
- Removal and abandonment of each CMP;
- Removal of contaminated soils associated with CMP2;
- Appropriate removal and disposal of LBP containing materials found at the LPCH; and
- Appropriate removal and disposal of ACM from within the interior of the LPCH.

Following completion of the suggested remedial actions, the LPCH may be restored to a condition meeting the conditions and expectations of the Fort Belknap Indian Community and the National Register of Historic Places.

6.0 REFERENCES

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