



Environment

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Controlled Groundwater Area Petition Supporting Information

Libby Groundwater Site, Libby, Montana

Revision 2

DRAFT-FINAL

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List of Acronyms

Agencies	EPA and MDEQ
ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CGA	Controlled Groundwater Area
City	City of Libby, Montana
cfs	cubic feet per second
cm/s	centimeters per second
COC	contaminant of concern
DNAPL	dense non-aqueous phase liquid
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FFS	focused feasibility study
FS	feasibility study
ft/d	feet/day
gpm	gallon per minute
GWIC	Groundwater Information Center
IC	institutional control
IP	International Paper Company
ISB	in situ biosparging
LNAPL	light non-aqueous phase liquid
MCA	Montana Code Annotated
MCL	maximum contaminant level
MDEQ	Montana Department of Environmental Quality
MDNRC	Montana Department of Natural Resources and Conservation
NAPL	non-aqueous phase liquid
NAVD	North American Vertical Datum
NPL	National Priorities List
PAHs	polynuclear aromatic hydrocarbons
PCP	pentachlorophenol
ROD	Record of Decision
µg/L	microgram per liter
RI	remedial investigation
SAETS	source area extraction and treatment system
Site	Libby Groundwater Site
TI	technical impracticability

1 Introduction

1.1 Libby Groundwater Site Summary

1.1.1 Site Operations and Regulatory Summary

The Libby Groundwater Site (Site) is a former lumber mill, plywood facility, and wood treating operation located adjacent to Highway 2, both inside and outside the city limits of Libby, Montana (Libby or City) (Figure 1). The wood treatment facility operated from 1946 to 1969, primarily using creosote and pentachlorophenol (PCP) as treatment fluids. During operations, releases of wood treating fluids and wastes resulted in impacts to soil and groundwater.

Wood treating compounds were discovered in a private well in 1979, prompting preliminary investigations by the State of Montana and the United States Environmental Protection Agency (EPA). Based on the investigation results, the Site was placed on the National Priorities List (NPL) in 1983 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), also known as Superfund.

A remedial investigation/feasibility study (RI/FS) was initiated in the mid-1980s to identify the extent of impacts and potential risk to human health and the environment. Select polynuclear aromatic hydrocarbons (PAHs), which are chemicals found in creosote, and PCP were identified as the primary contaminants of concern (COCs) for soil and groundwater. Arsenic, benzene, and dioxin/furans are also COCs in groundwater, although they occur at much lower concentrations than PCP and PAHs. Dioxin/furans are also COCs for soil. Remediation of soil and groundwater was initiated in the late 1980s and is currently ongoing. Site investigation and remediation activities are conducted under the direction of EPA and the Montana Department of Environmental Quality (MDEQ) (the Agencies).

1.1.2 Libby Groundwater Site Boundaries

EPA and MDEQ define the Site to include areas where impacted soil was excavated (former COC sources), all surface areas which are impacted with COCs in and around the excavated areas including sub-strata material, all former or future treatment areas, and the full extent of the COC plumes in groundwater. The Site boundaries are generally defined by the former mill property line (as revised through 2003) and the extent of COC plumes in groundwater, shown on Figure 1.

1.1.3 Former and Current Site Ownership

The lumber mill was originally operated by J. Neils Lumber Company from 1946 to 1957, then by St. Regis Paper Company from 1957 to 1985. Champion International purchased the mill from St. Regis in 1986, including the responsibility to continue Site investigations initiated by St. Regis and future remediation of soil and groundwater impacted by prior wood treating practices. In 1993 Champion sold the majority of the mill property (approximately 400 acres) to Stimson Lumber Company, while retaining responsibility for Site remediation and the properties associated with remediation activities. By 1994, mill operations were limited to plywood and finger-joint operations, and in 2002 plywood manufacturing ceased and finger-joint operations were curtailed. During Stimson's ownership, several parcels of the mill were sold to various individuals. In 2003, Stimson donated their portion of the mill property (shown in Figure 1) to Lincoln County Port Authority, which plans to redevelop the property. International Paper Company (IP) acquired the Site remediation responsibilities and associated properties upon its merger with Champion International Corporation on December 31, 2000.

1.1.4 Land Use on Site and Surrounding Area

The former mill area is currently used for light industrial and commercial purposes. Businesses are located along US Highway 2, but most of the former mill land is sparsely developed. Portions of the former mill owned by Lincoln County Port Authority are currently being developed for industrial, commercial, and recreational purposes. A public fishing pond was recently constructed adjacent to the Libby Creek diversion canal in the southern portion of the property for recreational purposes (Figure 1).

The Kootenai River bounds the former mill property to the north. Residential and commercial areas are located directly west and northwest of the former mill. Forest lands to the east and rural residences are located northeast of the Site on land that was originally part of the former mill property. The Libby population is approximately 5,400 and approximately 12,000 people reside in the Libby area.

1.2 Controlled Groundwater Area Overview and Sponsorship

The overall purpose of establishing a Controlled Groundwater Area (CGA) is to prevent groundwater use in areas where groundwater may be impacted by historical wood treating operations at the Site, or where pumping may induce movement of the COC plumes. The proposed CGA is 1,123 acres in size. It is generally bounded by Kootenai River on the north, the former mill property line (as revised through 2003) on the east and south, and Flower Creek on the west (Figure 1). Additional details on the CGA are provided in Section 5.0, including the technical basis for selecting the CGA boundary, proposed groundwater use restrictions within the CGA, groundwater use in and around the CGA, and other information required for the CGA petition.

The Lincoln County Board of Health is the sponsor of the proposed CGA. If this CGA is approved by the Montana Department of Natural Resources and Conservation (MDNRC), EPA and MDEQ will provide enforcement of the CGA requirements, consistent with the CERCLA requirements for the Site.

2 Site Background

2.1 Buy Water/Well Programs and City Ordinance

In 1985 during early Site investigations, 67 private off-site wells were sampled one to three times and analyzed for various inorganic and organic wood treating constituents. A total of 32 of these wells, which were located within the City limits, were found to contain detections of various constituents, predominantly PCP and PAHs. The private wells were typically used for lawn and garden irrigation and heat pumps. Although most of the well owners were also connected to the City water, some well owners were not connected and derived their water for domestic and irrigation use from their well.

A baseline human health endangerment assessment was prepared in 1986 to assess the current and future human health risks from impacted Upper Aquifer groundwater. The following exposure pathways were identified to be of potential concern: ingestion of contaminated drinking water, child ingestion of soil contaminated by groundwater irrigation, and ingestion of home garden produce irrigated with contaminated water (EPA 1986). The greatest risks for these exposure pathways were posed by PCP and PAHs in the Upper Aquifer.

The first operable unit at the Site, and the subject of the 1986 Record of Decision (ROD) (EPA 1986), was to address public exposure to impacted groundwater. EPA selected a remedy consisting of a City ordinance restricting new well installation, a Buy Water Plan to provide compensation to select City well owners in exchange for not using their wells, and use of the City's public water system as the source of alternative water. The remedy provided for continuation of the City ordinance until groundwater is cleaned to acceptable levels.

City Ordinance No. 1353, enacted in October 1986, was in the form of a City-wide well permit system that is still in place today. The permit system prohibits the installation of new wells for human consumption and irrigation, but allows well installation for use in closed systems, such as heat pumps. The City ordinance does not prohibit the use of wells existing prior to the ordinance.

Champion first began to implement the Buy Water Plan during the summer of 1985. The Buy Water Plan was offered to private well owners whose wells contained detected PCP and PAHs or were believed to be within the potential extent of PCP and PAH plumes in groundwater. The Buy Water Plan was a program where the well owner agreed to discontinue using their well, and instead use the City's water supply system that is sourced by a reservoir on Flower Creek about three miles upstream from the Site. Participating well owners also allowed Champion to cap and lock their well. Champion provided annual monetary compensation (\$200) to the well owners to pay for costs incurred by using metered public water instead of well water for irrigation in the summer months. Approximately 10 participating well owners who were not connected to City water were connected as part of the agreement. A 1986 FS for the first operable unit concluded that the City's water system could meet the new projected demand even during low flow periods in Flower Creek.

In addition to the Buy Water Plan summarized above, Champion compensated the City directly to offset lawn and garden irrigation costs for all City water users in the summer. This was to provide further incentive for well owners to use City water. IP continues to provide this compensation to the City.

By 1997, it was apparent that groundwater remediation would take longer than originally planned, possibly on the order of several decades or more. With EPA's approval, Champion offered well owners in the Buy Water Plan \$2,000 to allow Champion to permanently plug and abandon their wells according to applicable Montana regulations. The revised compensation program was referred to as the Buy Well Program. It was intended to be a more long-term measure to mitigate exposure to impacted groundwater and to compensate well owners within or near the impacted groundwater for irrigation water used during the summer months.

Libby residents were informed of potential and actual existence of wood treating constituents in groundwater and the Buy Well/Water Programs through the media, public meetings, and mass mailings. In addition, Champion contacted well owners individually.

To date, a total of 53 private wells have been included in the Buy Water/Well Programs as shown on Figure 2. Of these 53 wells, 7 well owners either declined or did not respond to requests by Champion to participate in the program.

The extent of the Upper Aquifer and Lower Aquifer plumes shown on Figure 2 is the estimated *historical* extent, based on early aquifer characterization and groundwater cleanup levels established in the 1988 ROD. The estimated *current* extent of COCs in groundwater, discussed later in Section 4.0, reflects extensively updated Site characterization data, the effects of groundwater remediation conducted from 1987 to present, and groundwater cleanup levels updated by EPA in 1997 (EPA 1997).

2.2 Remedial Investigation and Feasibility Study

A remedial investigation (RI) and feasibility study (FS) were initiated in 1983 by St. Regis and continued by Champion from 1985 to 1988. The objectives of the investigations were to define the limits and extent of wood treating constituents in soil and groundwater, and develop and evaluate alternatives for minimizing and mitigating the endangerment posed by the Site to human health and the environment.

The RI was performed in phases to evaluate the nature and extent of impacts to soil and groundwater. Investigations included continued sampling of private wells, soil sampling, installation and sampling of monitoring wells, non-aqueous phase liquid (NAPL) recovery tests, and surface water sampling.

The 1986 baseline human health endangerment assessment was expanded as part of the RI/FS to assess human health and environmental risk associated with Site soils and source material and the Lower Aquifer, in addition to the Upper Aquifer. Potential health risks for exposure to Upper Aquifer groundwater was evaluated using 35 detected constituents in private wells. The greatest risks were posed by PCP and PAHs.

The FS was performed to develop and evaluate remedial alternatives to remove or reduce potential threats to human health and the environment. As part of the FS, a pilot-scale test was conducted to evaluate in situ bioremediation for treatment of PCP and PAHs in the Upper Aquifer. Based on the pilot test results, the FS, the Proposed Plan, and public comment, EPA selected in situ bioremediation as the remedy for the Upper Aquifer in the 1988 ROD (EPA 1988), along with extraction and treatment of NAPL and dissolved phase PCP and PAHs in groundwater in the former waste pit source area.

At the time the 1988 ROD was issued, no remedial alternatives had been demonstrated to reduce PCP and PAH levels in the Lower Aquifer in a reasonable timeframe. Additional Lower Aquifer investigations included: a bench-scale study to evaluate bioremediation of dense non-aqueous phase liquid (DNAPL) in the Lower Aquifer, a field characterization study to evaluate the nature and extent of PCP and PAHs in the Lower Aquifer, a focused risk assessment to evaluate potential risk to human health and the environment from Lower Aquifer impacts, and an evaluation of technologies to remediate DNAPL in the Lower Aquifer. The results of these investigations and assessments formed the basis of EPA's decision to grant a technical impracticability (TI) waiver of applicable or relevant and appropriate requirements (ARARs) for the Lower Aquifer (EPA 1993):

2.3 Site Remedial Actions

2.3.1 Summary of EPA Decision Documents

EPA selected remedies and modifications to the remedies, with State concurrence, in the decision documents summarized below:

1986 ROD (EPA 1986)

An interim remedy of institutional controls (ICs) was established including: (1) a Buy Water Plan to provide monetary compensation to residents for using City water for human consumption and irrigation in lieu of private wells, (2) a City ordinance that prohibits drilling of new water wells for the purpose of human consumption or irrigation, and (3) an alternative water source (Section 2.1).

1988 ROD (EPA 1988)

Soil and groundwater COCs and their cleanup levels were established.

Bioremediation was selected as the primary cleanup technology including: excavation and on-site biological treatment of source area soils (above the water table), source area extraction of COC impacted groundwater and NAPL in the Upper Aquifer, biological treatment of recovered dissolved phase COCs and off-site treatment/disposal of NAPL, and in-situ bioremediation of dissolved COCs in the Upper Aquifer.

A temporary waiver of ARARs was granted for the Lower Aquifer as an interim remedy, while additional evaluations were to be performed to support the selection of a final remedy in a subsequent decision document.

1993 Explanation of Significant Differences (ESD) (EPA 1993)

A waiver of ARARs was granted for the Lower Aquifer due to the technical impracticability of removing NAPL from the Lower Aquifer and the improbability that Lower Aquifer COC impacts pose a risk to human health and the environment. A remedy of long-term monitoring and ICs was established for the Lower Aquifer.

Soil cleanup levels for three PAHs (naphthalene, pyrene, and phenanthrene) were removed. This was based on land treatment field data supporting the conclusion that protectiveness to human health and the environment would be achieved by meeting the PCP and carcinogenic PAH soil cleanup levels and the demonstration that COCs from the lined land treatment unit are unlikely to migrate to the environment.

1997 ESD (EPA 1997)

Cleanup levels for the Upper Aquifer were modified to address the updated federal maximum contaminant levels (MCLs) for PCP and dioxin/furans, and updated methods for estimating risk associated with PAHs.

Soil cleanup levels were modified to address updated methods for estimating risk associated with PAHs and dioxin/furans.

EPA initiated the Five-Year Review process for the Site in 1995. The purpose of a Five-Year Review is to determine whether a remedy remains protective of human health and the environment. Five-Year Review Reports were prepared by EPA in 1995, 2000, 2005, 2010, and 2015. EPA's 2015 Five-Year Review Report concluded that the groundwater remedy currently protects human health and the environment due to the City ordinance restricting groundwater use; however, for the remedy to be protective in the long-term it must include ICs to prohibit groundwater use in areas outside the City limits, modify ARARs and cleanup levels, and modify the groundwater remedy to achieve remedial action objectives.

A brief description of the current Site remedy components is provided in Sections 2.3.2 to 2.3.6 below.

2.3.2 Soil Excavation and Treatment

Beginning in 1989 impacted soil above the water table was excavated from the former COC source areas including the waste pit, tank farm, and butt dip (Figure 3). The excavated soil was screened to a particle size less than 1 inch, and placed in the waste pit for biological pretreatment. Rock larger than 1 inch was placed on a rock pad and the rock surfaces were treated with bioreactor effluent. Approximately 45,000 cubic yards of soil and 31,000 cubic yards of rock (> 1 inch) were excavated. Clean backfill was placed in the excavations of the former tank farm and butt dip areas.

The pretreated soil in the waste pit was transferred in stages to two land treatment units for biological treatment. In 1998, the majority of the remaining pretreated soil from the waste pit was placed on the newly constructed

expanded land treatment unit. The former waste pit excavation was backfilled with the treated rock and a silt cover. The land treatment areas are shown on Figure 3. Soil treatment is nearly completed.

2.3.3 Source Area Extraction and Treatment System

The source area extraction and treatment system (SAETS) has operated in varying configurations since 1991, and it is currently in operation. Three extraction wells were abandoned prior to 1997 due to poor NAPL recovery. The current configuration has been in operation since 2000 and includes three extraction wells (9006, 9008, and 9009), two oil/water separators, a bioreactor treatment system, an infiltration trench, and injection well 9504. The wells and infiltration trench are shown on Figure 3. The current SAETS system is shown in conceptual three-dimensional view on Figure 4.

In 2016, the three extraction wells pumped at an average (time-weighted) total rate of 25.4 gallons per minute (gpm) (AEI 2017). The total average pumping rate from 2000 through 2016 is approximately 20 gpm.

Fluids pumped from extraction well 9006 are routed to a gravitational oil/water separator, while fluids pumped from extraction wells 9008 and 9009 are combined and routed to a coalescing oil/water separator. The NAPL in the oil/water separators is shipped off-site for incineration. The water phase from well 9006 (10 gpm in 2016) is treated in bioreactors and routed to the infiltration trench located on the south side of the former waste pit. The combined water phase from wells 9008 and 9009 (15.4 gpm in 2016) is re-injected into well 9504, which is screened in the Upper Aquifer.

Since inception of the SAETS in 1991 through 2016, an estimated 40,546 gallons of NAPL have been removed from the Upper Aquifer, which is approximately 0.02 percent of the total 211.99 million gallons of fluids pumped. An average of 1,600 gallons of NAPL has been removed per year (Table 8 of AEI 2017).

2.3.4 Former In Situ Bioremediation Systems

Two in situ bioremediation systems were formerly operated in the Upper Aquifer: the intermediate injection system and the boundary injection system. These systems were designed to aerobically treat the dissolved phase COCs in the Upper Aquifer by injecting clean, oxygenated water into the aquifer. The former bioremediation injection systems are shown in plan-view on Figure 3 and in conceptual three-dimensional view on Figure 4.

The intermediate injection system, located in the former tank farm area, was operated from 1987 to 1997. The typical total average injection rate for the intermediate system was about 70 gpm of oxygenated and nutrient-enriched water.

The boundary injection system, located approximately 1,000 feet downgradient of the intermediate system, was operated from 1993 to 2003. The typical total average injection rate was about 230 gpm of oxygenated water.

Operation of these systems was discontinued because they were demonstrated to be no more effective in reducing dissolved phase PCP and PAHs to Site cleanup levels than natural attenuation, due to the presence of trapped NAPL in the Upper Aquifer. Other factors that may have contributed to inefficient performance of the prior in situ bioremediation systems is that limited oxygen can be delivered to the aquifer through oxygenated water and the injected water tends to flow through preferential pathways in the aquifer.

2.3.5 Routine Groundwater Monitoring (1985 to Present)

Groundwater quality has been monitored in select wells in the Upper and Lower Aquifers since the mid-1980s as part of both the Upper and Lower Aquifer remedies. Locations of existing monitoring wells are presented on Figure 3. Many of the wells were installed as well nests or clusters where multiple wells were installed at one location to monitor vertical variation in water quality at that location. The results of Site-wide groundwater monitoring have been reported in annual reports submitted to the Agencies since 1992.

2.3.6 Institutional Controls

ICs are part of the remedies for the Upper Aquifer, Lower Aquifer, and source area soils. ICs include administrative or legal controls that limit land or resource use. The ICs currently in place for the Site include the City ordinance restricting well drilling, described previously in Section 2.1, and deed restrictions as described below.

The 1993 deed conveying the former mill property contained IC provisions that are intended to run with the land and bind future property owners to specific obligations. First, the deed informs future owners that the property is subject to the 1989 Consent Decree and that portions of the property (former source areas) were used for the disposal of hazardous substances. Second, the 1993 deed reserved a blanket easement providing access to the former mill property to perform work related to the Consent Decree and prohibiting future property owners from interfering with measures undertaken pursuant to the Consent Decree. Third, the deed requires that due care be exercised with measures undertaken pursuant to the Consent Decree. Finally, a portion of the property is subject to specific restrictions prohibiting soil excavation or subsurface disturbance in former source areas unless approved in advance by EPA.

IP is currently working with the Agencies to consolidate and augment ICs to further reduce potential exposure to impacted groundwater. As part of this effort, a CGA is being evaluated to restrict groundwater use where Site-related groundwater impacts to either the Upper Aquifer or Lower Aquifer have occurred, including certain areas outside the City limits that are not subject to the specific prohibitions of the well drilling restriction ordinance or the proprietary ICs established in the 1993 deed conveying the former mill property. Also, areas surrounding the Site-related COC plumes are being evaluated for inclusion in the CGA to minimize COC plume movement due to pumping.

2.4 Focused Feasibility Study for the Upper Aquifer and Associated Investigations

Prior remedial efforts at the Site have not been successful in meeting groundwater cleanup levels in certain portions of the Upper Aquifer, in particular those that contain NAPL. IP is currently developing a focused feasibility study (FFS) to address NAPL-impacted portions of the Upper Aquifer. IP is performing this work in accordance with the November 2012 Statement of Work issued by EPA and agreed to by MDEQ. This study is referred to as a FFS (versus a FS) because it is focused on groundwater in the Upper Aquifer and newer remedial technologies that have been developed or further refined since the submittal of the original Libby Site 1988 FS described in Section 2.2.

IP began collecting and developing supporting information for the Upper Aquifer FFS in 2010, under the direction of the Agencies. The information collected from 2010 to 2018 is summarized as follows:

- Summarized two decades of existing Site data and identified data gaps (2009-2010);
- Installed and sampled off-site monitoring wells to refine extent of off-site plumes and replace the private wells that had been plugged and abandoned (2010);
- Further characterized NAPL and groundwater in the former waste pit, butt dip, and tank farm source areas (2011);
- Developed a numerical groundwater model to evaluate areas in Libby to restrict groundwater use to strengthen ICs (2010 to 2017);
- Conducted a vapor intrusion assessment to demonstrate vapor exposure pathway is incomplete (2011-2013);
- Re-evaluated groundwater cleanup levels based on current federal and state groundwater standards and developed updated remedial action objectives (2012);
- Conducted a hot water/steam enhanced extraction bench-scale (laboratory) study to evaluate the ability of this technology to remove NAPL (2012-2013);
- Conducted an in situ biosparging (ISB) bench-scale study to evaluate the ability of this technology to reduce dissolved COC concentrations and to enhance the dissolution of NAPL (2012-2013);
- Conducted an ISB pilot-scale (field) study to further evaluate the ISB technology to treat COCs in the former waste pit area, the area most heavily impacted by NAPL (2014-2017);
- Conducted comprehensive groundwater sampling in 2016 for COC analysis to refine remediation areas and dissolved groundwater concentrations in areas where NAPL exists (2016);
- Collected DNAPL and light non-aqueous phase liquid (LNAPL) samples for chemical analysis to estimate molecular weight and effective solubility to support estimating remediation timeframes (2016-2017);

- Evaluated LNAPL transmissivity in existing wells near former tank farm to evaluate LNAPL recoverability and appropriate recovery methods (2016-2017);
- Drilled 3 well nests in area where former mill buildings were located to further delineate and characterize remediation areas (2016); and
- Evaluated natural source zone depletion to identify and quantify NAPL mass depletion processes and support remediation timeframe estimates (2016-2018).

IP is in the process of developing the Upper Aquifer FFS report. The report presents the updated remedial action objectives, screening of remedial technologies, remedial alternatives developed from selected technologies, and screening of alternatives against EPA's FS criteria. Each alternative, except no further action, includes active remediation in areas where NAPL is present. ICs, including the City ordinance and the proposed CGA, were included as part of each alternative to eliminate exposure pathways and minimize COC plume movement during the remediation.

3 Site Hydrogeology

3.1 Hydrogeologic Setting

The Libby Site lies within a valley bordered by mountains (Figure 1). The valley has received deposits of both alluvial and glacial sediments, as well as erosional remnants from the surrounding mountains. The multiple sources of geologic materials have resulted in a complex stratigraphic system beneath the Site. Mountain valleys contain small streams, including Libby Creek and Flower Creek, which are recharged by high-country snowpack. These creeks flow into the regional Kootenai River.

The Site directly overlies the Libby valley deposits that consist of a complex stratigraphic sequence of discontinuous deposits of cobbles/boulders, gravel, sand, silt, and clay of alluvial and glacial origin. These heterogeneous deposits extend from the surface to approximately 140 to 190 feet below ground surface (bgs) at the Site. It is these deposits that form the Upper Aquifer, the Intermediate Zone, and the Lower Aquifer (Figure 4).

Underlying the Lower Aquifer, are glacial deposits predominately composed of clay and silt with varying content of gravel and sand, and occasional cobbles/boulders, that resembles a glacial till. Few borings have been drilled into the glacial till. The glacial till is expected to extend more than 500 feet deep to the Precambrian bedrock. The Precambrian rock beneath the Libby valley was probably eroded by the advance of an ice sheet that moved up Libby Creek. Subsequently glacial till was deposited within this bedrock valley-shaped erosional feature.

Glacial lacustrine (lakebed) deposits form the cliffs along the east side of the Libby valley. These deposits are visible from the former lumber mill. The lacustrine deposits extend downward several hundred feet and are directly underlain by the glacial till. The Libby valley alluvial deposits that form the aquifers are absent under the bluffs, according to a conceptual cross section of the valley in Boettcher and Wilke (1978).

3.2 Characteristics of Hydrogeologic Units

3.2.1 Upper Aquifer

The Upper Aquifer is unconfined. The top of the Upper Aquifer is defined by the water table surface at a depth of approximately 6 feet bgs (near the fire pond) to 24 feet bgs (in the City), based on 2016 water table elevation data. The bottom of the Upper Aquifer is at a depth ranging from approximately 55 to 78 feet bgs across the Site. The Upper Aquifer consists of clean to silty/clayey gravel and sand with cobbles and boulders and occasional interbedded layers of clayey, silty, deposits approximately 2 to 10 feet thick.

The average hydraulic conductivity of the Upper Aquifer is estimated to range from 4.5 feet/day (ft/d) [1.6×10^{-3} centimeters/second (cm/s)] in the former waste pit area to 800 ft/d (2.8×10^{-1} cm/s) near the former boundary injection system. The Upper Aquifer hydraulic conductivity increases downgradient to the north, toward the Kootenai River. The increase of hydraulic conductivity to the north corresponds with an observed increase in

clean sand and gravel layers, several feet thick that are capable of producing 50 gpm of water during air rotary drilling.

Overall, the Upper Aquifer has a higher hydraulic conductivity than the underlying Intermediate Zone and Lower Aquifer. The private wells in Libby identified to date are believed to be completed in the Upper Aquifer. The maximum well yield in the former waste pit area, where the hydraulic conductivity is lower, is approximately 15 gpm. Very large well yields can be achieved farther downgradient. A temporary construction dewatering well near the hospital was reported to pump 500 gpm with only 9 feet of drawdown in the pumping well. The majority of private wells in Libby were permitted by the State to pump a maximum of 15 gpm, with an overall annual average rate of approximately 0.5 gpm.

3.2.2 Intermediate Zone

The Intermediate Zone is a leaky aquitard that extends from approximately 70 feet bgs to 105 feet bgs. The deposits in this 35-foot-thick zone are similar to those in the Upper Aquifer, but contain a much higher content of silt and clay. The transition from the Upper Aquifer to the Intermediate Zone can be subtle. Both units consist of interbedded water bearing and non-water bearing strata; however, the Upper Aquifer contains more water bearing strata than the Intermediate Zone.

Hydraulic testing has not been performed in the Intermediate Zone; therefore, the hydraulic conductivity has been estimated based on visual classification of the material and water production during drilling, and professional judgment. The Intermediate Zone hydraulic conductivity is expected to be low (on the order of 1 ft/d or 4×10^{-4} cm/s), based on lack of water production during drilling through this unit and the high content of fines (silt and clay) observed.

3.2.3 Lower Aquifer

The Lower Aquifer underlies the Intermediate Zone and extends from approximately 105 to 160 feet bgs. It is a semi-confined aquifer. The transition from the Intermediate Zone to the Lower Aquifer is more subtle than the transition between the Upper Aquifer and the Intermediate Zone. The Lower Aquifer consists of clean to silty gravel and sand with cobbles and boulders interbedded with sandy, gravelly silt and clay layers, similar to the Upper Aquifer; however, the Lower Aquifer appears to have both higher silt and clay content and more silt and clay interbeds than the Upper Aquifer. The glacial till that underlies the Lower Aquifer serves as a barrier to downward groundwater movement from the alluvial deposits in the Libby valley.

Hydraulic testing has not been extensively performed in the Lower Aquifer. The hydraulic conductivity is estimated to range from 10 to 100 ft/d (4×10^{-3} to 4×10^{-2} cm/s) based on a low-yield pumping test, water production rates during drilling, electromagnetic conductivity logging, and borehole sample descriptions.

3.3 Groundwater Flow

The direction of groundwater flow is predominantly to the north toward the Kootenai River, following the slope of the ground surface topography. A groundwater table contour map of the Upper Aquifer is shown on Figure 5 for groundwater levels measured in August 2016. A strong localized hydraulic gradient exists around the fire pond as a result of surface water leakage into the Upper Aquifer.

Groundwater in the Lower Aquifer flows to the north toward the Kootenai River. A potentiometric contour map is shown on Figure 6 for groundwater levels measured in the Lower Aquifer in August 2016.

The vertical hydraulic gradient is downward from the Upper Aquifer to the Lower Aquifer in the former waste pit source area. Farther downgradient, about mid-way between the former waste pit and the Kootenai River, there is a slight upward hydraulic gradient from the Lower Aquifer to the Upper Aquifer. As groundwater continues to flow toward the river, the upward hydraulic gradient diminishes and converts to mostly horizontal flow in both aquifers.

The overall horizontal and vertical direction of groundwater flow in the Upper and Lower Aquifers in the Libby valley has remained consistent from year to year. Groundwater potentiometric surface maps are available for the years 1992 through 2017 in the annual groundwater monitoring reports.

3.4 Stream-Aquifer Interaction

The main surface water bodies that influence the Site hydrologic regime are the fire pond, Libby Creek, Flower Creek, and the Kootenai River (Figure 1).

The fire pond receives water from Libby Creek through an unlined diversion canal and stores water for fire protection. Both the canal and the pond lose water to the underlying aquifer.

Libby Creek is a perennial stream. Boetter and Wilke (1978) reported a measured stream flow of 85 cubic feet per second (cfs) (39,000 gpm) south of the fire pond during the low flow season of 1974, and that the creek was gaining or losing along different segments of the creek of approximately 11 miles. Immediately upstream of the fire pond, the creek is likely a losing stream but may become a gaining stream near its junction with the Kootenai River.

Flower Creek has a much smaller drainage basin than Libby Creek and can dry up in its lower reaches during the summer and fall months. Flower Creek is largely a losing stream but may become a gaining stream near its junction with the Kootenai River during high water table months (spring to summer).

The Kootenai River is the regional drainage and it is normally a gaining stream. The average monthly flow rate in the river varies from 5,000 cfs to 33,000 cfs over 80 years (1911 to 1991) (USGS 12303000 Kootenai River at Libby MT). Since 1975, the river has been regulated at the Libby Dam located 17 miles upstream from Libby. Sometimes large releases from the upstream reservoir may result in temporary discharges to groundwater. The average river stage elevation at the gauging station, approximately 1,700 feet downstream of the Highway 37 bridge in Libby, was approximately elevation 2049 feet mean sea level during August (from 1911 to 1991), based on the North American Vertical Datum 1988 (NAVD88).

3.5 Groundwater Recharge and Discharge

Precipitation in the mountains surrounding the Libby valley enters mountain streams via surface and subsurface flow. The annual precipitation ranged from 12.04 to 25.56 inches from 1940 to 1970, with an average annual precipitation of 19.4 inches (Boettcher and Wilke 1978). The mountain streams then discharge to valley streams (e.g., Libby Creek, Flower Creek, and Parmenter Creek). Groundwater recharge to the Libby valley aquifers results from infiltration of precipitation, losing valley streams and other surface water bodies (e.g., fire pond), and lawn irrigation water in Libby.

The City ordinance prohibiting the installation of new wells for domestic and irrigation purposes has been in place since the mid-1980s to limit human exposure to Site-related COCs. Therefore, there is limited groundwater withdrawal in the vicinity of the Site.

Limited groundwater withdrawal in the vicinity of the Site includes:

- Dewatering well 3092, located in the former mill area (Figure 3), has been operated intermittently for several decades to prevent groundwater from flowing into a manhole access to the sewer system. Although the well is thought to be capable of producing up to 150 gpm, the estimated average pumping rate in 2016 was 19 gpm.
- Groundwater extraction occurs during operation of the SAETS (Section 2.3.3). The processed groundwater is re-injected back into the Upper Aquifer via an injection well and an infiltration gallery (Figure 3).
- Temporary groundwater withdrawals for construction dewatering.
- Limited pumping may occur from private wells in Libby. These wells are typically permitted at a continuous average rate of 0.5 gpm.

4 Current Extent of COCs in Groundwater

4.1 Former and Current Sources of COCs in Groundwater

In the original Site FS, three areas were identified as the primary sources of COCs and NAPL to groundwater: the former waste pit, the former tank farm, and the former butt dip area (Figure 1). As part of remedial actions that began in 1989, soil above the water table in these areas was excavated and biologically treated in land treatment units on Site (Section 2.3.2). These three areas are now referred to as “former source areas.”

Currently, the primary source of COCs in groundwater is wood treating fluid and wastes that remain in the aquifer in the form of NAPL. Both LNAPL which is less dense than water, and DNAPL which is denser than water, exist in groundwater. COCs adsorbed to the aquifer matrix or stored as dissolved COCs in finer-grained layers (diffuse mass) are also potential sources of COCs in groundwater. NAPL historically migrated both vertically downward and laterally downgradient away from the former source areas in a complex flow path dependent on the NAPL release volume, the physical properties of the various wood treating mixtures and wastes that seeped into the aquifer during different periods, and historical groundwater flow in the aquifer.

The extent of NAPL in the aquifers has been investigated and documented through drilling and well monitoring activities from 1984 to present. NAPL is easily observed during drilling due to the high visibility of creosote and its distinct odor, and NAPL observations were typically documented in Site boring logs. The Upper Aquifer, the Intermediate Zone, and the Lower Aquifer are impacted by NAPL based on observations in boring and wells drilled into these units. The glacial till underlying the Lower Aquifer is expected to limit further vertical migration of NAPL in the subsurface.

Site NAPL properties that have been tested and evaluated include chemical composition, physical properties, pore fluid saturation, and aquifer transmissivity to LNAPL.

4.2 COCs in the Upper Aquifer

Groundwater COCs were established in the 1988 ROD and the 1997 ESD. Groundwater cleanup levels for the Upper Aquifer were updated in the Draft-Final Upper Aquifer FFS report to reflect updated ARARs related to groundwater. These cleanup levels are referred to as “preliminary revised groundwater cleanup levels” (Table 1). The extent of COC concentrations above cleanup levels are evaluated on an annual basis. The results are provided to EPA and MDEQ in annual reports.

PCP typically has represented the outermost extent of COCs above cleanup levels in the Upper Aquifer since groundwater cleanup levels were revised in the 1997 ESD. Since 1997, the PCP cleanup level has been based on the MCL of 1 microgram per liter ($\mu\text{g/L}$) (Table 1). The extent of the other COCs above their cleanup levels in the Upper Aquifer are within the PCP extent. Concentrations of PCP in the Upper Aquifer above $1 \mu\text{g/L}$ is shown on Figure 7 for the shallow subunit of the Upper Aquifer (water table to 36 feet bgs) and on Figure 8 for the middle/deep subunit of the Upper Aquifer (36 feet to an average of 70 feet bgs), based on comprehensive sampling data collected in 2016. A comparison of the PCP distribution in the shallow and middle/deep subunits shows that the extent of PCP is larger in the middle/deep subunit and the concentrations are generally higher throughout the subunit. This is also the case for the PAH COCs.

The extent of NAPL observed in the Upper Aquifer during drilling also is shown on Figures 7 and 8. Wells sampled where NAPL has been observed may not represent the dissolved phase concentration. A small amount of NAPL observed in the groundwater sample (droplets or sheen) can increase the PCP concentration in the sample by up to an estimated 5,000 $\mu\text{g/L}$ PCP. The estimated effective solubility of PCP in the Site-specific NAPL is 1,000 $\mu\text{g/L}$ (Appendix A, Section 4), thus PCP concentrations above 1,000 $\mu\text{g/L}$ may not be representative of the dissolved phase PCP concentration. An asterisk next to the concentration indicates NAPL has been observed recently (since 2014) in the sampled well.

PCP and other COC concentrations in the Upper Aquifer have been relatively stable since monitoring began in the mid 1980's, due to natural attenuation caused by adsorption, dispersion, and biodegradation. In a few areas concentrations have decreased, indicating plume recession is slowly occurring. Prior operation of the in situ bioremediation systems may have enhanced plume stability/recession in localized areas where little to no NAPL is present.

Currently, residual NAPL downgradient of the former waste pit is likely contributing to the dissolved-phase PCP plume downgradient of the former waste pit.

4.3 COCs in the Lower Aquifer

There is currently a TI waiver of ARARs for the Lower Aquifer (Section 2.3.1). COC concentrations are reviewed on an annual basis to monitor the Lower Aquifer plume stability as required in the 1993 ESD. Similar to the Upper Aquifer, PCP typically has represented the outermost extent of COCs in groundwater in the Lower Aquifer since groundwater cleanup levels were revised in the 1997 ESD. The extent of the other COCs in the Lower Aquifer are within the extent of the PCP plume. Concentrations of PCP in the Lower Aquifer are shown on Figure 9, based on annual sampling data from 2016.

The extent of NAPL observed in the Lower Aquifer during drilling is shown on Figure 9. NAPL in the Lower Aquifer extends farther downgradient than in the Upper Aquifer, and the lateral extent is larger. Because the objective of the Lower Aquifer monitoring program is to evaluate plume stability, monitoring is focused on the downgradient portion of the plume where little to no NAPL is in the monitoring wells. None of the Lower Aquifer wells included in the annual monitoring program have recently contained NAPL, except for well 6002.3. Currently, NAPL in the Lower Aquifer is likely contributing to the PCP plume.

PCP and other COC concentrations in the Lower Aquifer have been relatively stable since monitoring began in the mid 1980's, due to natural attenuation caused by adsorption, dispersion and biodegradation. In 2016 and 2017, PCP slightly above the MCL of 1 µg/L was observed in one of the downgradient sentinel wells that historically had no detections of PCP above the typical reporting limit of 0.5 µg/L. IP will be drilling an additional well in the Lower Aquifer in the summer of 2018 to further assess if limited plume migration is occurring in the Lower Aquifer.

5 CGA Details

5.1 Criteria for Establishing a CGA

The Montana Code Annotated (MCA) 85-2-506 provides for two types of CGA designations, either temporary or permanent. A temporary CGA is for the purpose of study and may include measurement, water quality testing, and reporting requirements, but cannot include control provisions, such as restricting groundwater use. Also, a temporary CGA is limited to a period no longer than six years. A permanent CGA may be designated if one or more of the criteria in MCA 85-2-506(5) are met. The boundaries or conditions of a permanent CGA may be modified or cancelled over time as deemed appropriate by the oversight Agencies and with the support of the CGA sponsor and approval of the MDNRC.

A permanent CGA designation is proposed for the 1,123 acre area shown in Figure 1, based on meeting three of the five criteria in MCA 85-2-506 (5) for designating a permanent CGA, as follows:

MCA 85-2-506 (5)(e): Groundwater within the proposed CGA is not suited for beneficial use

COC impacted groundwater within the Upper and Lower Aquifer plumes (Figure 1) is regulated under a judicial Consent Decree between Champion and EPA. Groundwater within the COC plumes exceed cleanup levels deemed suitable for human consumption, domestic use, or irrigation. The extent of COCs in groundwater in the Upper and Lower Aquifers is defined based on extensive subsurface investigations performed since the mid-1980s and routine sampling of the groundwater monitoring network installed to date. Groundwater COC concentrations above Site cleanup levels (Table 1) have not been detected outside the plume extent shown on Figure 1 for the past five years or more. However; the distribution of NAPL and dissolved COCs in the Upper and Lower Aquifers is highly complex, causing some uncertainty in the mapped extent. NAPL and dissolved COCs historically migrated away from the former waste pit and tank farm source areas through discrete layers, resulting in high variability in NAPL occurrence and COC concentrations vertically within the aquifers, as presented previously in Section 4. Although there are multiple monitoring points vertically at each monitoring location, COCs above cleanup levels may occur outside the mapped extent, and clean zones of groundwater occur inside the

mapped extent. To address uncertainty in the plume extent, the proposed CGA buffer zone incorporates the historical extent of detected COCs in the aquifers shown on Figure 2.

The existing land treatment area and expanded land treatment area (Figure 1) has been used since 1989 to treat soil impacted with COCs from historical wood treating operations. The most upgradient portion of the aquifer plumes is underneath a portion of the land treatment area. Completion of soil treatment is anticipated within the next two years. The treated soil from the expanded land treatment area will be transferred to an existing lined 2-acre soil treatment unit equipped with a leachate collection system. The leachate quality is routinely monitored and accumulated leachate is removed. At closure, the treated soil will be covered with low permeability material to minimize infiltration of precipitation and production of leachate. The land treatment areas will be included in the proposed CGA in the event of potential future leachate seepage to groundwater during final soil treatment operations or closure.

MCA 85-2-506 (5)(c): Projected groundwater withdrawals from the aquifer(s) in the proposed CGA will induce or alter contaminant migration exceeding relevant water quality standards

The aquifers in the lower Libby valley (lower two-thirds of the proposed CGA) have a high transmissivity, especially the Upper Aquifer, and are capable of producing large volumes of groundwater to wells. Moderate to high volume groundwater withdrawals, such as from production wells or multiple low volume wells, have the potential to alter the plume dynamics and draw contaminated groundwater into unimpacted areas or pumping wells. This potential is greatest north of the plumes toward Kootenai River, east of the plumes toward Libby Creek, and west of the plumes toward Flower Creek.

Pumping hydraulically downgradient of the plumes has the potential to increase the groundwater velocity and move the plumes northward toward the Kootenai River or into pumping wells potentially located in this area. The north proposed CGA boundary, formed by the Kootenai River, was selected to prevent additional groundwater withdrawals directly downgradient of the groundwater plumes.

Pumping on the east and west sides of plumes, cross-gradient to natural groundwater flow, has the potential to alter the plumes' configuration and draw contaminated groundwater into the wells. The degree of alteration is dependent on many variables including the number of pumping wells operating, the well locations relative to the plume, well spacing, pumping rates, and the hydraulic properties at the well location and vicinity. Numerical groundwater flow modeling was used to evaluate the effect of various pumping scenarios on flow paths within the Upper and Lower Aquifer plumes. Appendix A presents the numerical modeling results used to evaluate the effects of pumping outside the proposed CGA lateral to the plumes and to assess the suitability of the proposed boundary in minimizing future plume movement or alteration from pumping. Appendix A also presents analytical modeling to evaluate PCP attenuation along the altered groundwater flow paths.

Based on the model results (Appendix A), pumping laterally outside the proposed CGA in the Upper and Lower Aquifers at maximum potential pumping rates is predicted to alter groundwater flow paths and plume configuration, but the alteration would be relatively minor. Such minor alterations in the plume can be reviewed and managed as part of the annual groundwater monitoring evaluations at the Site. Simulated pumping outside the CGA at two locations in the Lower Aquifer caused groundwater flow from the plume area to be redirected from its current flow path to the pumping well. However, COCs are not estimated to reach the CGA boundary, due to the distance from the plume to the CGA boundary and natural attenuation of the COCs along the flow path in the aquifer.

In earlier phases of numerical modeling, pumping wells were simulated inside the proposed CGA boundary to evaluate if a smaller CGA on the east and west would be sufficiently protective. Pumping at maximum potential rates at well locations 500 feet west of Libby Creek and 500 feet east of Flower Creek inside the proposed CGA resulted in greater flow path movement within the plumes compared to pumping outside the CGA, as would be expected. Also, groundwater flow from the plume area was redirected from its current path to two Upper Aquifer and four Lower Aquifer pumping wells in the simulations. Given the greater potential for pumping to alter the plume configuration and draw contaminated water toward a pumping well, the smaller CGA was not considered further.

The south proposed CGA boundary and the southern portion of the east boundary overlies water bearing units that are much less permeable than the alluvial deposits in the lower Libby valley. Pumping outside the CGA in these areas is unlikely to affect groundwater flow paths or plume configuration inside the CGA. The bluffs that

form the western portion of the south CGA boundary and the southern portion of the east CGA boundary are low permeable lakebed deposits that extend vertically downward several hundred feet to the contact with the glacial till (Section 3.1.). The eastern portion of the south CGA boundary overlies Libby valley alluvial deposits, but they contain more fine-grained soils compared to Upper and Lower Aquifer soil farther downgradient to the north.

In earlier phases of numerical modeling, pumping was simulated in the Libby valley alluvial deposits just outside the south CGA boundary to verify that pumping would not affect groundwater flow paths inside the CGA. Pumping was simulated in one to six wells at a total pumping rate of 6 gpm. No effect on simulated groundwater flow paths was observed inside the CGA, thus the south boundary was considered appropriate.

MCA 85-2-506 (5)(f): Public health, safety, or welfare will become at risk

The City ordinance that prohibits the installation of new wells for human consumption and irrigation is an IC that is part of the CERCLA remedy for the Upper and Lower Aquifers, as discussed previously in Section 2.3.6. In the 2015 Five Year Review (EPA 2015), EPA concluded that for the remedy to be protective in the long-term it must include ICs to prevent groundwater use in areas outside the City limits. The proposed CGA would serve as an additional IC to fulfill this requirement while aquifer restoration is occurring naturally and by active treatment.

As required by MCA 85-2-506 (3)(i), the analysis to support the conclusions above were prepared and reviewed by qualified hydrogeologists and engineers. The qualifications of these staff are provided in Appendix B. In addition, the analysis was reviewed by appropriately qualified individuals from the oversight Agencies.

5.2 CGA Boundary Description

The proposed CGA is 1,123 acres in size, located in Township 30N, Range 31W, portions of Sections 2, 3, 4, 9, 10, 11, and in Township 31N, Range 31W, a portion of Sections 34, as shown on Figure 10. The CGA boundaries were selected to be of sufficient size and depth to be protective of human health and the environment, while minimizing groundwater use restrictions to property owners.

The proposed CGA encompasses the existing groundwater plumes (Figure 1), the historical groundwater plumes (Figure 2), and ongoing Site soil treatment operations (Figure 1). The proposed CGA includes a buffer area surrounding the plumes that is sufficiently large to include where pumping may induce movement of the contaminant plumes in groundwater and uncertainty in the plumes' extent and in the predicted effects of pumping on the existing and future plume configuration.

The proposed horizontal CGA boundaries coincide with features that are relatively easy to identify at the ground surface. These features include legal property lines, regional and local surface water drainages, and geologic features that form barriers to groundwater flow, such as the low permeability lakebed deposits that form bluffs on the east and west sides of the valley. The proposed CGA boundaries are described below:

North CGA Boundary

The proposed north CGA boundary is the Kootenai River, a regional river. This boundary was selected to prevent future pumping directly downgradient of the groundwater plumes. Pumping wells located hydraulically downgradient of the plumes have the potential to increase the groundwater velocity and move the plumes northward toward the Kootenai River or into pumping wells.

South CGA Boundary

The proposed south CGA boundary is formed by the former mill property line, Highway 2, and low permeable lakebed deposits. From east to west the boundary follows the former mill property line on the south and then turns north along the east side of Highway 2 for 0.6 miles. The boundary turns westward toward Flower Creek along the valley wall of low permeability lakebed deposits. The south boundary encompasses IP's land treatment areas where COC impacted soils from the Site are currently biologically treated in above ground cells.

East CGA Boundary

The proposed east CGA boundary is the former lumber mill property line (as revised through 2003), located on the east side of Libby Creek, a tributary to Kootenai River. The majority of this boundary follows a bluff of low permeable lakebed deposits that bound the alluvial aquifers on the east.

West CGA Boundary

The proposed west CGA boundary is Flower Creek, a tributary to Kootenai River.

Vertical CGA Boundary

The proposed vertical CGA boundary extends through all water-bearing zones. Although groundwater impacts are mostly limited to the Libby valley alluvial deposits, that extend from the water table to the glacial till at approximately 160 feet bgs, there is risk of penetrating NAPL impacted strata while drilling through the Upper and Lower Aquifers and cross contaminating non-impacted aquifer layers and the underlying glacial till. There is little incentive to drill beneath the Lower Aquifer, because the underlying glacial till extends over 500 feet bgs and is not considered a good water bearing unit.

5.3 Current Property Ownership and Groundwater Use

Approximately 1,400 property parcels were identified in the proposed CGA. They include residential, commercial, and industrial properties. The property owners and their mailing addresses are provided in Appendix C.

Potential groundwater users in and around the proposed CGA were identified using State databases and prior Site well inventory information. Figure 10 displays available private well data within the CGA and surrounding area. Well locations were obtained from well log reports in the Groundwater Information Center (GWIC) database. Groundwater rights locations were obtained from MDNRC's water rights database. The location of the 1000 series private wells that were inventoried and sampled in 1985 as part of Site investigations and development of the Buy Water Plan (Section 2.1) were obtained from IP's Site database. Some well data locations were modified from the database locations to reduce redundancy or correct the location if the duplicate or correct location could be reasonably confirmed by parcel or other information.

Groundwater use in Libby was substantially reduced as a result of the Buy Water/Well Programs and the 1986 City ordinance prohibiting new wells for domestic and irrigation use. The majority of private wells that contained Site COCs or were near areas of COC detections in groundwater were plugged and abandoned (Section 2.1). Therefore, many of the wells associated with well log reports and water rights in the State database, shown on Figure 10, are no longer used. There may be some private wells that are still in use in the proposed CGA, such as wells installed prior to the 1986 City ordinance or wells installed outside City limits.

Figure 11 shows properties inside the CGA that are outside the City limits and not subject to the City ordinance that restricts groundwater use. These properties are shown with shading to represent property owned by IP, Lincoln County Port Authority, and others. IP is currently working with City officials to identify those areas inside the proposed CGA which are not currently serviced by City water. Also Figure 11 shows the approximate boundary of the former mill property that was transferred to new owners with deed restrictions related to the Site.

5.4 Proposed CGA Restrictions

The proposed restrictions within the CGA are as follows:

- Permits would be required from MDNRC for any drilling below the water table, as approved by EPA and MDEQ.
- Permits will not be granted for the drilling and installation of new wells for the purpose of human consumption; irrigation, domestic use, and commercial/industrial use.
- Permits would be required from MDNRC for other drilling purposes, such as closed loop heat pump wells, geotechnical borings, temporary construction dewatering wells, etc., as approved by EPA and MDEQ.
- Monitoring and remediation wells approved by EPA and MDEQ would be allowed within the CGA.

The purposes of these restrictions are to prevent exposure of Libby residents and workers to COCs, to prevent movement of COC plumes to areas that are currently not impacted, and to prevent unintentional COC releases to the environment caused by potential mishandling of contaminated media potentially generated during drilling and pumping groundwater.

5.5 Satisfaction of Applicable Petitioning Criteria and Monitoring

The Libby Site aquifers have proven resistant to timely restoration of groundwater to potential beneficial use. This is due to the complex lithology and the nature and extent of wood treating fluids that historically seeped through the aquifers over the decades.

Remediation of the Upper Aquifer is ongoing, and a modified remediation approach is currently being evaluated to improve the progress of Upper Aquifer remediation, as discussed in Section 2.4. Even with active remediation of the most impacted area of the Upper Aquifer, COCs in groundwater above Site cleanup levels may persist in the Upper Aquifer for several decades, and potentially longer in the Lower Aquifer.

Site groundwater monitoring data are collected annually, interpreted, and reviewed by EPA and MDEQ. If changes in groundwater conditions occur, they are readily identified and addressed, if needed. EPA is required under CERCLA to perform a comprehensive review of the current remedy every five years to evaluate the implementation and performance of the remedy in order to determine if it is protective of human health and the environment. The Five Year Review report documents methods, findings, and conclusions drawn. In addition, the report identifies any issues found during the review and proposes recommendations to address them. The proposed CGA, as part of the Site remedy, will be reviewed at least every five years under this process.

It is recommended that EPA, MDEQ, and the Lincoln County Board of Health as the CGA sponsor, convene at least every five years to discuss the performance of the CGA, implementation challenges/successes, or other issues as identified.

If the CGA is approved, other actions will be taken by IP to enhance the success of the CGA. City water supplies are sufficient to serve properties inside the CGA that are not currently connected to City water, both inside and outside of City limits. Also, IP will offer to plug and abandon existing wells inside the CGA, similar to the Buy Well Program described in Section 2.1 to provide incentive to current potential groundwater users to discontinue use of their well.

6 References

- Arrowhead Engineering, Inc. (AEI). 2017. 2016 Annual Groundwater Monitoring Report for the Upper and Lower Aquifers, Libby Groundwater Site, Libby, Montana. Prepared for International Paper Company. March 28.
- Boettcher, Arnold J., and Kathleen R. Wilke. 1978. *Ground-Water Resources in the Libby Area, Northwestern Montana*. Bulletin 106. State of Montana, Bureau of Mines and Geology. June.
- United States Environmental Protection Agency (EPA). 1986. *Record of Decision, Libby Groundwater Superfund Site*. Lincoln County, Montana. September 26.
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- EPA. 1993. Explanation of Significant Differences, Libby Groundwater Superfund Site. Lincoln County, Montana. September.
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- EPA. 2015. Fifth Five-Year Review Report, Libby Groundwater Contamination Superfund Site. Lincoln County, Montana. August.

Table

Table 1. Preliminary Revised Groundwater Cleanup Levels for the Upper Aquifer

Contaminants of Concern ^a	Preliminary Revised Groundwater Cleanup Level for the Upper Aquifer ^b	Units	Basis ^c
PAHs			
Acenaphthene	70	µg/L	DEQ-7
Anthracene	2100	µg/L	DEQ-7
Fluoranthene	20	µg/L	DEQ-7
Fluorene	50	µg/L	DEQ-7
Naphthalene	100	µg/L	DEQ-7
Pyrene	20	µg/L	DEQ-7
Benzo (a) anthracene	0.5	µg/L	DEQ-7
Benzo (a) pyrene	0.2	µg/L	MCL
Benzo (b) fluoranthene	0.5	µg/L	DEQ-7
Benzo (k) fluoranthene	5	µg/L	DEQ-7
Chrysene	50	µg/L	DEQ-7
Dibenzo (a,h) anthracene	0.05	µg/L	DEQ-7
Indeno (1,2,3-c,d) pyrene	0.5	µg/L	DEQ-7
Other Compounds			
Pentachlorophenol	1	µg/L	MCL
Benzene	5	µg/L	MCL
Arsenic	10	µg/L	MCL
2,3,7,8-TCDD	30	pg/L	MCL

Notes:

^a Groundwater COCs were established in the 1988 ROD and 1997 ESD.

^b The preliminary revised groundwater cleanup levels are from the Draft-Final Report: Focused Feasibility Study for the Upper Aquifer, March 9, 2018.

^c MCLs are selected as the preliminary revised groundwater cleanup level where a MCL exists. MDEQ *Circular DEQ-7 Numeric Groundwater Standards*, April 2017, were selected for COCs that do not have a promulgated MCL.

COC – contaminant of concern

MCL – maximum contaminant level

MDEQ – Montana Department of Environmental Quality

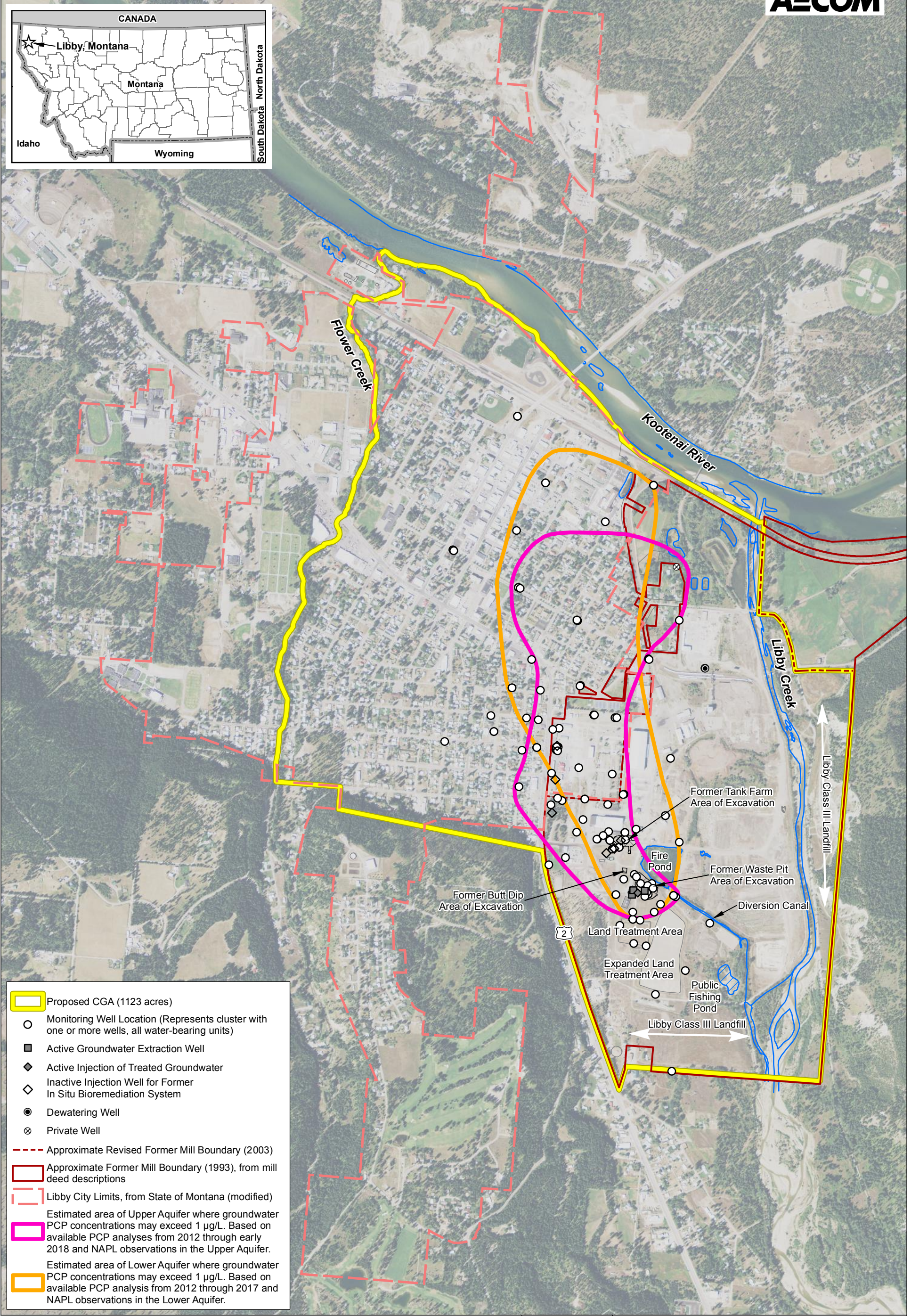
PAHs – polynuclear aromatic hydrocarbons

pg/L – picogram per liter

TCDD – tetrachlorodibenzodioxin

µg/L – micrograms per liter

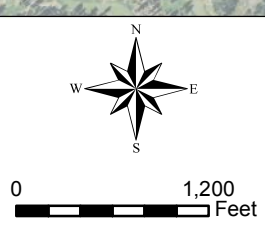
Figures



- Proposed CGA (1123 acres)
- Monitoring Well Location (Represents cluster with one or more wells, all water-bearing units)
- Active Groundwater Extraction Well
- Active Injection of Treated Groundwater
- Inactive Injection Well for Former In Situ Bioremediation System
- Dewatering Well
- X
 Private Well
- Approximate Revised Former Mill Boundary (2003)
- Approximate Former Mill Boundary (1993), from mill deed descriptions
- Libby City Limits, from State of Montana (modified)
- Estimated area of Upper Aquifer where groundwater PCP concentrations may exceed 1 µg/L. Based on available PCP analyses from 2012 through early 2018 and NAPL observations in the Upper Aquifer.
- Estimated area of Lower Aquifer where groundwater PCP concentrations may exceed 1 µg/L. Based on available PCP analysis from 2012 through 2017 and NAPL observations in the Lower Aquifer.

amsl = above mean sea level
Vertical datum: NAVD 88

Aerial Photo Source:
National Agricultural Imagery Program (NAIP)
USDA, 2013

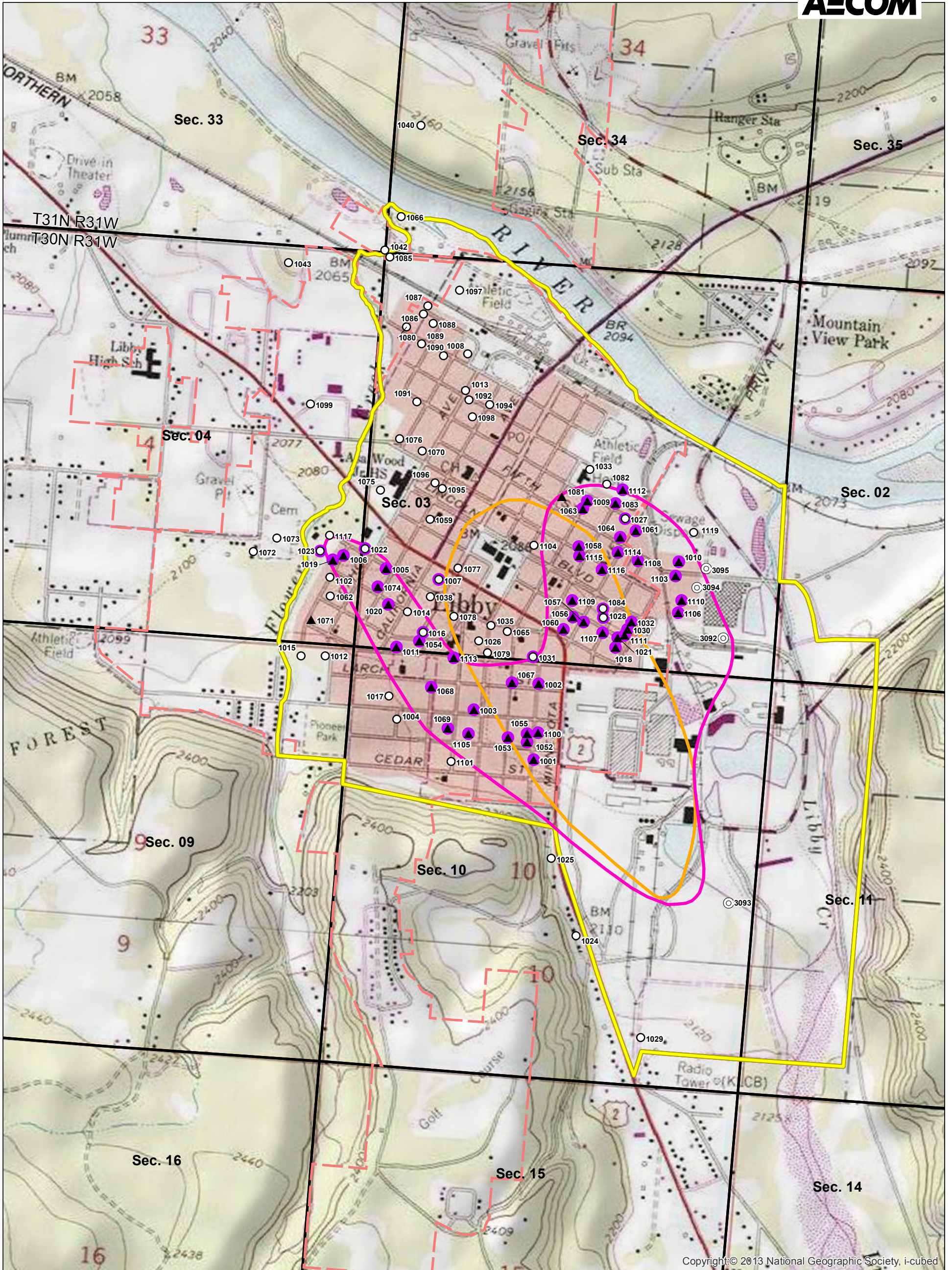


Job No.:	60542657
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Drawn By:	JFR
Date:	6/20/2018

Libby Groundwater Site Location and Proposed Controlled Groundwater Area (CGA)

CONTROLLED GROUNDWATER AREA PETITION SUPPORTING INFORMATION
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 1



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Libby City Limits, from State of Montana (modified)

Proposed CGA (1123 acres)

Section

Former Mill Wells

1000 Series Wells

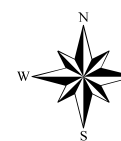
Active or Unknown

Plugged and Abandoned

Private Well Offered Buy Water/Well Program

Estimated Historical Extent of Upper Aquifer Plume (from Figure 9, 1988 Record of Decision)

Estimated Historical Extent of Lower Aquifer Plume (from Figure 9, 1988 Record of Decision)



0 1,200 Feet

Job No.: 60542657

Designed By: MCS

Drawn By: JFR

Date: 6/19/2018

Wells in Buy Water/Well Programs

CONTROLLED GROUNDWATER AREA PETITION SUPPORTING INFORMATION
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 2

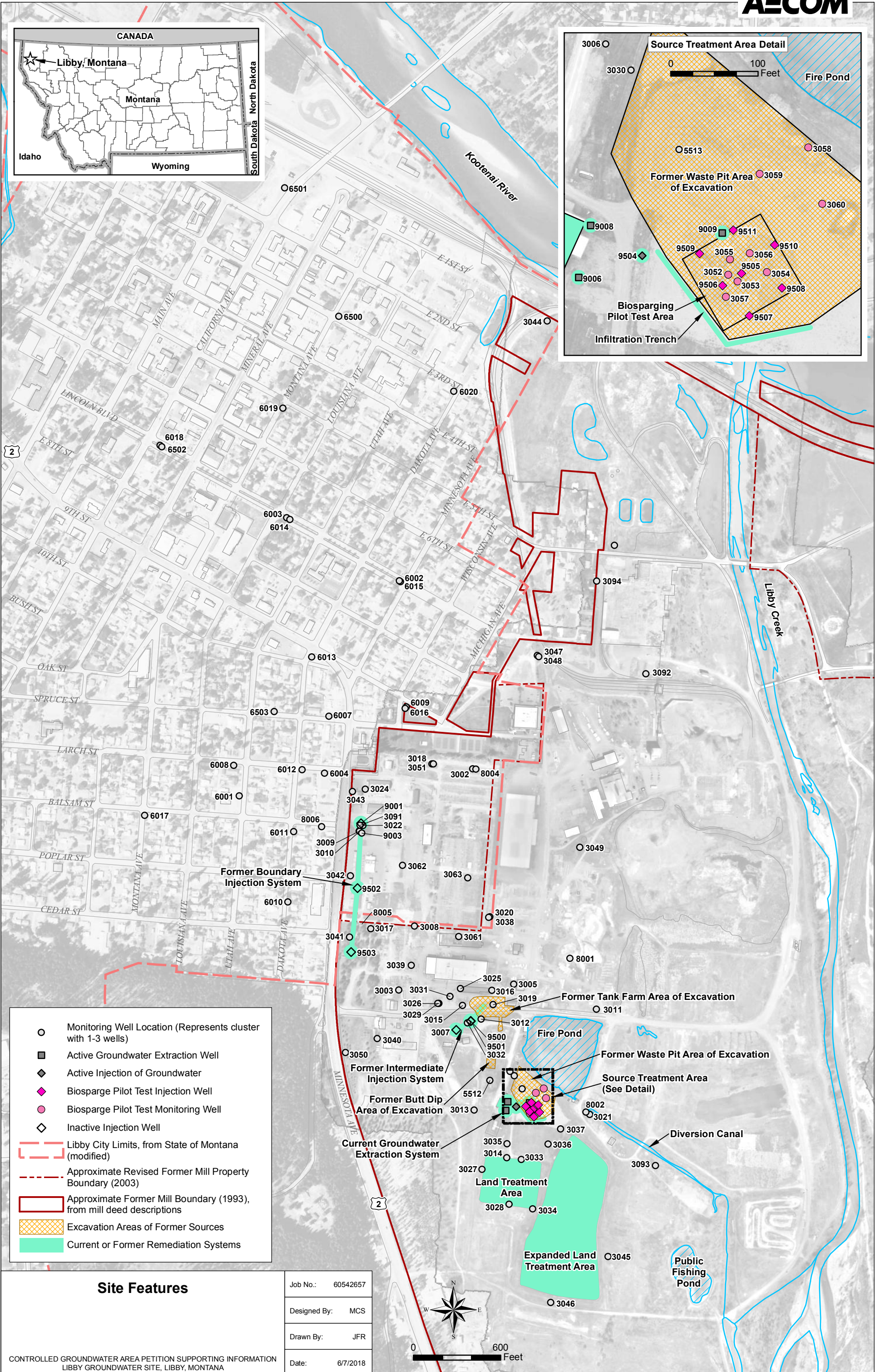
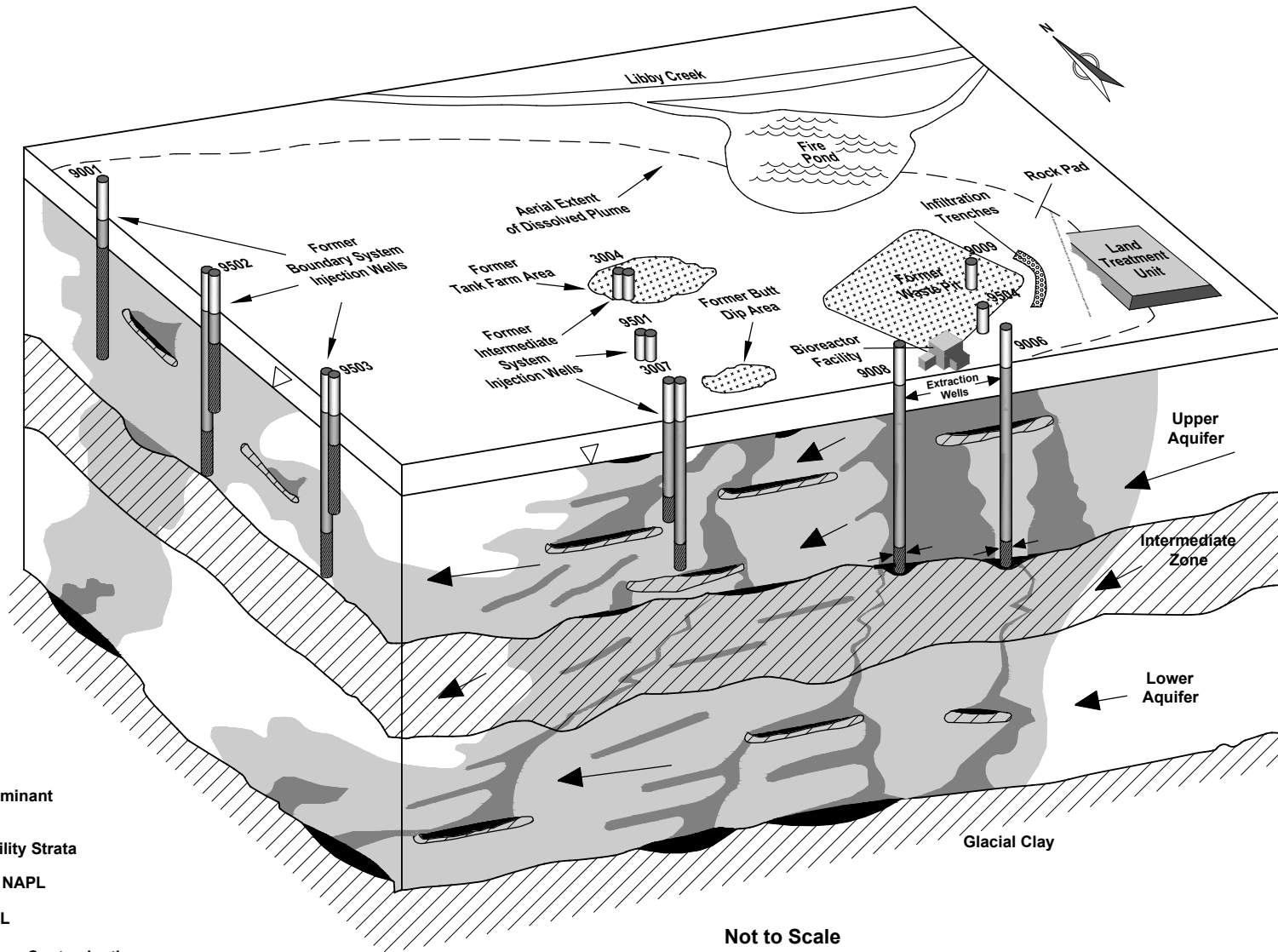









Fig. 3



LEGEND & NOTES:

-  Former Contaminant Source Areas
-  Low Permeability Strata
-  Mobile Phase NAPL
-  Residual NAPL
-  Dissolved Phase Contamination
-  Groundwater Table
-  Groundwater Flow Lines

Not to Scale

Job No. : 60514930	CONCEPTUAL DIAGRAM OF LIBBY AQUIFERS AND CURRENT/HISTORICAL REMEDATION SYSTEMS
Prepared by : MCS	
Date : 7-24-17	

M:\DCS\Projects\Secure\IP\60514930_IP_HFS_Det_An\7.0_CAD_GIS\CUNQUITEK_2.dwg

FIGURE 4

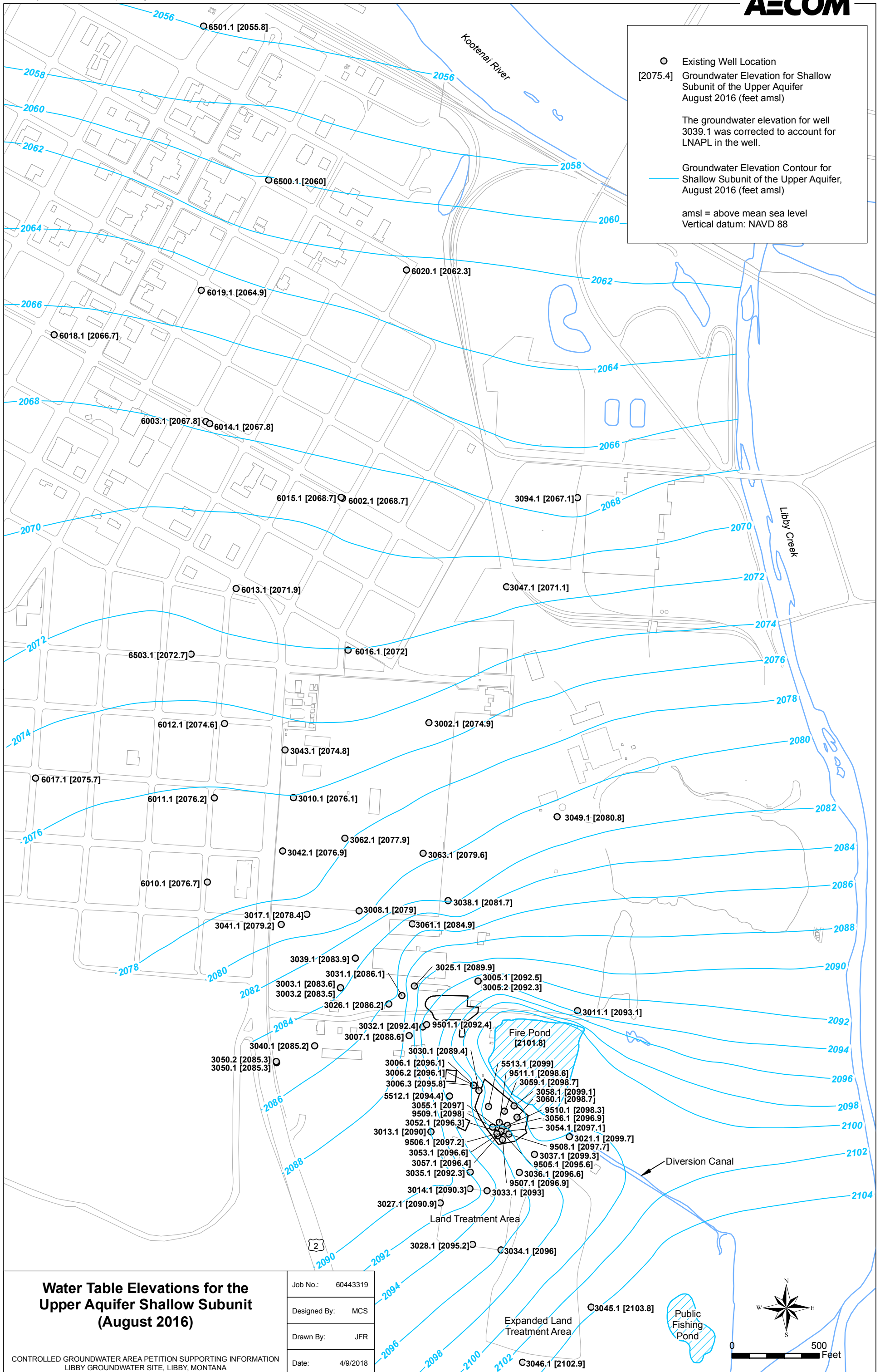
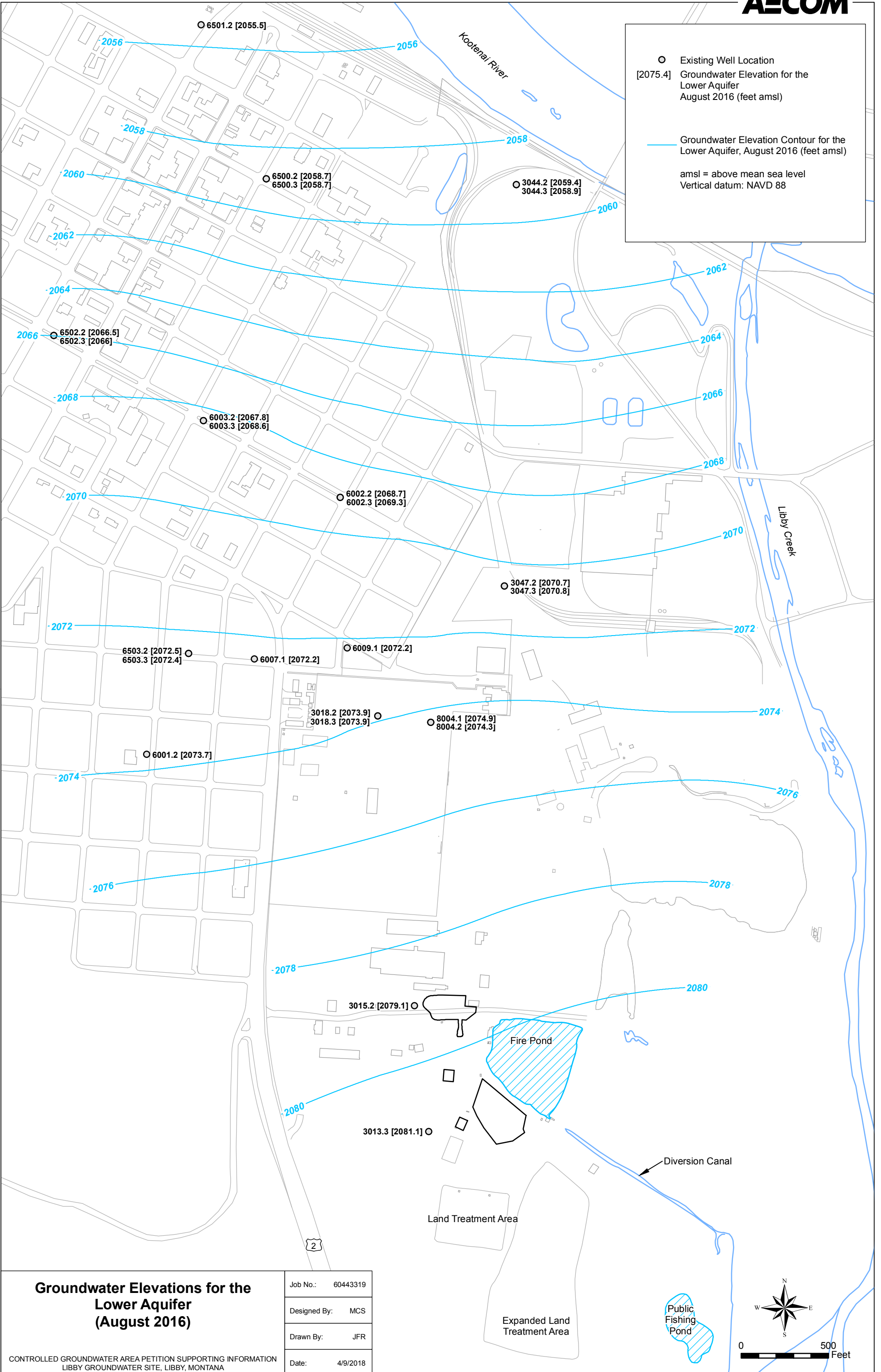


Fig. 5



Groundwater Elevations for the Lower Aquifer (August 2016)

Job No.:	60443319
Designed By:	MCS
Drawn By:	JFR
Date:	4/9/2018

CONTROLLED GROUNDWATER AREA PETITION SUPPORTING INFORMATION
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

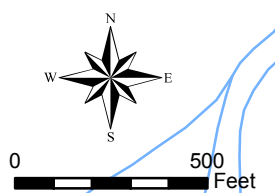


Fig. 6

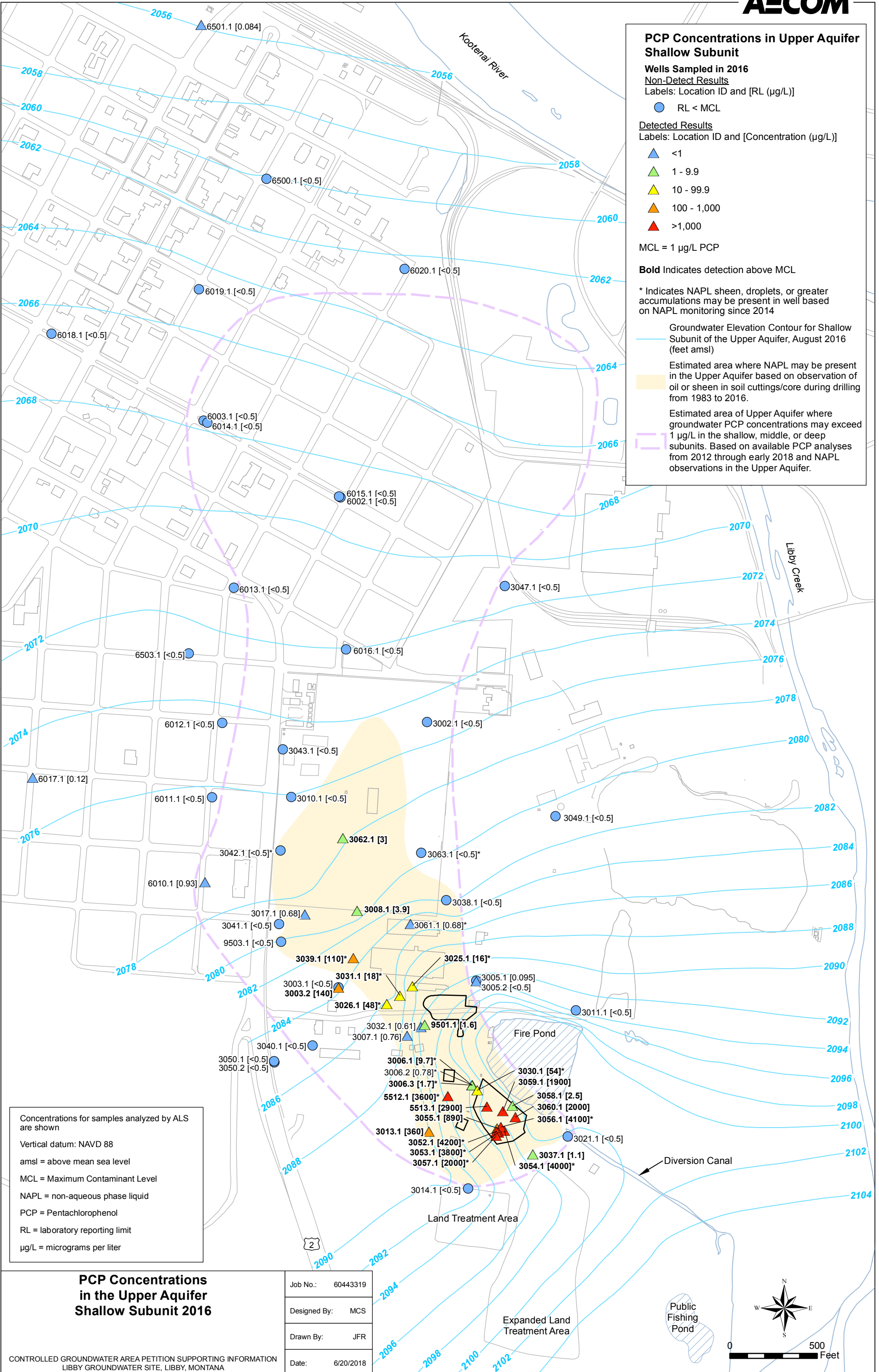


Fig. 7

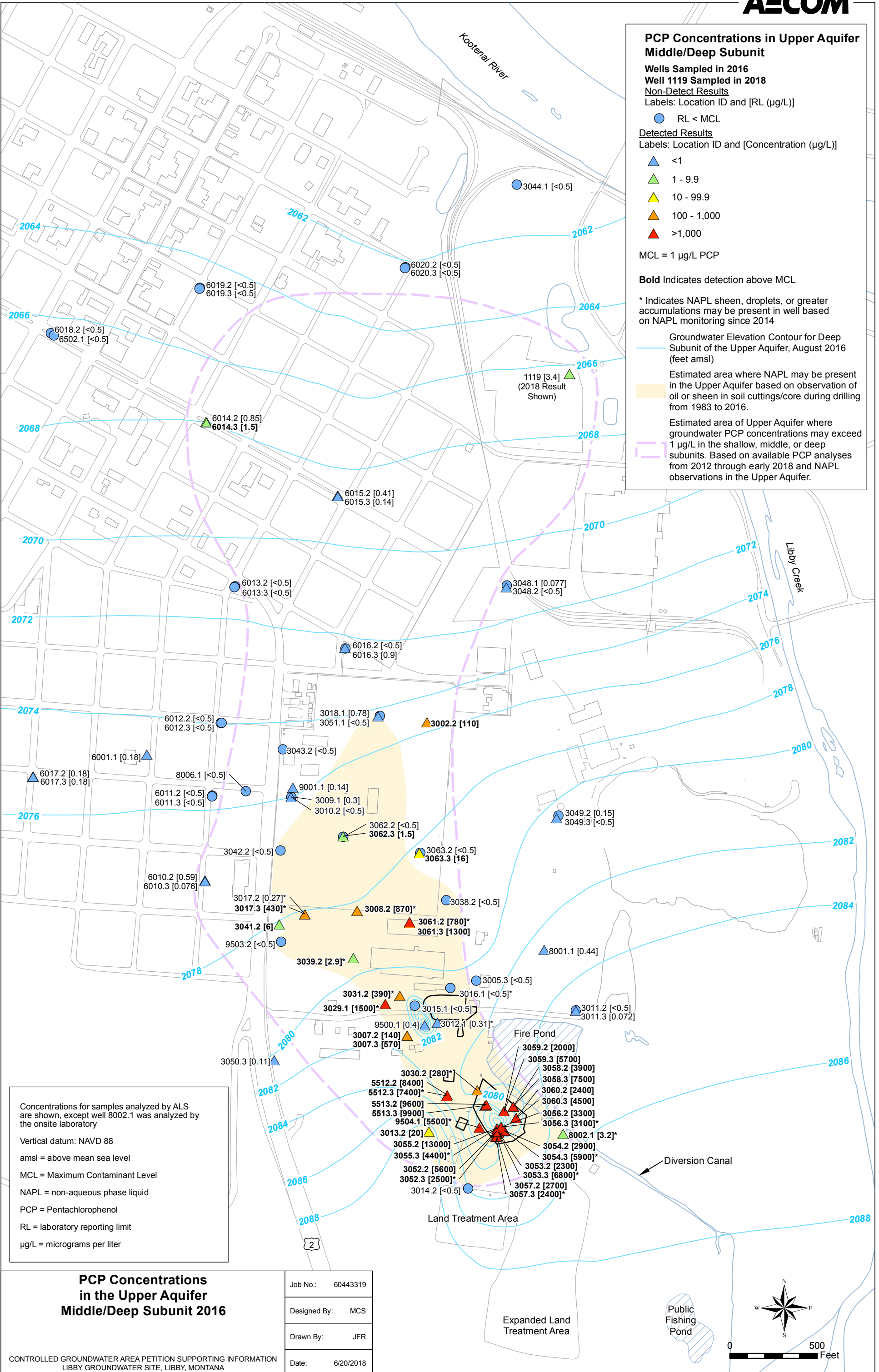


Fig. 8

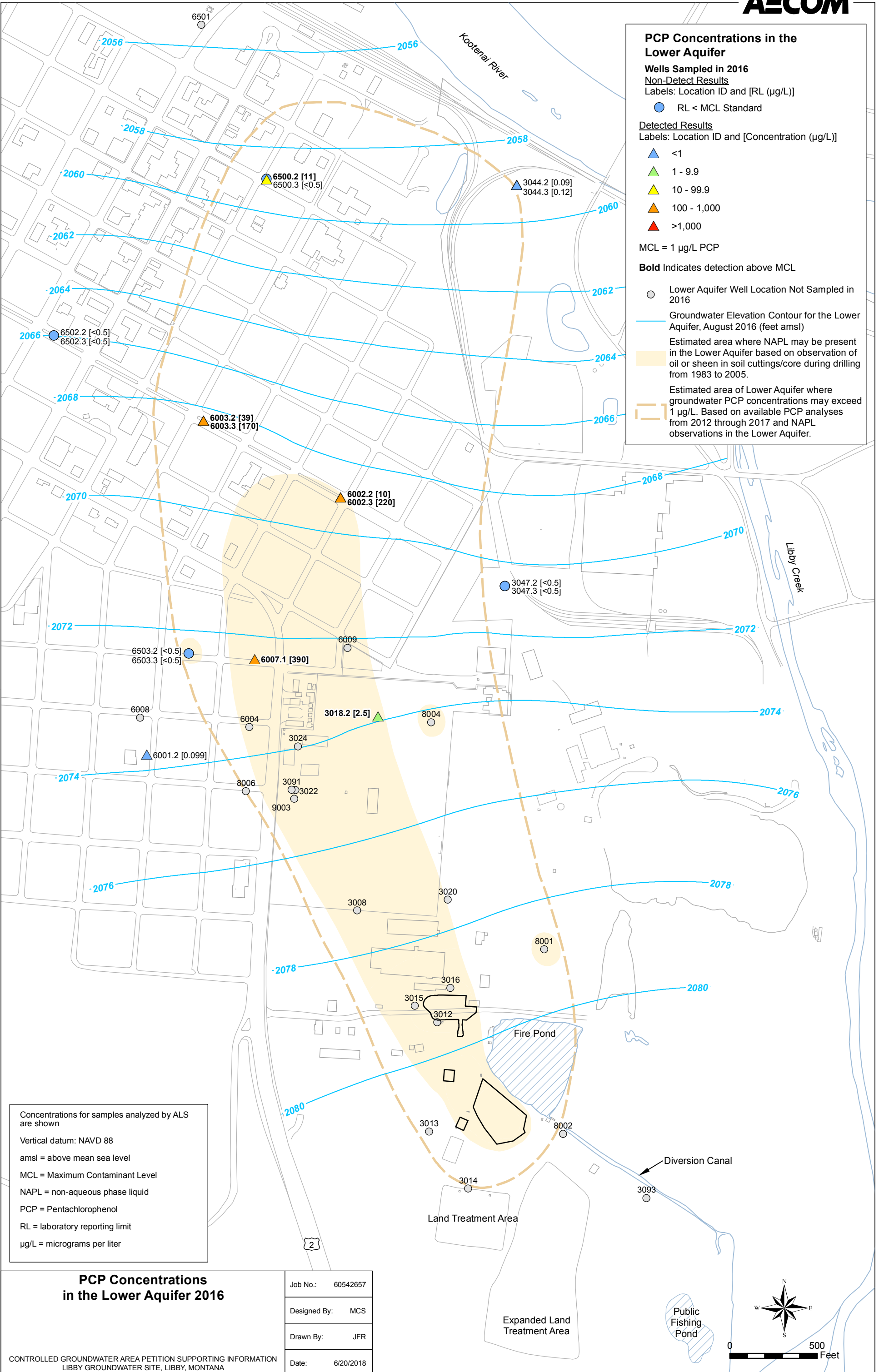
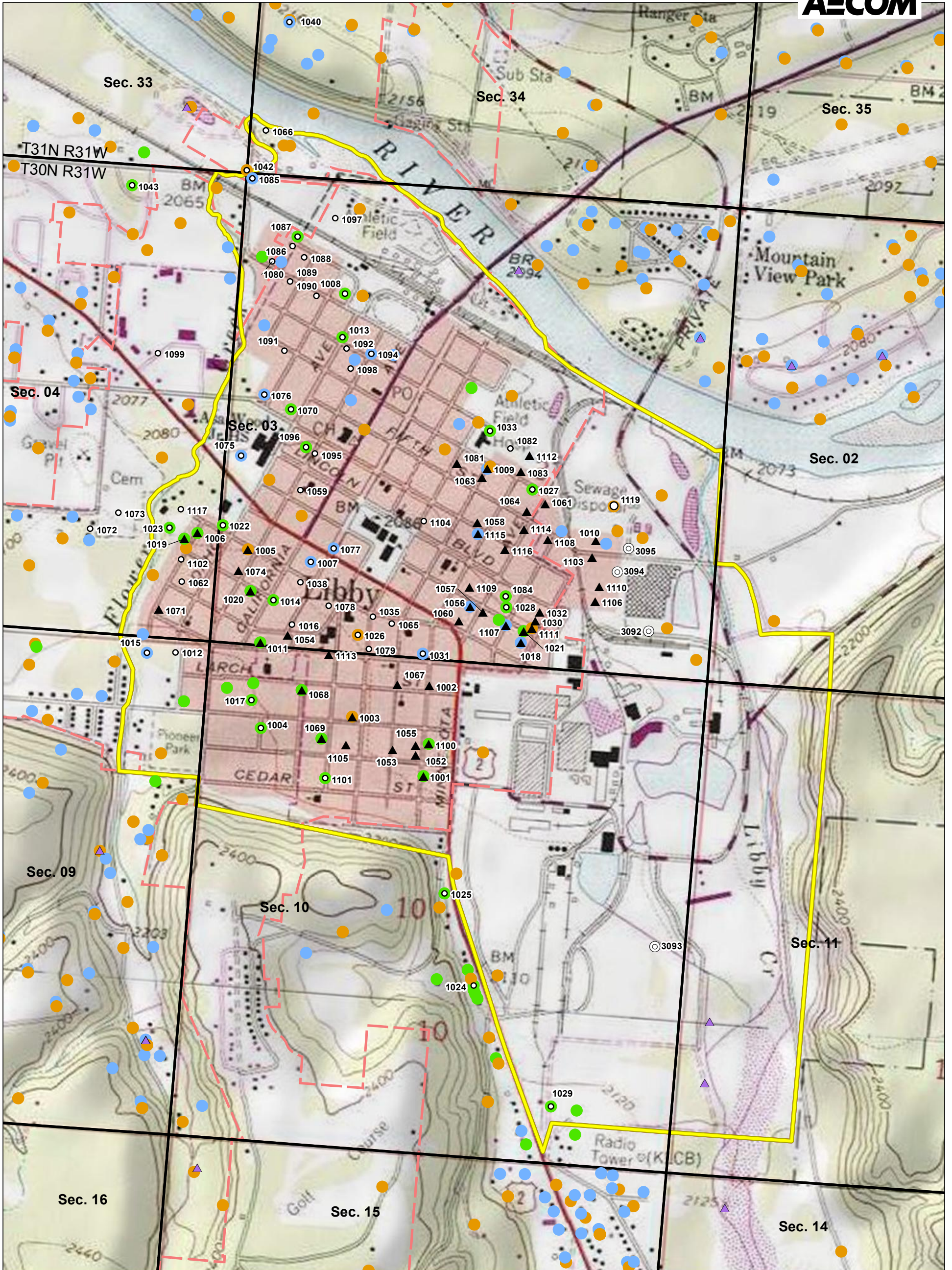


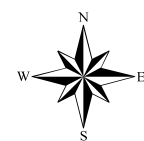
Fig. 9



- Libby City Limits, from State of Montana (modified)
- Proposed CGA (1123 acres)
- Section
- Former Mill Wells
- 1000 Series Wells**
- Active or Unknown
- Plugged and Abandoned

- Approximate Location for Water Rights and Recorded Well Reports (Excluding Monitoring and Remediation Wells)
- Active Groundwater Right
 - Active Groundwater Right and Well Report
 - Well Report
 - ▲ Active Surface Water Right

The locations of water rights and well reports are from the State of Montana database. These locations were modified from the State database if a more accurate location was known or if the State location was known to be incorrect and the correct location was known (based on parcel or other information). Groundwater rights and well report locations were matched to 1000 series well locations, if it could be reasonably confirmed as the same well.



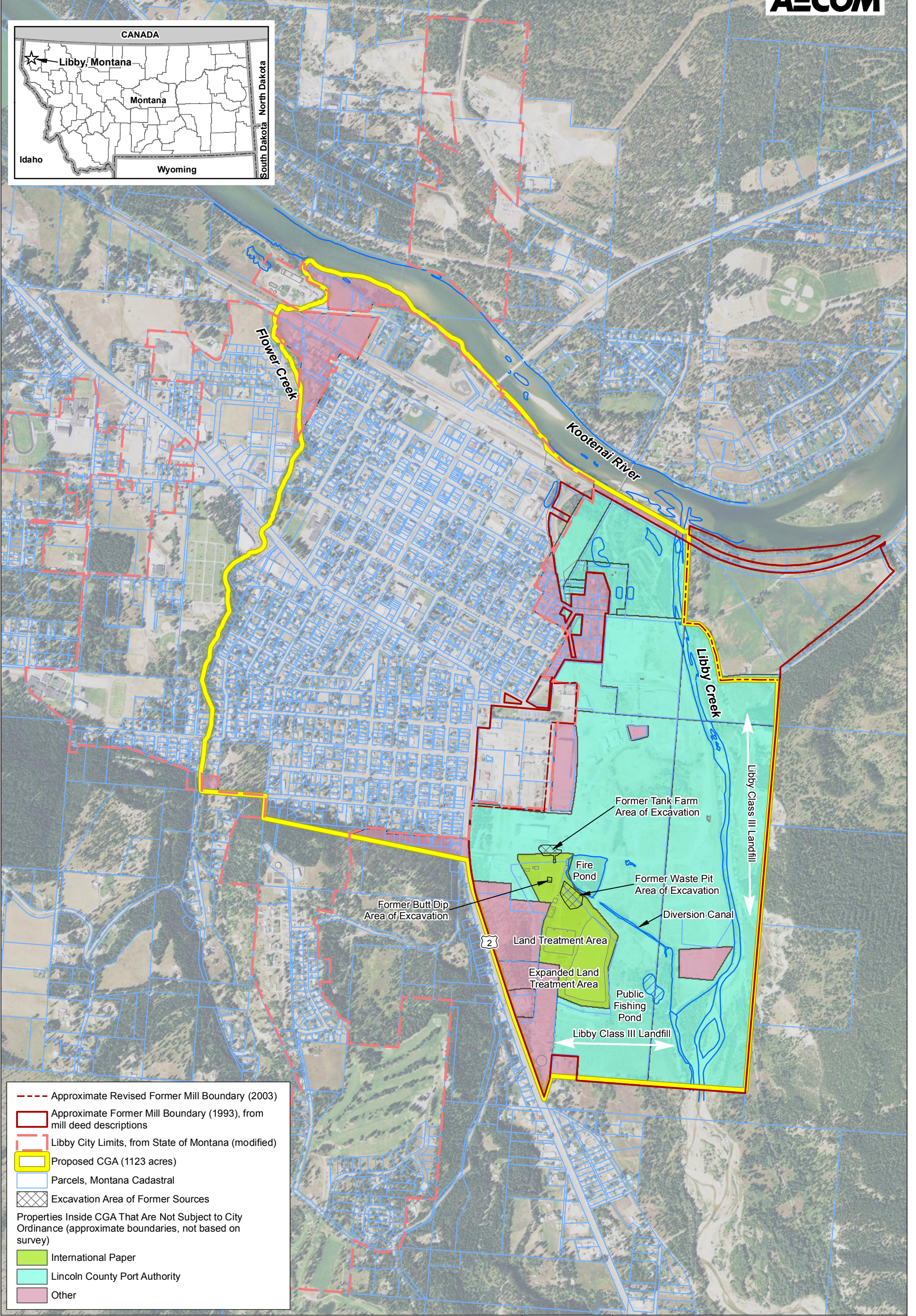
0 1,200 Feet

Job No.:	60542657
Designed By:	MCS
Drawn By:	JFR
Date:	6/20/2018

Potential Groundwater Users in and Around the CGA

CONTROLLED GROUNDWATER AREA PETITION SUPPORTING INFORMATION
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 10



- Approximate Revised Former Mill Boundary (2003)
- ▭ Approximate Former Mill Boundary (1993), from mill deed descriptions
- ▭ Libby City Limits, from State of Montana (modified)
- ▭ Proposed CGA (1123 acres)
- ▭ Parcels, Montana Cadastral
- ▭ Excavation Area of Former Sources
- Properties Inside CGA That Are Not Subject to City Ordinance (approximate boundaries, not based on survey)
- ▭ International Paper
- ▭ Lincoln County Port Authority
- ▭ Other

amsl = above mean sea level
Vertical datum: NAVD 88

Aerial Photo Source:
National Agricultural Imagery Program (NAIP)
USDA, 2013



0 1,200 Feet

Job No.:	60542657
Designed By:	MCS
Drawn By:	JFR
Date:	6/7/2018

Properties Inside CGA and Outside City Limits

CONTROLLED GROUNDWATER AREA PETITION SUPPORTING INFORMATION
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 11

Appendix A. Numerical Modeling to Evaluate a Proposed Controlled Groundwater Area



Environment

Prepared for
International Paper Company
Memphis, Tennessee

Submitted by
AECOM
Greenwood Village, Colorado
303-694-2770
April 19, 2018

Technical Memorandum: Numerical Modeling to Evaluate a Proposed Controlled Groundwater Area

Libby Groundwater Site, Libby, Montana

Revision 4

DRAFT-FINAL

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1 Introduction

AECOM prepared this Technical Memorandum on behalf of International Paper Company (IP) to present the results of numerical groundwater flow modeling to evaluate a proposed Controlled Groundwater Area (CGA) for the Libby Groundwater Site (Site). A CGA is proposed as an institutional control to restrict groundwater use to minimize changes to the Site-related groundwater plumes and potential exposure of groundwater contaminants of concern (COCs) to human health and the environment.

The groundwater plumes are defined in this document as portions of the Libby valley alluvial aquifers (i.e., the Upper and Lower Aquifers) where Site groundwater COCs exceed groundwater cleanup levels due to historical wood treating operations at the Site. Pentachlorophenol (PCP) is the COC that exceeds the groundwater cleanup level of 1 microgram per liter ($\mu\text{g/L}$) over the largest area in the Upper and Lower Aquifers (Figure 1-1). Wood treating fluids in the form of non-aqueous phase liquid (NAPL) also exist within the Upper and Lower Aquifer plume extents. The numerical modeling was used to assist in evaluating the proposed CGA boundary by simulating the effects of pumping outside the proposed CGA on the groundwater plumes.

2 Flow Model Setup and Calibration

The flow model setup and calibration discussed in Section 2 below is from the *Final Report: Conceptual and Numerical Groundwater Flow and Transport Model, Revision 2, October 4, 2016* (URS 2016). The numerical model was approved by the United States Environmental Protection Agency (EPA) and the Montana Department of Environmental Quality (MDEQ) for the purpose of delineating the area to apply groundwater restrictions as part of institutional controls for the Site.

2.1 Model Type and Code

A steady state groundwater flow model was developed to simulate the average flow conditions in the aquifer for the period of analysis representing low flow to average flow conditions. The observed groundwater levels in August 2012, which represent the low flow to average flow condition, were used as the targets for model calibration.

The numerical groundwater flow model was developed using the United States Geologic Survey (USGS) three-dimensional groundwater flow model code MODFLOW (McDonald and Harbaugh 1988; Harbaugh and McDonald 1996) with the USGS particle tracking code MODPATH (Pollock 1989). Groundwater Vistas version 5.0 (Rumbaugh and Rumbaugh 2005) was used as the user-friendly interface.

2.2 Model Domain and Grid

The model domain was designed to include the controlling hydrogeologic features in the flow regime and the boundaries were far enough away from the Site so that the model results are not influenced by the potential transient boundary effect. The model encompassed the City of Libby and surrounding valley area, including the Kootenai River, Libby Creek, Flower Creek, and areas beyond (see Figure 2-1). The model domain was 27,500 feet wide by 23,000 feet long. The model domain is oriented such that the rectangular grid is parallel to the general groundwater flow direction, which is from south to north toward the Kootenai River. A uniform model grid is specified, with each cell size 100 feet by 100 feet.

2.3 Layers

Figure 2-2 presents a cross section (C-C') across the Libby valley illustrating the general configuration of the model layers. The cross section location is shown on Figure 2-1. The model was divided into three layers to simulate the alluvial materials of the Upper Aquifer (Layer 1), the Intermediate Zone (Layer 2), and the Lower Aquifer (Layer 3) in the central part of the model. The surrounding lacustrine deposits were extended through Layers 1, 2, and 3. The Precambrian rocks were set as no-flow areas of the model, since little water movement through these areas is expected compared to the alluvium of the overlying units.

The bottom elevations of the Upper Aquifer, the Intermediate Zone, and the Lower Aquifer, estimated from boring logs, were extrapolated to the entire model domain as the bottom elevations for Layers 1, 2, and 3.

The top elevation of Layer 1 was extracted from the USGS National Topographic Elevation Dataset (NED) 1/3 arc-second resolution (2003).

The saturated thickness of each model layer is variable as demonstrated on Figure 2-2. The average saturated thickness of each model layer is approximately 50 feet, 40 feet, and 60 feet, respectively, in the Libby valley.

2.4 Boundary Conditions

2.4.1 River Boundaries

The Kootenai River, Libby Creek, Big Cherry Creek, Flower Creek, and Parmenter Creek are simulated as river boundary cells in Layer 1 (Figure 2-1) to simulate interaction between groundwater and surface water in the model.

The fire pond and the diversion canal of Libby Creek to the fire pond are simulated as river cells in Layer 1 (Figure 2-1). The pond surface water elevation was specified at 2101.43 feet above mean seal level (amsl) according to the August 2012 measurement.

The river stage elevation at the Kootenai River was specified at 2049 feet amsl at the USGS gaging station 12303000, based on the monthly average stage during August from 1911 to 1991. The river stage slope for the entire river segment within the model domain was specified following the observed surface water slope of 0.002 in March 1986 (WCC 1986, Plate 2). Using this slope, the river stage elevation at the Highway 37 Bridge was estimated to be 2051.6 feet amsl.

The stage elevations for Libby Creek, Flower Creek, and Parmenter Creek were specified following the estimated surface elevation from the USGS National Topographic Elevation Dataset (NED) 1/3 arc-second resolution (2003).

2.4.2 No Flow Boundaries

The east and west model boundaries are cross-gradient to groundwater flow and were assigned as no-flow boundaries for all three model layers (Figure 2-1). This produced groundwater flow parallel to these boundaries in the model, consistent with the observed condition. The north side of the Kootenai River was set to a no-flow boundary condition in all three layers, simulating the Kootenai River and vicinity as a groundwater discharge zone (i.e., in the model, no groundwater can flow across the river from south to north).

The model bottom (bottom of Layer 3) is also set as a no-flow boundary, to represent the low permeability of glacial till beneath the alluvium. The areas of the model domain underlain by Precambrian rocks were set to no-flow boundaries on the cross-gradient sides of the model domain. The Precambrian rocks likely contribute negligible influence on groundwater flow in the alluvium.

2.4.3 General Head Boundaries and Constant Head Boundaries

The southern boundary of the model that transects Libby Valley is specified as a general head boundary in the three model layers (Figure 2-1). This represents the influx of water into the model domain from the valley, hydraulically upgradient of the model domain.

A general head boundary is also set at the western model boundary in the three layers, where Parmenter Creek enters the model domain. This allows some water to enter the model domain from the mountains to the west.

A constant head boundary was set at the east and west model boundaries in three layers, where the Kootenai River flows into and out of the model domain (Figure 3-1). This allows groundwater to enter and leave the model domain in the aquifers beneath the Kootenai River.

The aquifer head values at the general head and constant head model cells are based on an interpreted groundwater elevation surface in and beyond the model domain area using regional groundwater flow directions presented in Boettcher and Wilke (1978) and available hydraulic head data collected for the Site in August 2012.

2.4.4 Pumping and Injection

It is assumed that dewatering well 3092 has operated for the majority of time over the past 40 years, thus pumping was simulated at a continuous rate of 150 gpm at dewatering well 3092 (Figure 2-3).

In the waste pit source zone, groundwater extraction was simulated at wells 9006 (13 gpm), 9008 (7 gpm), and 9009 (7 gpm). Re-injection was simulated at well 9504 (14 gpm) and at the infiltration trench (two model cells upgradient of the extraction wells) (13 gpm) (Figure 2-3).

2.5 Model Calibration Targets and Parameters

The groundwater steady state flow model was calibrated to the following calibration targets and/or conditions:

- Groundwater elevation measured in August 2012
- Observed vertical hydraulic head differences in August 2012 at well clusters
- Estimated fire pond leakage to the underlying aquifer
- Observed PCP plume migration pathways

The flow model calibration was conducted through an iterative process using particle tracking to confirm that reasonable flow pathways were simulated.

During the model calibration, hydraulic parameters and groundwater recharge (as a steady state boundary condition) were adjusted to match the observed groundwater elevations, hydraulic gradients, and the estimated leakage from the fire pond. Adjustments were made within the reasonable range of field data available. Model parameters that were adjusted during the calibration included:

- Horizontal hydraulic conductivity
- Vertical anisotropy ratio of horizontal versus vertical hydraulic conductivities
- Riverbed conductance
- Recharge

2.6 Model Calibration Approach

The flow model calibration was conducted using manual adjustment following the hydraulic gradient comparison method (Guo and Zhang, 2000). The hydraulic gradient comparison method is the basis for development of the automated parameter estimation program, MODAC, which is a physical concept based inverse modeling program for steady state flow model calibration. The basic concept of the hydraulic gradient method is consistent with Darcy's law and mass balance.

Model calibration is a process to estimate model parameters while it is also a process to gain insight into site conditions. Initial model setup and assumed input parameters are developed based on available data and an understanding of the site conditions. Once multiple data (topography, climate, geology, aquifer tests, grain size, field work knowledge, groundwater levels, hydraulic gradients, groundwater fluxes, stream-aquifer interaction, surface water flow, contamination behavior, plume migration pathways, contaminant concentration variation, etc.) are integrated into a model, there may be inconsistencies between input and output as well as between different inputs. These inconsistencies can be resolved by reasonable adjustment of input parameters or model setup based on site knowledge and professional judgement. The manual adjustment process allows flexibility in the model calibration, while providing valuable information on the relationship of site hydraulic parameters to each other.

2.7 Model Calibration Results

2.7.1 Simulated Groundwater Elevations

The simulated groundwater table for the Upper Aquifer is shown on Figure 2-3. The groundwater table surface closely matches that of the interpreted surface for August 2012, including the hydraulic mounding and steeper hydraulic gradient at the fire pond, the overall hydraulic gradient, and the northern direction of flow to the Kootenai River. The calibration residuals (difference between the simulated and observed water levels at observation wells) are posted on Figure 2-3.

The simulated potentiometric surface for the Lower Aquifer is shown on Figure 2-4. The general configuration of the potentiometric surface closely resembles that of the interpreted surface for August 2012. The calibration residuals are also posted on Figure 2-4.

The observed versus simulated hydraulic heads and their differences are presented in Table 2-1. The simulated residuals at 65 monitoring wells range from -1.003 feet to 0.627 feet with a residual mean of 0.003 feet. The root mean square (RMS) error is 0.2555 feet (Table 2-1), which is the average of the squared differences in measured and simulated heads. The scaled RMS, which is the RMS error divided by the range of target head values (range in observations), is 0.006 or 0.6 percent. The scaled RMS is usually thought to be the best measure of error, if errors are normally distributed. Commonly a scaled RMS error less than 10 percent is accepted. The scaled RMS error for this flow model calibration is 0.6 percent (Table 2-1), which is much better than the commonly accepted criterion.

The simulated and observed hydraulic heads are also plotted on Figure 2-5. Figure 2-5 shows the correlations between observed and simulated water elevations for the Upper Aquifer ($R^2 = 0.9993$) and Lower Aquifer ($R^2 = 0.9998$).

The 2016 Upper Aquifer water table surface (Figure 5 of the CGA Petition) and the 2016 Lower Aquifer groundwater elevation surface (Figure 6 of the CGA petition) compare well to the August 2012 calibrated groundwater elevation surfaces in Figures 2-3 and 2-4, respectively. The groundwater elevations in August 2016 are lower than the August 2012 groundwater elevations used for the model calibration, but by less than one foot on average.

No notable changes to the direction of groundwater flow or the hydraulic gradient have been observed over the past two decades of annual groundwater elevation monitoring for the Upper and Lower Aquifers. Groundwater elevation maps are prepared annually and presented in the annual groundwater monitoring reports. The model calibration to 2012 groundwater level elevations is representative of long-term groundwater elevations and remains a suitable calibration data set representing overall groundwater conditions.

Table 2-1. Simulated and Observed Hydraulic Heads and Calibration Statistics

Name	Model_X	Model_Y	Layer	Observed Head (feet)	Computed (feet)	Residual (feet)
3002.1	501499	1563874	1	2075.39	2075.27	0.12
3003.1	500992	1562352	1	2084.24	2083.91	0.34
3005.2	501781	1562391	1	2092.65	2092.65	-0.01
3007.1	501385	1562078	1	2089.22	2089.53	-0.31
3008.1	501099	1562793	1	2079.48	2079.80	-0.32
3010.1	500722	1563444	1	2076.66	2076.79	-0.13
3011.1	502350	1562221	1	2093.27	2093.25	0.02
3013.1	501510	1561526	1	2090.07	2090.20	-0.13
3013.3	501510	1561525	3	2082.03	2082.04	-0.01
3015.2	501429	1562247	3	2080.00	2080.05	-0.05
3017.1	500799	1562774	1	2079.00	2079.38	-0.38

Table 2-1. Simulated and Observed Hydraulic Heads and Calibration Statistics

Name	Model_X	Model_Y	Layer	Observed Head (feet)	Computed (feet)	Residual (feet)
3018.1	501219	1563909	1	2073.67	2074.67	-1.00
3018.2	501219	1563909	3	2074.59	2074.63	-0.04
3021.1	502304	1561496	1	2100.22	2100.18	0.04
3026.1	501268	1562259	1	2087.00	2086.99	0.00
3032.1	501464	1562127	1	2092.90	2092.30	0.61
3035.1	501735	1561294	1	2091.65	2091.58	0.07
3038.1	501609	1562852	1	2082.70	2082.72	-0.01
3040.1	500844	1562018	1	2085.65	2085.63	0.02
3041.1	500653	1562716	1	2079.93	2079.54	0.39
3042.1	500660	1563137	1	2077.42	2077.65	-0.23
3043.1	500674	1563718	1	2075.33	2075.36	-0.03
3044.1	502012	1566956	1	2061.29	2061.33	-0.04
3044.3	502012	1566956	3	2060.16	2060.16	0.00
3045.1	502429	1560519	1	2100.26	2100.14	0.12
3046.1	502036	1560202	1	2103.02	2102.87	0.15
3047.1	501944	1564655	1	2071.70	2071.68	0.02
3047.3	501944	1564655	3	2071.60	2071.60	0.00
3049.1	502235	1563334	1	2081.29	2081.33	-0.04
3050.1	500625	1561921	1	2085.64	2085.53	0.11
3094.1	502351	1565166	1	2068.54	2068.60	-0.07
5512.1	501617	1561730	1	2093.50	2093.63	-0.13
5513.1	501840	1561671	1	2098.85	2098.93	-0.07
6001.1	499896	1563689	1	2075.41	2075.24	0.17
6001.2	499896	1563689	3	2074.32	2074.26	0.06
6002.1	501003	1565163	1	2069.26	2069.78	-0.51
6002.3	501003	1565163	3	2069.99	2070.04	-0.05
6003.1	500221	1565602	1	2068.28	2068.24	0.05
6003.3	500221	1565602	3	2069.30	2069.04	0.27
6007.1	500512	1564235	3	2072.86	2072.97	-0.12
6009.1	501043	1564299	3	2072.87	2072.95	-0.08
6010.1	500229	1562958	1	2077.17	2077.38	-0.21
6011.1	500269	1563442	1	2076.44	2076.13	0.32
6012.1	500328	1563869	1	2075.06	2074.58	0.48
6013.1	500394	1564644	1	2072.39	2071.76	0.63
6014.1	500243	1565590	1	2068.25	2068.27	-0.02
6015.1	500995	1565167	1	2069.22	2069.76	-0.53
6016.1	501036	1564291	1	2072.67	2073.15	-0.48
6017.1	499245	1563555	1	2076.15	2075.79	0.35
6018.1	499351	1566101	1	2067.24	2067.08	0.16
6019.1	500194	1566355	1	2065.57	2065.34	0.23
6020.1	501370	1566473	1	2063.49	2063.60	-0.10
6500.1	500580	1566989	1	2062.28	2062.24	0.04

Table 2-1. Simulated and Observed Hydraulic Heads and Calibration Statistics

Name	Model_X	Model_Y	Layer	Observed Head (feet)	Computed (feet)	Residual (feet)
6500.3	500580	1566989	3	2060.40	2060.39	0.01
6501.1	500207	1567872	1	2057.53	2057.47	0.05
6501.2	500207	1567872	3	2057.20	2057.23	-0.03
6502.1	499364	1566090	1	2067.32	2067.12	0.20
6502.3	499364	1566090	3	2066.81	2066.76	0.04
6503.1	500135	1564267	1	2073.22	2073.08	0.14
6503.3	500135	1564267	3	2073.00	2072.94	0.06
8004.2	501522	1563873	3	2074.99	2075.00	-0.01
8006.1	500462	1563477	1	2076.42	2076.21	0.21
8006.3	500462	1563477	3	2075.27	2075.37	-0.10
9001.1	500731	1563501	1	2076.68	2076.56	0.12
9501.1	501485	1562140	1	2092.85	2092.98	-0.13

Calibration Statistics	
Residual Mean (feet)	0.003
Abs. Res. Mean (feet)	0.169
Res. Std. Dev. (feet)	0.255
Sum of Squares	4.224
RMS Error	0.255
Min. Residual (feet)	-1.003
Max. Residual (feet)	0.627
Number of Observations	65
Range in Observations (feet)	45.821
Scaled Std. Dev.	0.006
Scaled Abs. Mean	0.004
Scaled RMS	0.006

2.7.2 Simulated Vertical Hydraulic Gradient

The simulated vertical equipotential lines along model column 150 are shown on Figure 2-6. The simulated vertical flow direction is consistent with the general observations in the aquifers. The simulated vertical hydraulic gradient in the vicinity of the fire pond is strongly downward. The downward vertical hydraulic gradient decreases to the north. In the area where well nests 6003 and 6002 are located, the simulated vertical hydraulic gradient becomes slightly upward between the Lower and Upper Aquifers, similar to the observations at the two well nests (Table 2-2). Beyond that area, the simulated vertical hydraulic gradient changes back to downward again, and then changes to upward near the Kootenai River.

The simulated vertical head differences (magnitude and direction) compared well to the observed vertical head differences at various well nests (Table 2-2), especially the upward hydraulic gradient observed from the Lower Aquifer to the Upper Aquifer in the area where well nests 6002 and 6003 are located.

One exception is that the observed upward vertical gradient was not achieved in the model at well nest 3018. Review of 2013 to 2017 water level data at well 3018.1 screened in the UM zone, adjacent well 3051.1 screened in the UD zone, and nearby well 3002.1 screened in the US zone, reveals that the water level elevation in the UM zone is lower than in the US and UD zone, and that there is an overall slight downward hydraulic gradient from

the Upper Aquifer to the Lower Aquifer in this area. Therefore, the model results at this location appear to be a reasonable representation of vertical hydraulic gradient.

Table 2-2. Simulated and Observed Vertical Head Differences

Well Pair	Screen Designation	August 2012 Water Level (Feet)	Observed Head Difference (feet)	Observed Direction	Simulated Water Level (feet)	Computed Head Difference (feet)	Simulated Direction
6501.1	UA	2057.53	0.33	Down	2057.47	0.25	Down
6501.2	LA	2057.20			2057.23		
6500.1	UA	2062.28	1.88	Down	2062.24	1.85	Down
6500.2	LA	2060.40			2060.39		
6502.1	UA	2067.32	0.51	Down	2067.12	0.35	Down
6502.3	LA	2066.81			2066.76		
6003.1	UA	2068.28	-1.02	Up	2068.24	-0.80	Up
6003.3	LA	2069.30			2069.04		
6002.1	UA	2069.26	-0.73	Up	2069.78	-0.26	Up
6002.3	LA	2069.99			2070.04		
6503.1	UA	2073.22	0.22	Down	2073.08	0.14	Down
6503.3	LA	2073.00			2072.94		
3018.1	UA	2073.67	-0.92	Up ¹	2074.67	0.04	Slightly Down
3018.2	LA	2074.59			2074.63		
6001.1	UA	2075.41	1.09	Down	2075.24	0.98	Down
6001.2	IZ/LA	2074.32			2074.26		

Notes:

¹ Review of additional 2013 to 2017 water level data from nearby wells 3051.1 and 3002.1 indicate that the overall vertical hydraulic gradient is slightly downward in the area of well nest 3018.

IZ = Intermediate Zone

LA = Lower Aquifer

UA = Upper Aquifer

2.7.3 Model Water Budget

The model simulated water budget is presented in Table 2-3. For the entire model domain, the total groundwater recharge is approximately balanced with the groundwater discharge out of the model through river cells.

For the simulated stream-aquifer interaction, the groundwater inflow from the surface water leakage at the fire pond was estimated to be 3.73 cfs (1,700 gpm), which is a little less than the observed high-end field estimate of 5.2 cfs (2,400 gpm) (WCC 1986).

Table 2-3. Model Water Budget**(A) Entire Model**

	Inflow to Aquifer (cfs)	Outflow from Aquifer (cfs)	Net Inflow to Aquifer (cfs)
Constant Head	0.44	0.23	0.21
General Head	0.14	0.02	0.13
River	8.67	12.48	-3.81
Recharge	3.81	0.00	3.81
Well	0.06	0.39	-0.33
Total	13.12	13.12	0.00

(B) Stream-Aquifer Interaction

	Inflow to Aquifer (cfs)	Outflow from Aquifer (cfs)	Net Inflow to Aquifer (cfs)
Kootenai River	0.03	11.46	-11.43
Libby Creek	0.26	0.95	-0.69
Flower Creek	3.69	0.02	3.67
Parmenter Creek	0.95	0.01	0.95
Fire Pond	3.73	0.00	3.73
Total	8.66	12.43	-3.78

Notes:

The total area and the active area of the model domain are 632,500,000 ft², and 391,620,000 ft², respectively.

cfs = cubic feet per second

2.8 Estimated Flow Model Parameters

2.8.1 Estimated Horizontal Hydraulic Conductivity Distribution

For the initial model run, a simple hydraulic conductivity (K) distribution was used, based on average estimated K values for specific subsurface material types (e.g. alluvial, lacustrine, etc.) and/or areas of aquifer (e.g., up-valley, mid-valley, down-valley, uplands, etc.) known to have characteristically different K values. The initial spatial distribution of these K zones was based on geologic interpretation of where material type changes occur in the subsurface. During each subsequent model run in the model calibration process, the K distribution was slightly modified by adjusting K values within a Site-representative range to achieve a match to the observed hydraulic heads, observed horizontal and vertical hydraulic gradients, the independently estimated leakage rate at the fire pond, and the interpreted plume migration pathways, as discussed previously in Section 2.5. The adjustment of K values was limited to the range of Site representative values based on cumulative Site knowledge gained from field tests (e.g., pumping and slug tests), subsurface soil logging and sampling (including grain size analysis), water production during drilling, and pumping/injection responses during remedial actions. Additional information on Site K values is presented in URS (2016).

The estimated K value assigned to each model cell represents the average K of the entire layer at that cell. As the Upper Aquifer, Intermediate Zone, and Lower Aquifer are each simulated as a single model layer, the estimated K value represents the average equivalent K of the various geologic strata within the entire saturated thickness of each unit.

The K values are varied spatially in the model for the Upper Aquifer (Layer 1) (Figure 2-7) and the Lower Aquifer (Layer 3) (Figure 2-8) whereas a single K value was used to represent the Intermediate Zone. More field observations (observed groundwater elevations, boring logs, aquifer tests, pumping, etc.) are available for the

Upper Aquifer, thus more spatial variability was justified in the model for the Upper Aquifer. The K values selected to represent each hydrogeologic unit in the model layers are summarized below.

Lacustrine Deposit

A uniform K value of 1 ft/d was used in the model to represent the low permeability fine-grained lacustrine deposits in Layers 1, 2, and 3. There are no hydraulic head or drilling data for this unit. The model K value for the lacustrine deposit is based on professional judgement and is consistent with the range of K values for silt/loess in Freeze and Cherry (1979).

Upper Aquifer

The model K value for the Upper Aquifer ranges from 2.5 ft/d in the upgradient area of the model domain to 440 ft/d farther downgradient toward the Kootenai River (Figure 2-7). The model K values are consistent with the range of K values derived from field tests and observations in the Upper Aquifer (0.21 to ~800 ft/day) (URS 2016). Specifically:

- The model K values in the waste pit source zone are 5 ft/d and 30 ft/d (Figure 2-7), which is in the estimated K range from the field aquifer tests performed in the former waste pit area. The 5 ft/d zone is extended upgradient of the waste pit.
- The model K values in the tank farm source zone are 5 ft/d, 30 ft/d, and 140 ft/d. These K values are within the estimated range of the field aquifer tests conducted in the former tank farm area.
- Downgradient of the source zones toward the Kootenai River, the K values were increased in the model to match the decreased hydraulic gradient and to represent the increase in highly permeable coarse gravel layers in the Upper Aquifer that were observed during drilling. Model K values in this area were 200 ft/d, 230 ft/d, 250 ft/d, 400 ft/d, and 440 ft/d.

Intermediate Zone

A single K value of 2.5 ft/d was selected for the Intermediate Zone in the model based on field observations and professional judgement. This value is within the range of K values for a silty sand in Freeze and Cherry (1979).

Lower Aquifer

The K values used for the Lower Aquifer (Figure 2-8) in most of the model domain are 30 ft/d, 100 ft/d, and 110 ft/d, based on field observations and professional judgement. The K value was reduced to 30 ft/d just downgradient of well nests 6002 and 6003 to allow simulation of the observed upward hydraulic gradient between the Upper and Lower Aquifers in that area. In the area hydraulically upgradient of the former waste pit area, the K value was decreased in the model to 5 ft/d and 2.5 ft/d to match the observed increased hydraulic gradient. The range of K values used in the model to represent the Lower Aquifer is consistent with soil types of silty sand, clean sand, and gravel in Freeze and Cherry (1979).

2.8.2 Estimated Vertical Anisotropic Ratio

The ratio of horizontal hydraulic conductivity to vertical hydraulic conductivity (vertical anisotropy ratio) was estimated to be 10:1 to match the observed vertical hydraulic head differences between the Upper and Lower Aquifers. This ratio was applied uniformly over the three model layers. This ratio is within the range for layered sedimentary materials as discussed by Freeze and Cherry (1979).

2.8.3 Estimated Riverbed Conductance

The riverbed conductance for each river cell is the product of the width of the river in the model cell, the length of the river in the model cell, and the vertical hydraulic conductivity of the riverbed material divided by the thickness of the riverbed. It was assumed that the riverbed contained fine material with a lower hydraulic conductivity than the surrounding aquifer material.

The riverbed conductance for each model cell was estimated during model calibration to be 360 ft²/d for the Kootenai River, 200 ft²/d for Libby Creek, 150 ft²/d for Flower Creek, and 50 ft²/d for Parmenter Creek. A riverbed conductance of 360 ft²/d corresponds with a vertical hydraulic conductivity of 0.18 ft/d for the riverbed material (representing fine-grained material), a model cell size of 100 feet by 100 feet, and an assumed riverbed thickness of 5 feet.

2.8.4 Estimated Groundwater Recharge Rates

The estimated areal groundwater recharge distribution is presented on Figure 2-9. In the Libby Valley and within the City of Libby, the groundwater recharge was estimated to be 5 inches/year during model calibration. This value represents infiltration of precipitation and lawn irrigation combined. This recharge is in addition to recharge supplied by infiltration of losing streams and water bodies (fire pond, Libby Creek, Flower Creek, and Parmenter Creek) which receives runoff from the surrounding mountains and bluffs of lakebed deposits. These additional recharge features are modeled using a river boundary condition, as discussed in Section 2.4.1. The groundwater recharge in the high topographic area of the model domain (bluffs of lakebed deposits) was estimated to be 2.5 inches per year, representing this less permeable area where surface water runoff is greater.

3 Modeling Approach to Evaluate the CGA Boundary

The calibrated numerical groundwater flow model was used to evaluate the suitability of the proposed east and west CGA boundaries located cross gradient (lateral) to the contaminant plumes. The aquifer transmissivity in these areas is high, thus high well yields can be attained, especially in the Upper Aquifer. High to moderate groundwater withdrawals, such as from production wells or multiple low volume wells have the potential to alter the plumes' configuration and draw contaminated groundwater in to pumping wells.

The discussions in Section 3 below pertain to the final model simulations. As modeling is an iterative process, earlier model simulations of other pumping scenarios provided useful insight for developing these final model simulations. Earlier model simulations are summarized in in Section 4.5 (Other Model Simulations).

Pumping wells were simulated in the model just outside the proposed CGA boundary at locations shown in Figure 1-1. The pumping wells were simulated using the MODFLOW well package. Hydraulic heads in the Upper and Lower Aquifers were simulated in the model under steady state pumping conditions. Particle tracking (MODPATH) was used to display groundwater flow paths under non-pumping steady state flow conditions compared to simulated changes in groundwater flow paths under the different pumping scenarios. For the non-pumping and pumping scenarios, particles were allowed to flow under the steady state pumping flow field for 100,000 days (the model default value) or until the particle reached a groundwater discharge point, such as a well or surface water body. This provided a display of the maximum potential change to groundwater flow paths within the contaminant plumes and downgradient to the discharge point.

A total of 8 pumping wells were simulated in the model at 4 locations, with one well pumping the Upper and Lower Aquifers (modeled separately) at each of the 4 locations. One of the pumping locations was near the eastern CGA boundary (near Libby Creek) and three pumping locations were near the western CGA boundary (near Flower Creek) (Figure 1-1). The wells were placed in the model 500 feet on the east side Libby Creek and 500 feet on the west side of Flower Creek, outside the CGA boundary. Pumping wells were not simulated in the low permeable lakebed deposits east of Libby Creek outside the southern portion of the east CGA boundary because well yields would be very low, less than 5 gpm, and unlikely to affect the plumes across Libby Creek. However; wells were simulated west of Libby Creek inside the proposed CGA boundary in earlier model simulations (Section 4.5).

The pumping rates selected for model simulations were the estimated maximum yield for each Upper Aquifer and Lower Aquifer pumping well, based on the optimum well design for the maximum available drawdown. According to Driscoll (1986), screening the bottom one-third to one-half of an unconfined aquifer (e.g., Upper Aquifer) provides the optimum design, when the aquifer thickness is less than about 150 feet. A well in an unconfined aquifer is usually pumped so that at maximum capacity, the pumping water level is maintained slightly above the top of the screen. The well screen is positioned in the lower portion of the unconfined aquifer because the upper part is dewatered during pumping. In a confined aquifer (e.g., the Lower Aquifer), 80 to 90 percent of the aquifer thickness should be screened, assuming that the pumping water level will not drop below the top of the aquifer.

Maximum available drawdown for confined conditions should be the distance from the potentiometric surface to the top of the aquifer.

The maximum available drawdown for each pumping well was initially estimated analytically using the Jacob's distance-drawdown method, for pumping durations up to 10 years (an assumed time to reach near steady state conditions). The aquifer transmissivity used in the calculation was based on the model calibrated horizontal hydraulic conductivity and aquifer thickness at each pumping well model cell. Figures 2-7 and 2-8 show the calibrated horizontal hydraulic conductivity values used in the model for the Upper Aquifer and Lower Aquifers, respectively.

The maximum yield for the Upper Aquifer pumping wells was assumed to be the pumping rate that produces a drawdown in the aquifer adjacent to the pumping well approximately one-half the aquifer thickness (i.e., drawdowns of 20 to 30 feet, depending on the pumping well location). The maximum yield for the Lower Aquifer pumping wells was assumed to be the pumping rate that produces a drawdown in the aquifer adjacent to the pumping well approximately 10 to 20 feet above the top of the Lower Aquifer (i.e., drawdowns of 50 to 80 feet, depending on the pumping well location). Table 3-1 provides the estimated maximum pumping rates that were simulated in the model for the Upper and Lower Aquifers.

Table 3-1. Pumping Rates Used in the Model to Evaluate the East and West CGA Boundaries

Simulated Pumping Well Location		Model Pumping Rates (gpm)	
		Upper Aquifer	Lower Aquifer
Near Libby Creek	Northeast	1,000	250
	Northwest	800	600
Near Flower Creek	Midwest	400	200
	Southwest	600	200

Note:

gpm = gallons per minute

Each well was pumped separately in the model simulations. One well pumping at the estimated maximum yield has a similar effect as multiple wells pumping in the area at lower rates. For example, a pumping rate of 800 gpm in the Upper Aquifer near Flower Creek has a similar effect as pumping 800 residential properties in that area at an average rate of 1 gpm each, or four commercial/industrial wells pumping in that area at an average rate of 200 gpm each.

The average drawdown in the model cell containing the pumping well was reviewed for reasonableness (i.e., that not too little or too much drawdown was simulated and that the calculated pumping rate reasonably represents the maximum potential well yield at that location). The model simulated drawdown is an average over the model cell (100 by 100 feet); therefore the model cell drawdown is less than the actual drawdown in the aquifer immediately adjacent to the pumping well.

4 Modeling Results

The model results of pumping Upper and Lower Aquifer wells near Libby Creek in the northeast pumping area are shown on Figure 4-1. The model results of pumping Upper and Lower Aquifer wells near Flower Creek are shown on Figure 4-2 (for the northwest pumping area), Figure 4-3 (for the midwest pumping area), and Figure 4-4 (for the southwest pumping area). The particle flow paths on Figures 4-1 through 4-4 show the cumulative travel time and distance from the particle release point to the CGA boundary to allow comparison of groundwater flow path direction, travel time, and travel distance under non-pumping and pumping scenarios.

At least one particle was released for each pumping scenario at an existing well location within the NAPL-impacted area where PCP is expected to be near the effective solubility of 1,000 µg/L (AECOM 2017) and closest to the simulated pumping well. Thus, particles were released at locations with maximum PCP concentrations and most sensitive to a change in groundwater flow path due to pumping outside the CGA.

The model results are discussed in Sections 4.1 through 4.5 below.

4.1 Northeast Pumping Near Libby Creek

Figure 4-1, left panel, shows the model simulated effects of pumping the Upper Aquifer 1,000 gpm in the northeast area outside the CGA. Two particles were released in this simulation, at wells 3061 and 3002. Well 3061 is the eastern-most location where NAPL exists in the Upper Aquifer and groundwater concentrations are approximately at the PCP effective solubility of 1,000 µg/L. A particle also was released in the model at well 3002. Although well 3002 is outside the estimated NAPL extent in the Upper Aquifer, PCP concentrations in this well are anomalously high (approximately 100 µg/L) compared to nearby wells.

Pumping the northeast well outside the CGA in the Upper Aquifer causes only a small change in groundwater flow direction within the plume (less than 200 feet), and the groundwater velocity under pumping conditions is similar to non-pumping conditions (i.e., particle travel time in days is similar along both the pumping and non-pumping flow paths). Based on these results, minimal Upper Aquifer plume movement would be expected with pumping outside the CGA.

Figure 4-1, right panel, shows the model simulated effects of pumping the Lower Aquifer 250 gpm in the northeast area outside the CGA. One particle was released at well 8001, the eastern-most location where NAPL has been observed in the Lower Aquifer. Well 8001 is a 1-inch diameter well, originally installed for geotechnical purposes, thus it has not been sampled for chemical analysis.

Pumping the northeast well outside the CGA in the Lower Aquifer has the potential to divert groundwater flow from within the NAPL-impacted source area toward the pumping well, as shown in Figure 4-1 (right panel). However; the PCP plume is estimated to remain well within the boundaries of the CGA, due to natural attenuation of dissolved PCP along the groundwater flow path caused by adsorption, dispersion, and biodegradation. Assuming a maximum PCP concentration of 1,000 µg/L PCP at well 8001 and an estimated bulk attenuation half-life of 217 days for PCP in the Lower Aquifer (Attachment 1), PCP will reduce from 1,000 µg/L to the groundwater cleanup level of 1 µg/L along the groundwater flow path in 10 half-lives (or 2,170 days), or just beyond the 2,000 day time step location 1,618 feet downgradient of well 8001.

Due to natural attenuation along the flow path and groundwater pumping restrictions within the CGA boundary, there should be no exposure to the low concentrations in the Lower Aquifer that could be shifted eastward.

4.2 Northwest Pumping Near Flower Creek

Figure 4-2, left panel, shows the model simulated effects of pumping the Upper Aquifer 800 gpm in the northwest area outside the CGA. One particle was released in this simulation, at well 3057, located in the former waste pit source area where NAPL is present and groundwater concentrations are approximately at the PCP effective solubility of 1,000 µg/L. The flow path from well 3057 is west of other flow paths originating in the NAPL-impacted area in the Upper Aquifer, thus it is the most sensitive to changes in flow path due to pumping on the west side of the plume.

Pumping the northwest well outside the CGA in the Upper Aquifer causes only a small change in groundwater flow direction within the plume (100 feet or less), and the groundwater velocity under pumping conditions is similar to non-pumping conditions (i.e., particle travel time in days is similar along both the pumping and non-pumping flow paths). Based on these results, minimal Upper Aquifer plume movement would be expected with pumping outside the CGA.

Figure 4-2, right panel, shows the model simulated effects of pumping the Lower Aquifer 600 gpm in the northwest area outside the CGA. One particle was released at well 6004, the western-most location where dense NAPL (DNAPL) accumulations have been observed multiple times in the bottom of the well. Although the well has not been sampled for a number of years, the dissolved PCP concentration in groundwater is assumed to be at the PCP effective solubility of 1,000 µg/L.

Pumping the northwest well outside the CGA in the Lower Aquifer has the potential to divert groundwater flow from within the NAPL-impacted source area toward the pumping well, as shown in Figure 4-2 (right panel). However; the PCP plume is estimated to remain well within the boundaries of the CGA, due to natural attenuation of PCP along the groundwater flow path caused by adsorption, dispersion, and biodegradation. Assuming a

maximum dissolved PCP concentration of 1,000 µg/L PCP at well 6004 and an estimated bulk attenuation half-life of 217 days for PCP in the Lower Aquifer (Attachment 1), PCP will reduce from 1,000 µg/L to the State standard of 1 µg/L along the groundwater flow path in 10 half-lives (or 2,170 days), or just beyond the 2,000 day time step location 3,150 feet downgradient of well 6004.

Due to natural attenuation along the flow path and groundwater pumping restrictions within the CGA boundary, there should be no potential exposure to the low concentrations in the Lower Aquifer that could be shifted westward.

4.3 Midwest Pumping Near Flower Creek

Figure 4-3, left panel, shows the model simulated effects of pumping the Upper Aquifer 400 gpm in the midwest area outside the CGA. Consistent with the northwest Upper Aquifer pumping location, one particle was released for the midwest pumping simulation, at well 3057, located in the former waste pit source area. Pumping the midwest well outside the CGA in the Upper Aquifer causes only a small change in groundwater flow direction within the plume (less than 200 feet), and the groundwater velocity under pumping conditions is similar to non-pumping conditions (i.e., particle travel time in days is similar along both the pumping and non-pumping flow paths). Based on these results, minimal Upper Aquifer plume movement would be expected with pumping outside the CGA.

Figure 4-3, right panel, shows the model simulated effects of pumping the Lower Aquifer 200 gpm in the midwest area outside the CGA. Consistent with the northwest Lower Aquifer pumping location, one particle was released at well 6004, the western-most location where DNAPL accumulations have been observed in the Lower Aquifer. Pumping the midwest well outside the CGA in the Lower Aquifer causes only a small change in groundwater flow direction within the plume (less than 200 feet), and the groundwater velocity under pumping conditions is similar to non-pumping conditions. Based on these results, minimal Lower Aquifer plume movement would be expected with pumping outside the CGA.

4.4 Southwest Pumping Near Flower Creek

Figure 4-4, left panel, shows the model simulated effects of pumping the Upper Aquifer 600 gpm in the southwest area outside the CGA. Consistent with the northwest and midwest Upper Aquifer pumping locations, one particle was released for the southwest pumping simulation, at well 3057, located in the former waste pit source area. Pumping the southwest well outside the CGA in the Upper Aquifer causes a shift in the groundwater flow path up to 450 feet westward along the western edge of the plume. The maximum change is in the most downgradient portion of the plume where concentrations are the lowest, thus the PCP plume would remain well within the boundary of the CGA. The groundwater velocity under pumping conditions is similar to non-pumping conditions up to the 1,300 day time step location near the downgradient edge of the Upper Aquifer plume.

Based on these results, the western edge of the Upper Aquifer PCP plume may move up to 450 feet west due to pumping the southwest well at the estimated maximum yield. However; due to natural attenuation along the flow path and groundwater pumping restrictions within the CGA boundary, there should be no potential exposure to the low concentrations that could be shifted westward.

Figure 4-4, right panel, shows the model simulated effects of pumping the Lower Aquifer 200 gpm in the southwest area outside the CGA. Consistent with the northwest and midwest Lower Aquifer pumping locations, one particle was released at well 6004, the western-most location where DNAPL accumulations have been observed in the Lower Aquifer. Pumping the southwest well outside the CGA in the Lower Aquifer causes only a small change in groundwater flow direction within the plume (200 feet or less), and the groundwater velocity under pumping conditions is similar to non-pumping conditions. Based on these results, minimal Lower Aquifer plume movement would be expected with pumping outside the CGA.

4.5 Other Model Simulations

Other model simulations were performed to confirm that the model scenarios discussed above were appropriately conservative for assessing the CGA boundaries. Particles were released in the model at multiple locations within

the NAPL source areas in the Upper and Lower Aquifers to confirm that the particle tracking simulations shown on Figures 4-1 to 4-4 represent the most sensitive flow paths to pumping outside the proposed CGA.

Also, particle tracking in the Lower Aquifer was evaluated to assess potential changes due to pumping in the Upper Aquifer and particle tracking in the Upper Aquifer was evaluated to assess potential changes due to pumping in the Lower Aquifer. In general, the Lower Aquifer flow paths are affected by pumping the estimated maximum yield in the Upper Aquifer, but generally the effect is less than pumping directly in the Lower Aquifer at the maximum estimated yield. The Upper Aquifer flow paths were minimally changed (e.g., less than 150 feet) by pumping the estimated maximum yield in the Lower Aquifer.

In earlier phases of numerical modeling, six pumping wells were simulated (separately) inside the proposed CGA boundary to evaluate if a smaller CGA on the east and west would be sufficiently protective. Pumping at maximum potential rates at three well locations 500 feet west of Libby Creek and three well locations 500 feet east of Flower Creek inside the proposed CGA resulted in greater flow path movement within the plumes compared to pumping outside the proposed CGA, as would be expected. Also, groundwater flow from the plume area was redirected from its current path to two Upper Aquifer and four Lower Aquifer pumping wells in the simulations. Given the greater potential for pumping to alter the plume configuration and draw contaminated groundwater toward a pumping well, and the need for a sufficient buffer area, the smaller CGA was not considered further.

Early numerical modeling simulations also included pumping in the Libby valley alluvial deposits just outside the south CGA boundary to verify that pumping would not affect groundwater flow paths inside the CGA. Pumping was simulated in one to six wells at a total pumping rate of 6 gpm. No effect on simulated groundwater flow paths was observed inside the CGA, thus the south boundary was considered appropriate.

5 Uncertainty

There are inherent uncertainties in modeling subsurface conditions, thus assumptions were made to develop a conservative yet reasonable delineation of a proposed CGA to restrict groundwater use for the protection of human health and the environment. Groundwater monitoring will be ongoing over the coming years and changes to the CGA boundary or the restrictions within the CGA may be recommended based on the results of future monitoring.

Key uncertainties in this evaluation are as follows:

- The extent of NAPL and PCP in the Upper and Lower Aquifers is based on monitoring data collected to date. Precise delineation of aquifer contamination is not feasible and groundwater impacts may extend beyond the extent shown in the figures.
- Aquifer hydraulic properties are estimates based on available field testing data and groundwater flow model calibration. Actual hydraulic properties may deviate from those used in the evaluation, and actual groundwater flow path direction, travel time, and travel distance under non-pumping and pumping scenarios may vary from that shown in this evaluation.
- Future land and water use inside and outside the CGA boundary may change over time. Potential changes in current and future remedial systems, drainage, surface water bodies, etc. may alter the future groundwater flow paths.

Some conservative assumptions used in this evaluation are as follows:

- The CGA includes a large buffer area in some locations to account for uncertainty in the extent of NAPL and COCs in the aquifers and in the hydraulic properties used to assess the effects of pumping outside the CGA.
- The maximum estimated well yield was used as the pumping rate in the model because the areas outside the CGA will not have limits on pumping rates, number of wells, or well locations other than those required by current water use laws. The future groundwater withdrawal rates may be lower than those simulated.
- Pumping affects groundwater flow paths in the Lower Aquifer more than the Upper Aquifer because the Lower Aquifer is confined, it has larger available drawdown (and may be subjected to greater stress), and it has a

lower hydraulic conductivity than the Upper Aquifer. It is unlikely that the Lower Aquifer will be used when the Upper Aquifer, a shallow aquifer with a higher hydraulic conductivity, is available to pump.

- Steady state pumping conditions were simulated in the evaluation, resulting in maximum groundwater drawdown and flow path modification. Intermittent pumping may cause less drawdown and flow path modification.

6 Summary and Conclusions

Groundwater modeling revealed that pumping outside the CGA in either the Upper or Lower Aquifer can cause some changes in groundwater flow paths within the plumes (typically less than 200 feet), and in some cases, flow paths can be redirected from the plumes to the pumping wells. However; due to natural attenuation along the flow path and groundwater pumping restrictions within the CGA boundary, there should be no potential exposure to COC concentrations in the Upper or Lower Aquifer plumes.

If pumping were to occur outside the CGA at the maximum estimated yield and if pumping were also to occur inside the proposed CGA, then additional plume movement may occur and possible exposure to impacted groundwater may occur. Therefore groundwater use restrictions within the CGA are appropriate.

7 References

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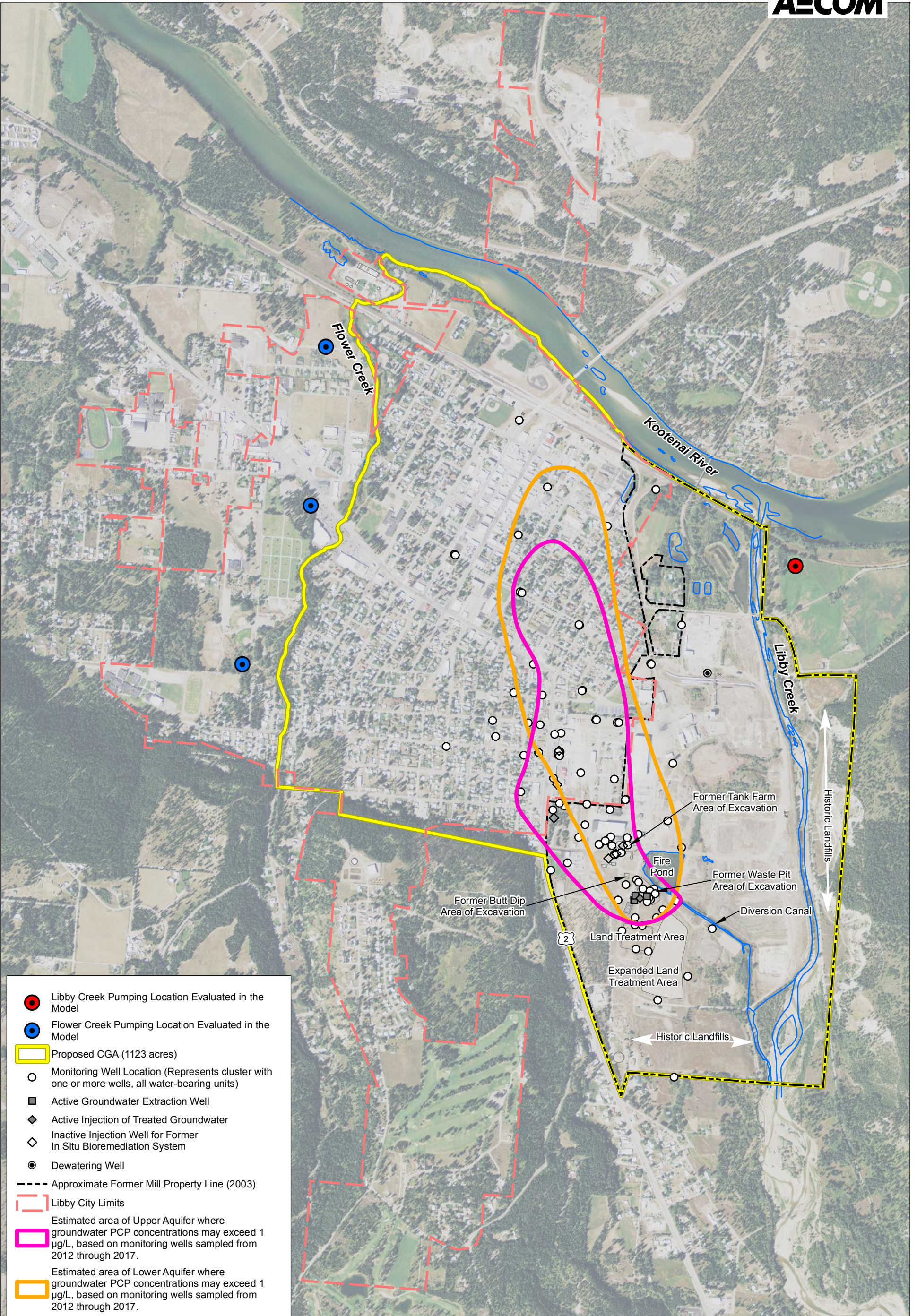
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Figures



- Libby Creek Pumping Location Evaluated in the Model
- Flower Creek Pumping Location Evaluated in the Model
- Proposed CGA (1123 acres)
- Monitoring Well Location (Represents cluster with one or more wells, all water-bearing units)
- Active Groundwater Extraction Well
- Active Injection of Treated Groundwater
- Inactive Injection Well for Former In Situ Bioremediation System
- Dewatering Well
- Approximate Former Mill Property Line (2003)
- Libby City Limits
- Estimated area of Upper Aquifer where groundwater PCP concentrations may exceed 1 µg/L, based on monitoring wells sampled from 2012 through 2017.
- Estimated area of Lower Aquifer where groundwater PCP concentrations may exceed 1 µg/L, based on monitoring wells sampled from 2012 through 2017.

amsl = above mean sea level
Vertical datum: NAVD 88

Aerial Photo Source:
National Agricultural Imagery Program (NAIP)
USDA, 2013



0 1,200 Feet

Job No.: 60542657

Designed By: MCS

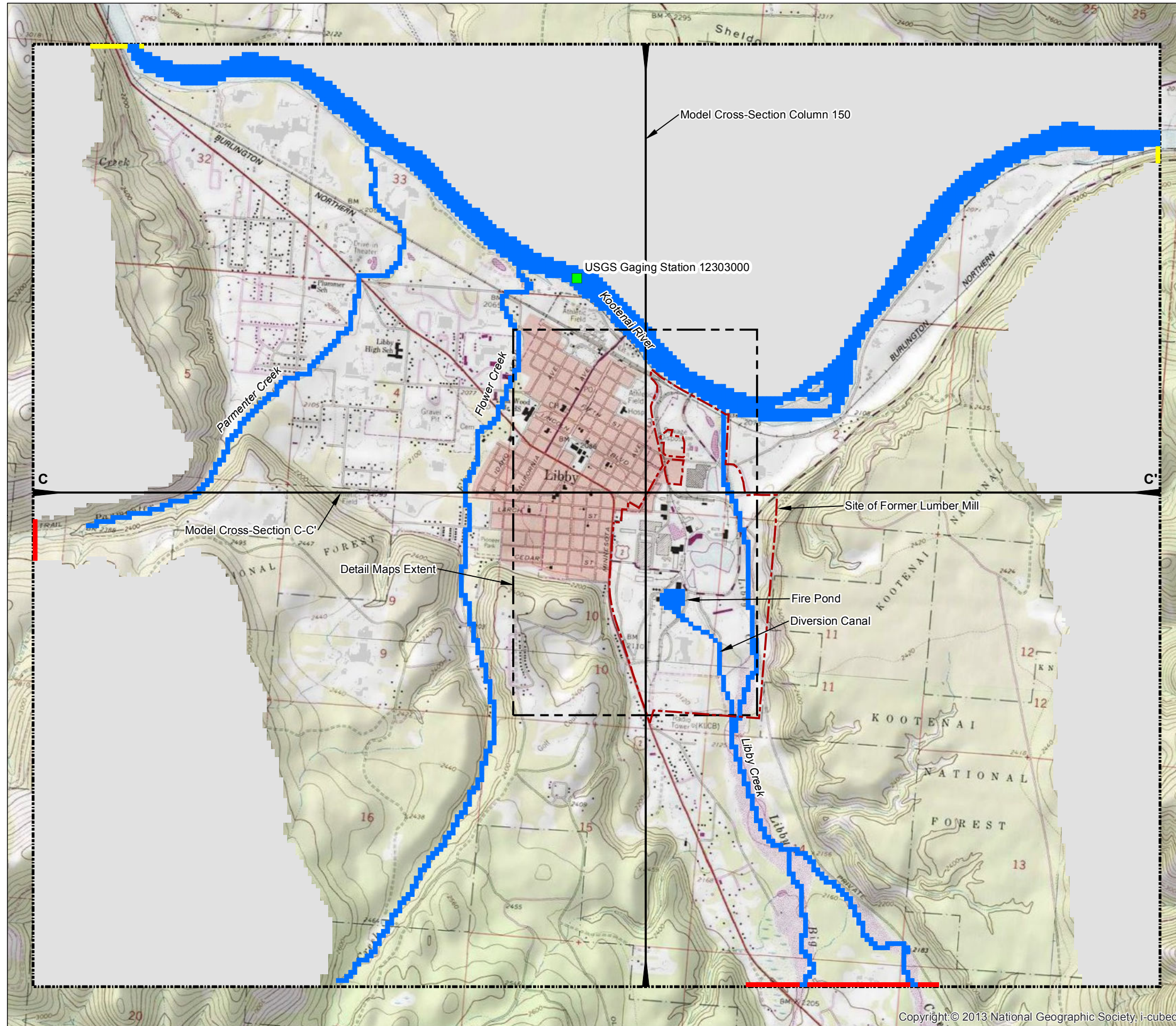
Drawn By: JLC

Date: 4/18/2018

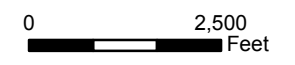
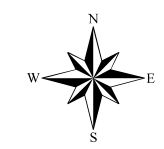
Proposed Controlled Groundwater Area (CGA)

NUMERICAL MODELING
TO EVALUATE A CONTROLLED GROUNDWATER AREA
LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 1-1



- Model Domain
- Constant Head Boundary
- General Head Boundary
- River Cells
- No-Flow
- Historical Mill Property

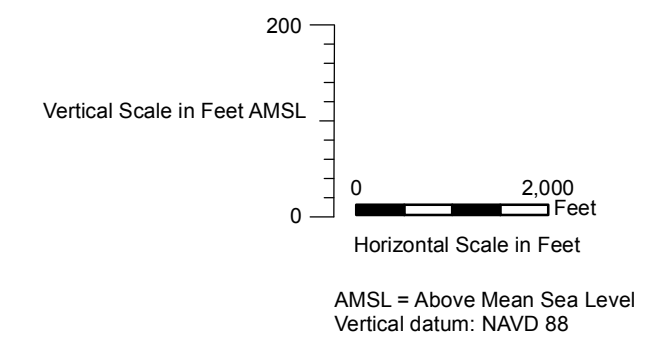
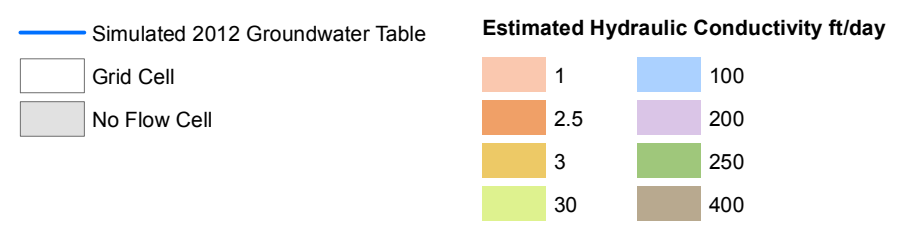
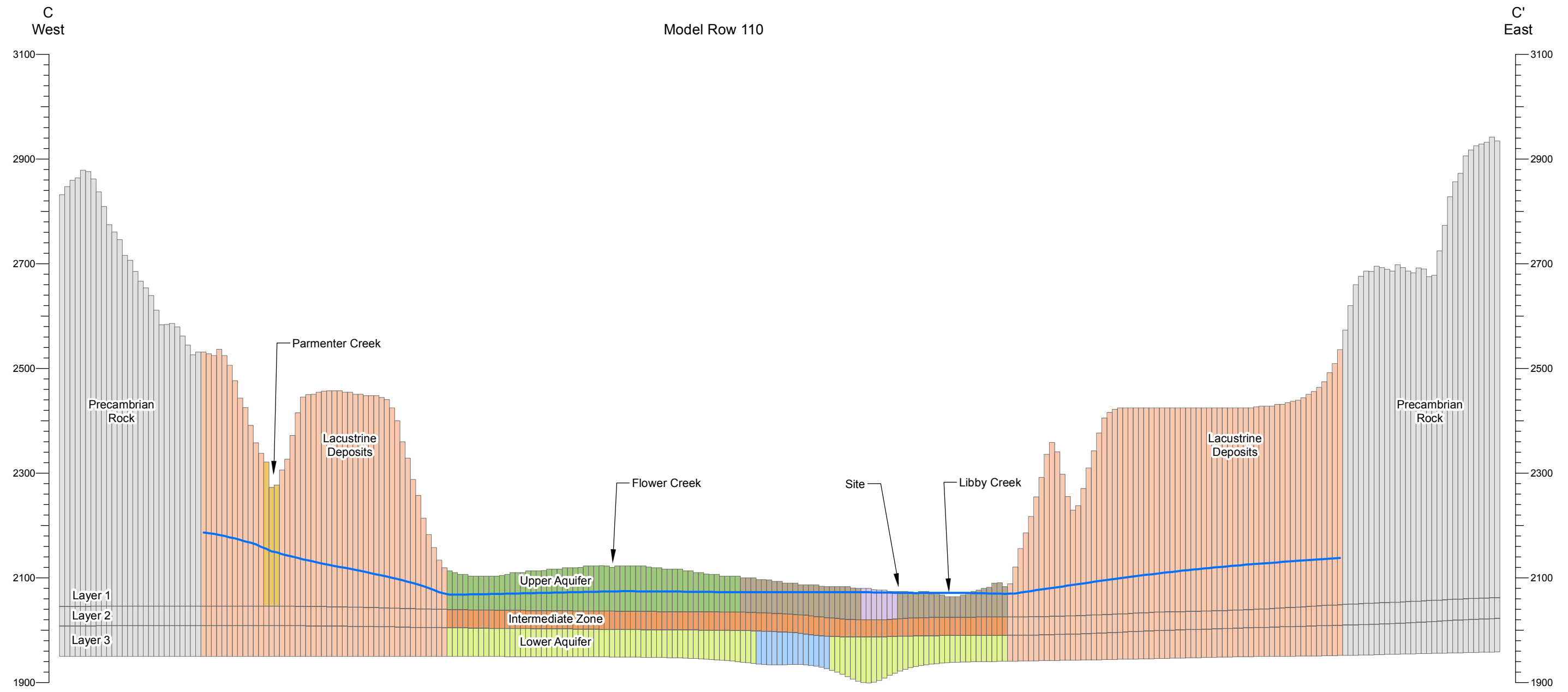


Job No.:	22243124
Designed By:	CMZ
Drawn By:	JLC
Date:	10/23/2017

Model Domain with Boundary Conditions

FROM FIGURE 5.1 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2

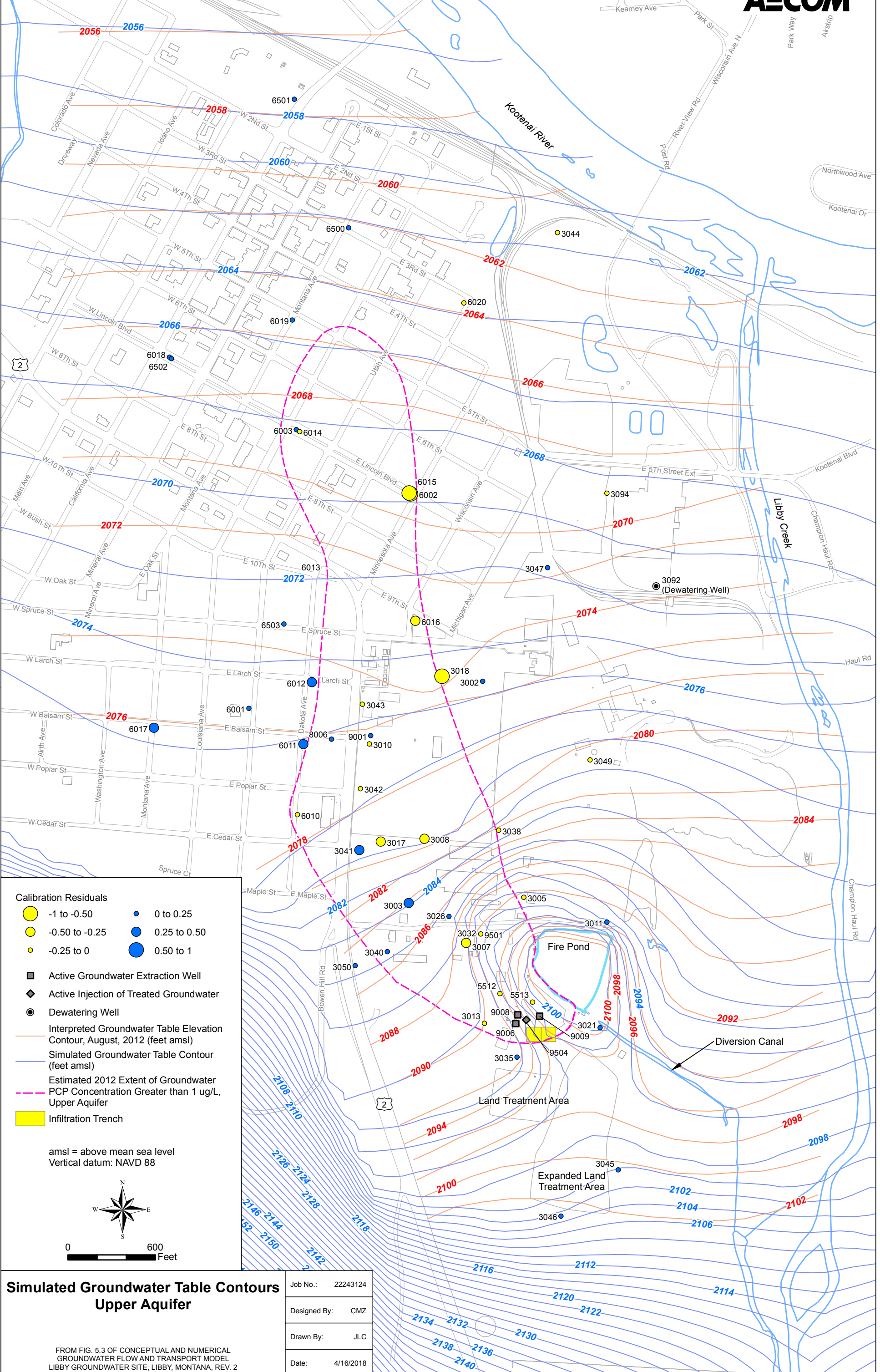
Fig. 2-1



See cross-section line on Figure 5.1

Job No.:	22243124	Model Cross Section C-C'
Designed By:	CMZ	
Drawn By:	JLC	
Date:	10/04/2016	
FROM FIGURE 5.2 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2		

Fig. 2-2



Calibration Residuals

● -1 to -0.50	● 0 to 0.25
● -0.50 to -0.25	● 0.25 to 0.50
● -0.25 to 0	● 0.50 to 1

■ Active Groundwater Extraction Well
◆ Active Injection of Treated Groundwater
● Dewatering Well

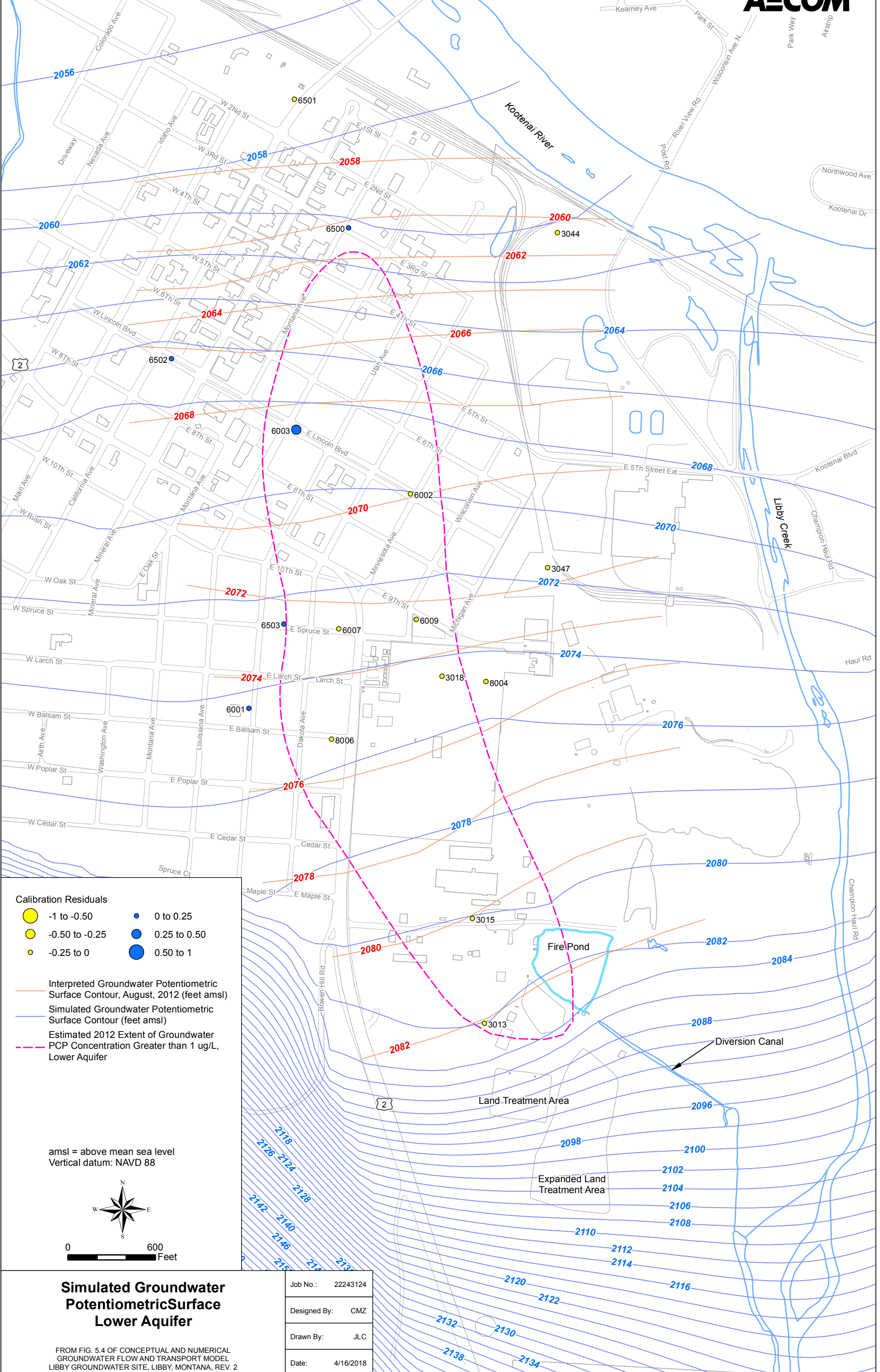
— Interpreted Groundwater Table Elevation Contour, August, 2012 (feet amsl)
— Simulated Groundwater Table Contour (feet amsl)
— Estimated 2012 Extent of Groundwater
- - - PCP Concentration Greater than 1 ug/L, Upper Aquifer
 Infiltration Trench

amsl = above mean sea level
Vertical datum: NAVD 88

Simulated Groundwater Table Contours Upper Aquifer	Job No.: 22243124
	Designed By: CMZ
	Drawn By: JLC
	Date: 4/16/2018

FROM FIG. 5.3 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2

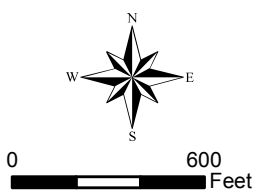
Fig. 2-3



- Calibration Residuals**
- -1 to -0.50
 - -0.50 to -0.25
 - -0.25 to 0
 - 0 to 0.25
 - 0.25 to 0.50
 - 0.50 to 1

- Interpreted Groundwater Potentiometric Surface Contour, August, 2012 (feet amsl)
- Simulated Groundwater Potentiometric Surface Contour (feet amsl)
- Estimated 2012 Extent of Groundwater PCP Concentration Greater than 1 ug/L, Lower Aquifer

amsl = above mean sea level
Vertical datum: NAVD 88



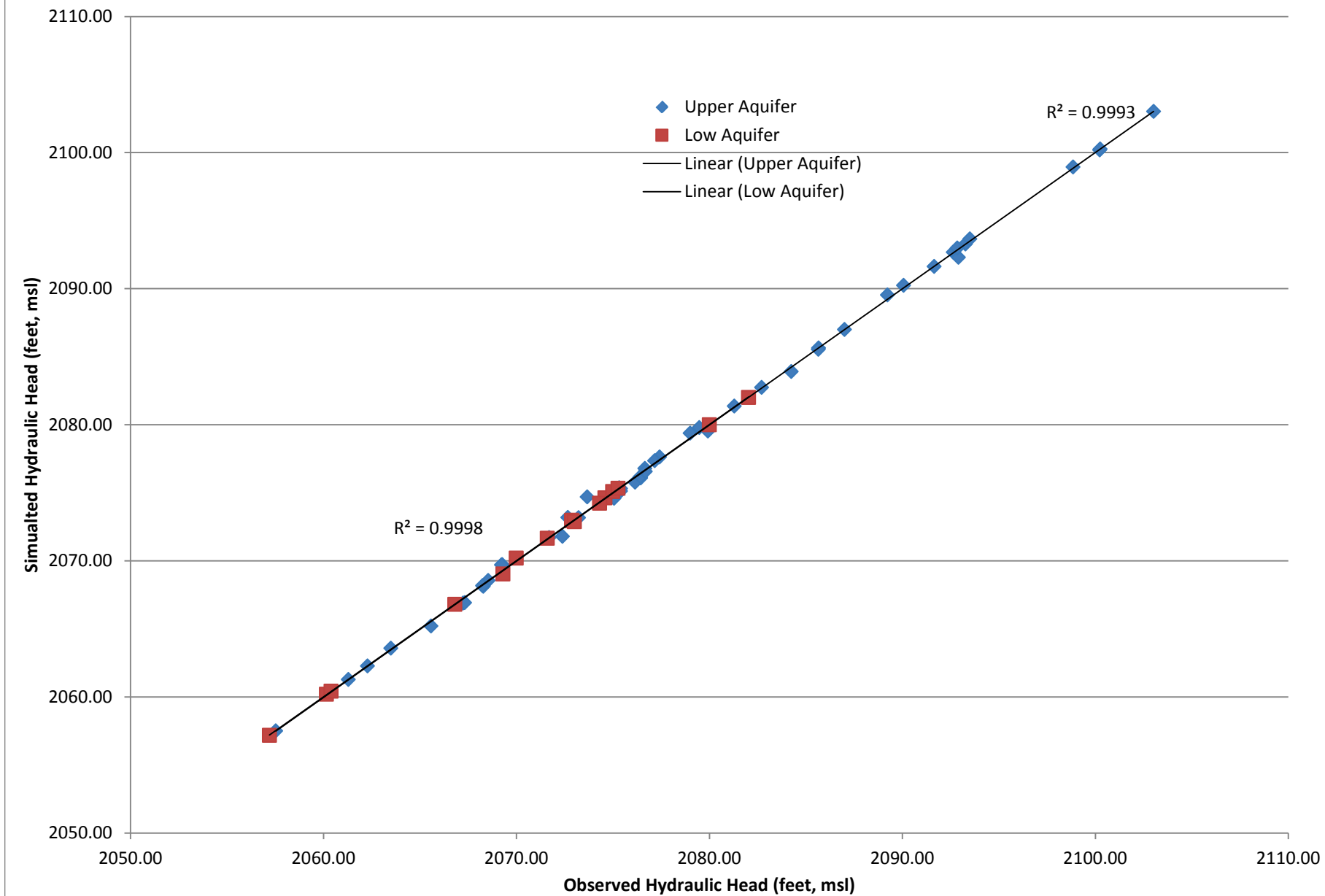
Simulated Groundwater Potentiometric Surface Lower Aquifer

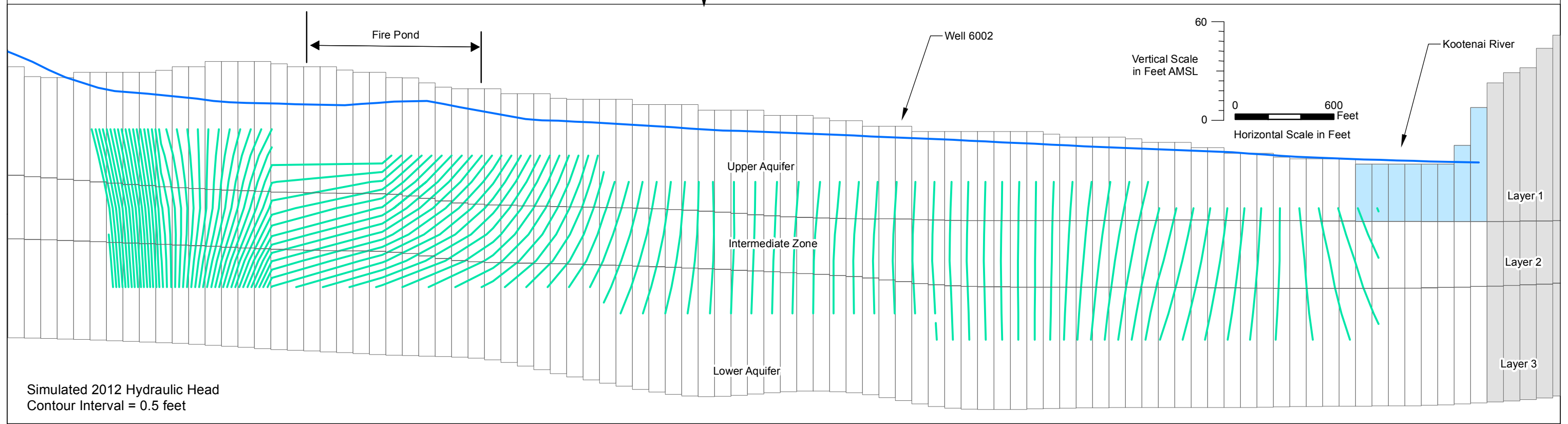
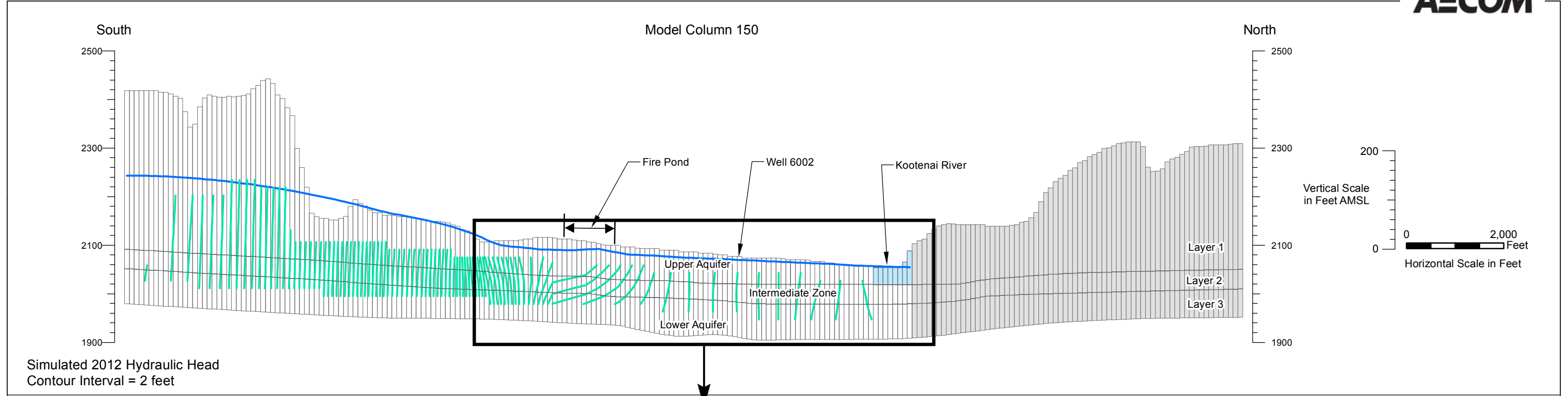
Job No.:	22243124
Designed By:	CMZ
Drawn By:	JLC
Date:	4/16/2018

FROM FIG. 5.4 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2

Fig. 2-4

Figure 2-5. Comparison of Simulated and Observed Hydraulic Heads





- Simulated 2012 Hydraulic Head
- Simulated 2012 Groundwater Table
- Grid Cell
- River Cell
- No Flow Cell

See cross-section line on Figure 5.1

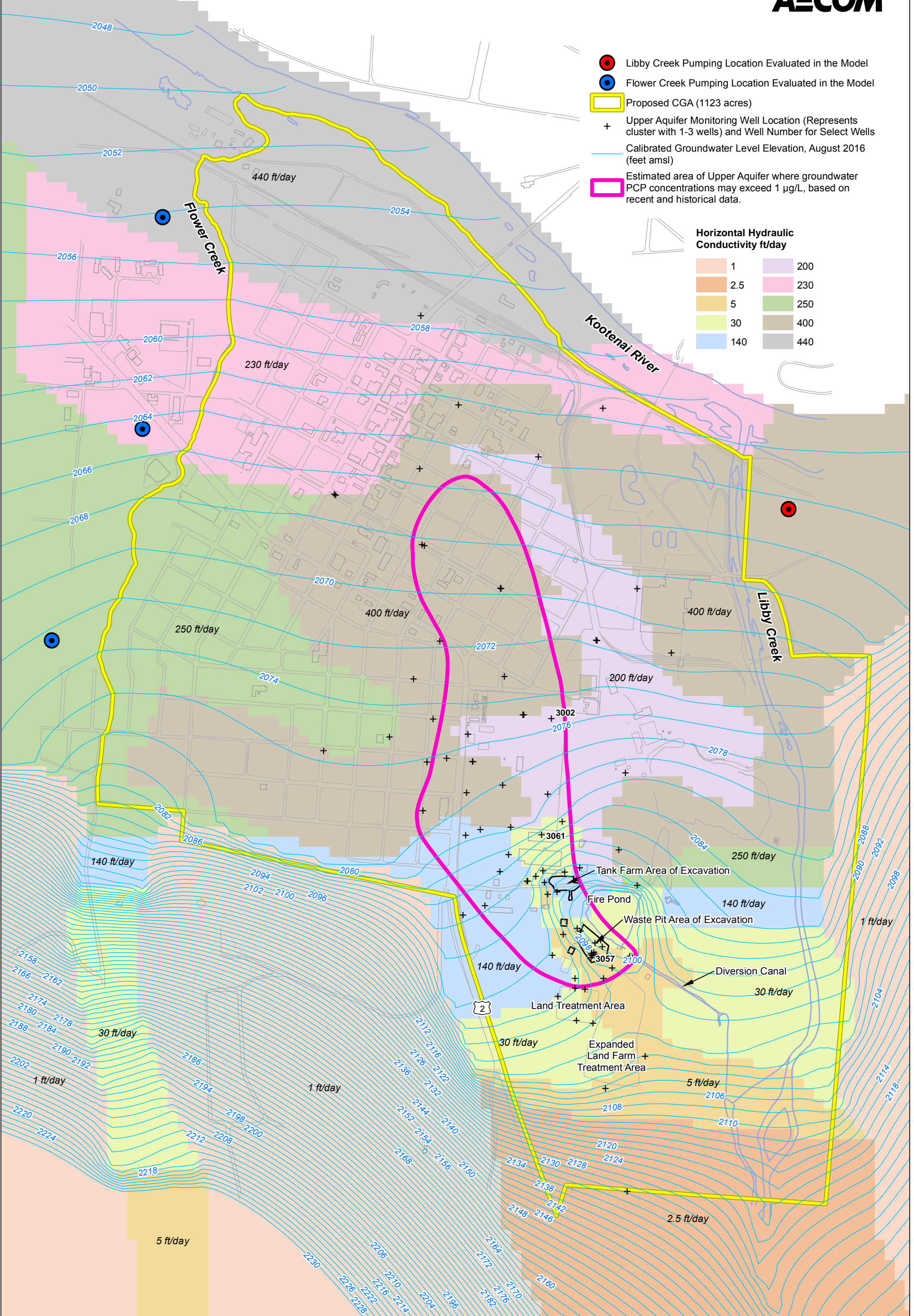
AMSL = Above Mean Sea Level
Vertical datum: NAVD 88

Job No.:	22243124
Designed By:	CMZ
Drawn By:	JLC
Date:	10/04/2016

Simulated Vertical Equipotential Lines along Cross-Section (Model Column 150)

FROM FIGURE 5.5 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2

Fig. 2-6

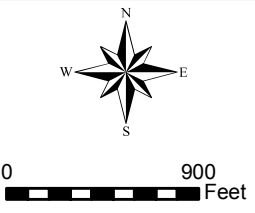


- Libby Creek Pumping Location Evaluated in the Model
- Flower Creek Pumping Location Evaluated in the Model
- Proposed CGA (1123 acres)
- + Upper Aquifer Monitoring Well Location (Represents cluster with 1-3 wells) and Well Number for Select Wells
- Calibrated Groundwater Level Elevation, August 2016 (feet amsl)
- Estimated area of Upper Aquifer where groundwater PCP concentrations may exceed 1 µg/L, based on recent and historical data.

Horizontal Hydraulic Conductivity ft/day

1	200
2.5	230
5	250
30	400
140	440

amsl = above mean sea level
Vertical datum: NAVD 88

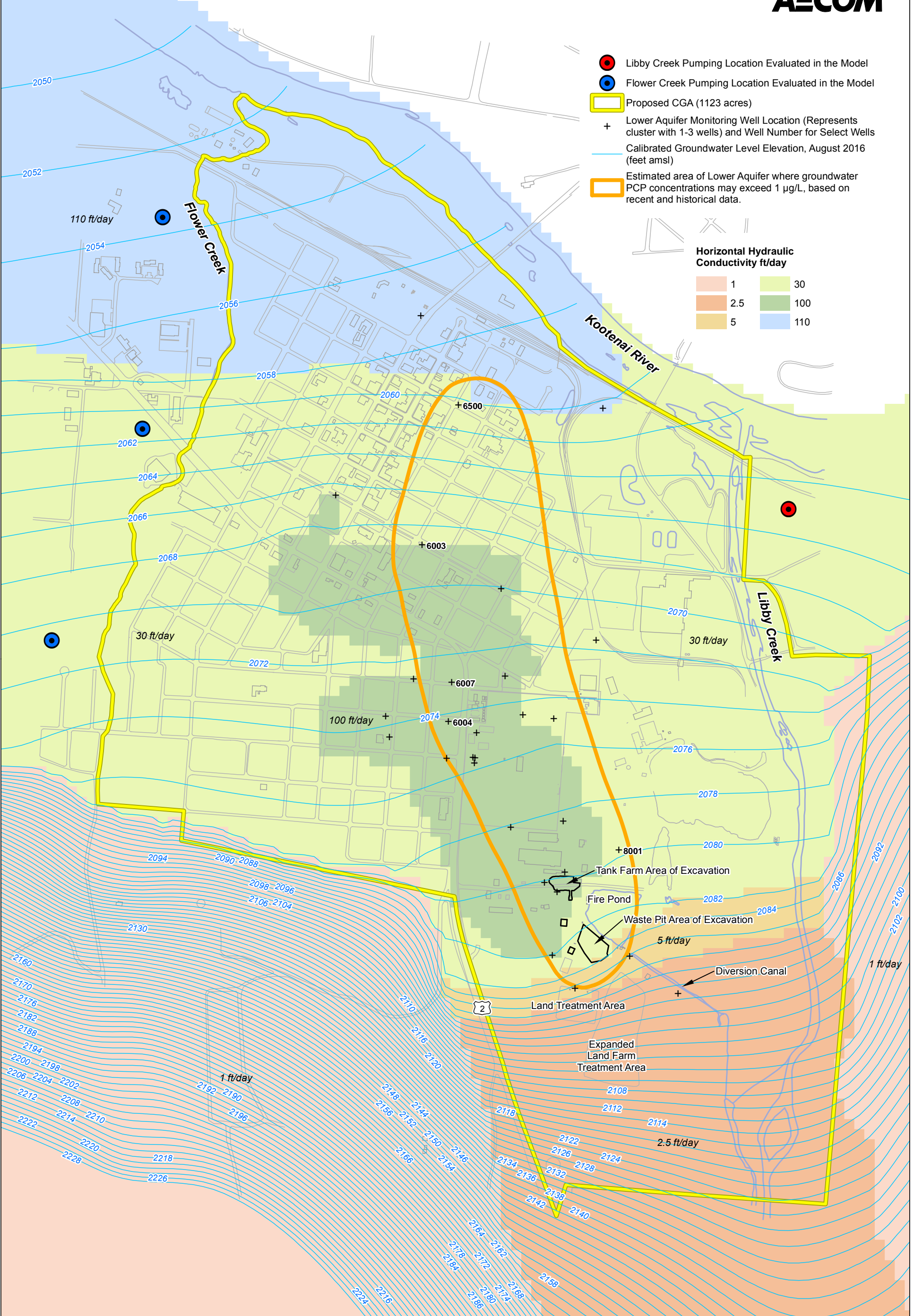


Job No.: 60542657
Designed By: MCS
Drawn By: JLC
Date: 9/26/2017

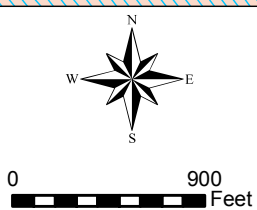
Calibrated Horizontal Hydraulic Conductivity Distribution Upper Aquifer

NUMERICAL MODELING TO EVALUATE A CONTROLLED GROUNDWATER AREA LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 2-7



amsl = above mean sea level
Vertical datum: NAVD 88

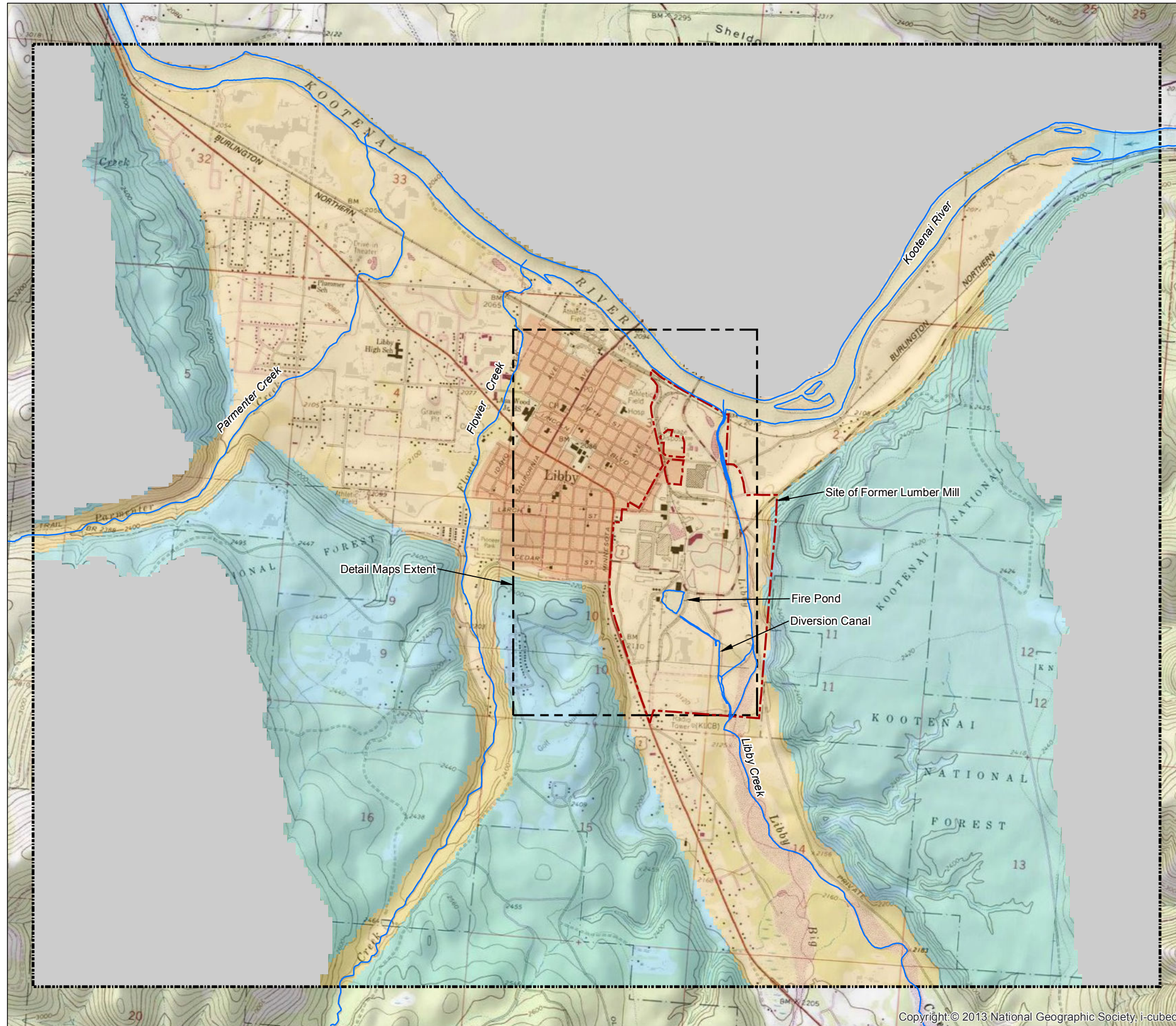


Job No.: 60542657
Designed By: MCS
Drawn By: JLC
Date: 9/26/2017

Calibrated Horizontal Hydraulic Conductivity Distribution Lower Aquifer

NUMERICAL MODELING TO EVALUATE A CONTROLLED GROUNDWATER AREA LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 2-8



Model Domain
 Historical Mill Property

Estimated Groundwater Recharge Distribution (feet/day)

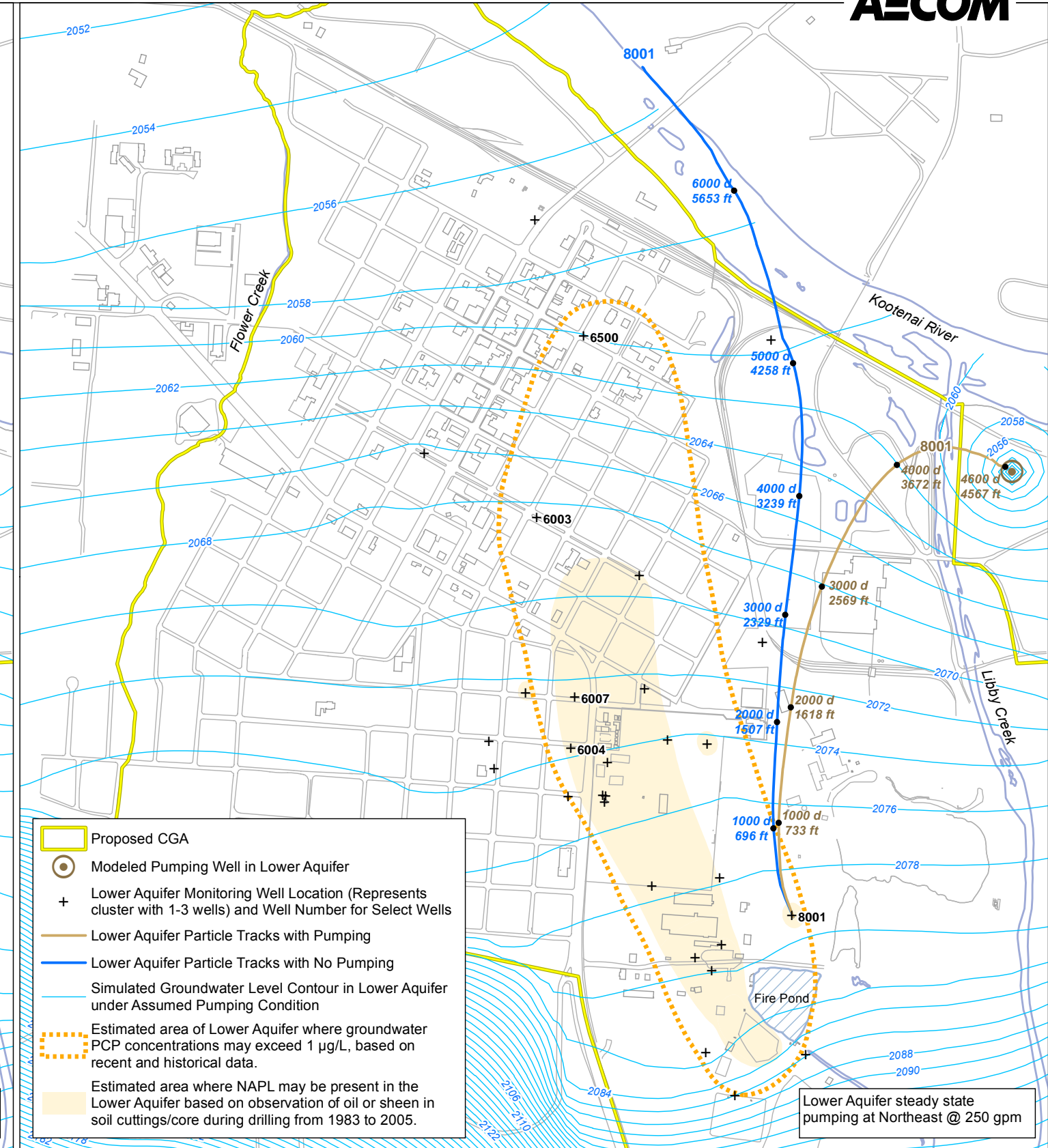
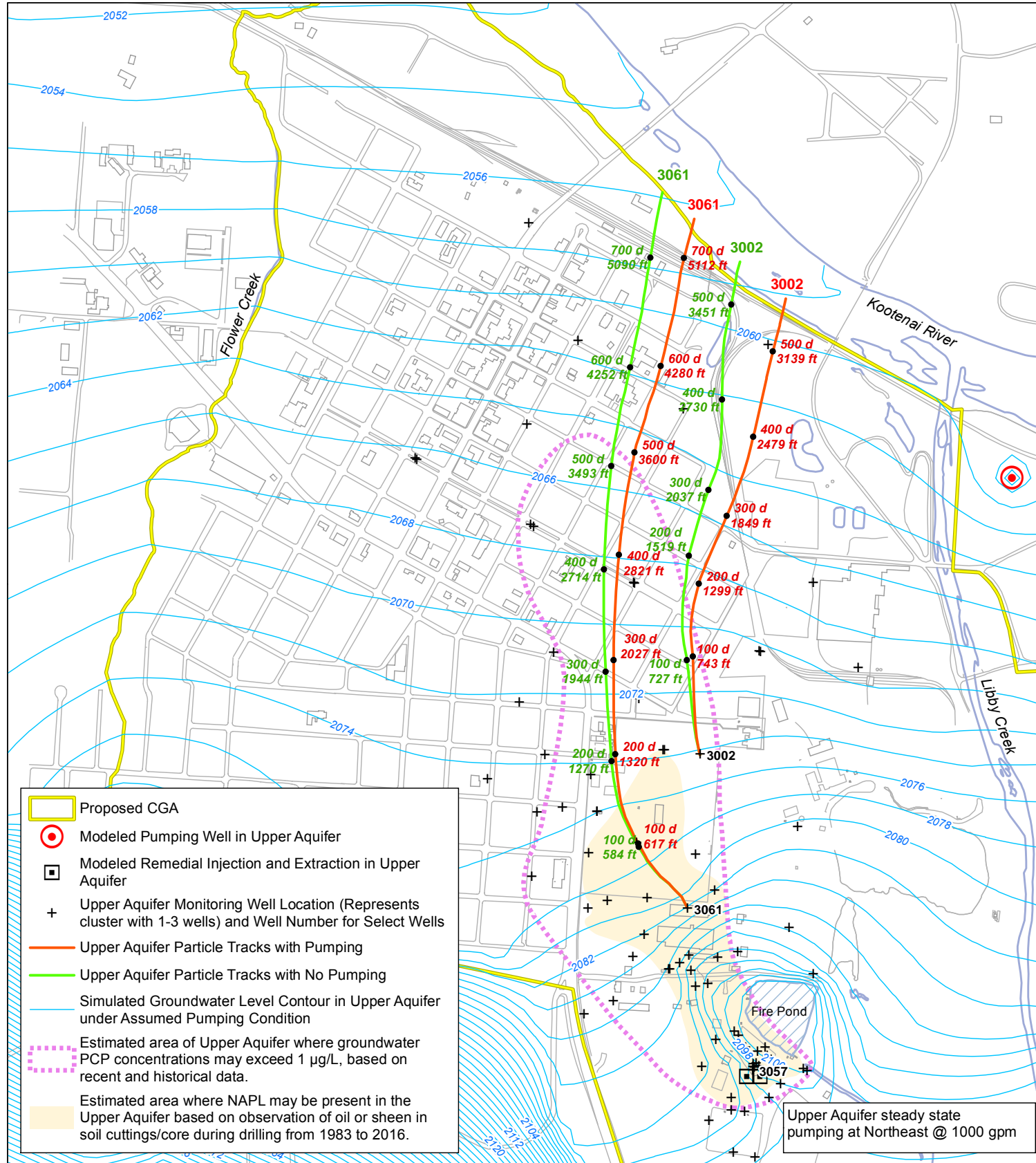
0.001140
 0.000570
 No-Flow Area

Job No.:	22243124
Designed By:	CMZ
Drawn By:	JLC
Date:	10/23/2017

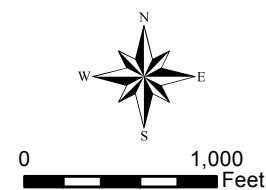
Estimated Groundwater Recharge Distribution

FROM FIGURE 5.9 OF CONCEPTUAL AND NUMERICAL GROUNDWATER FLOW AND TRANSPORT MODEL LIBBY GROUNDWATER SITE, LIBBY, MONTANA, REV. 2

Fig. 2-9



2000 d Particle Tracking Total Time (days)
 3200 ft Particle Tracking Total Distance (feet)



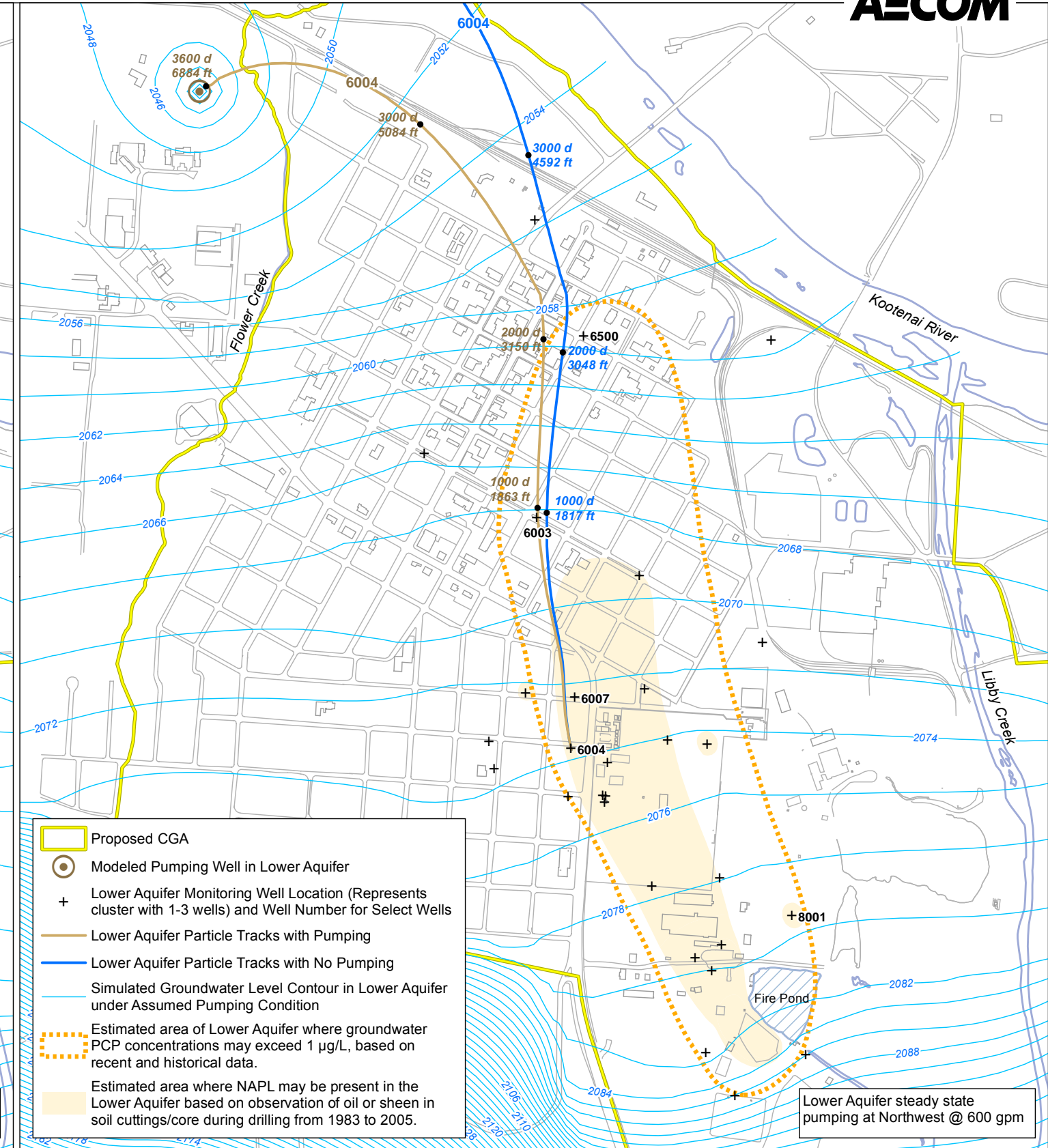
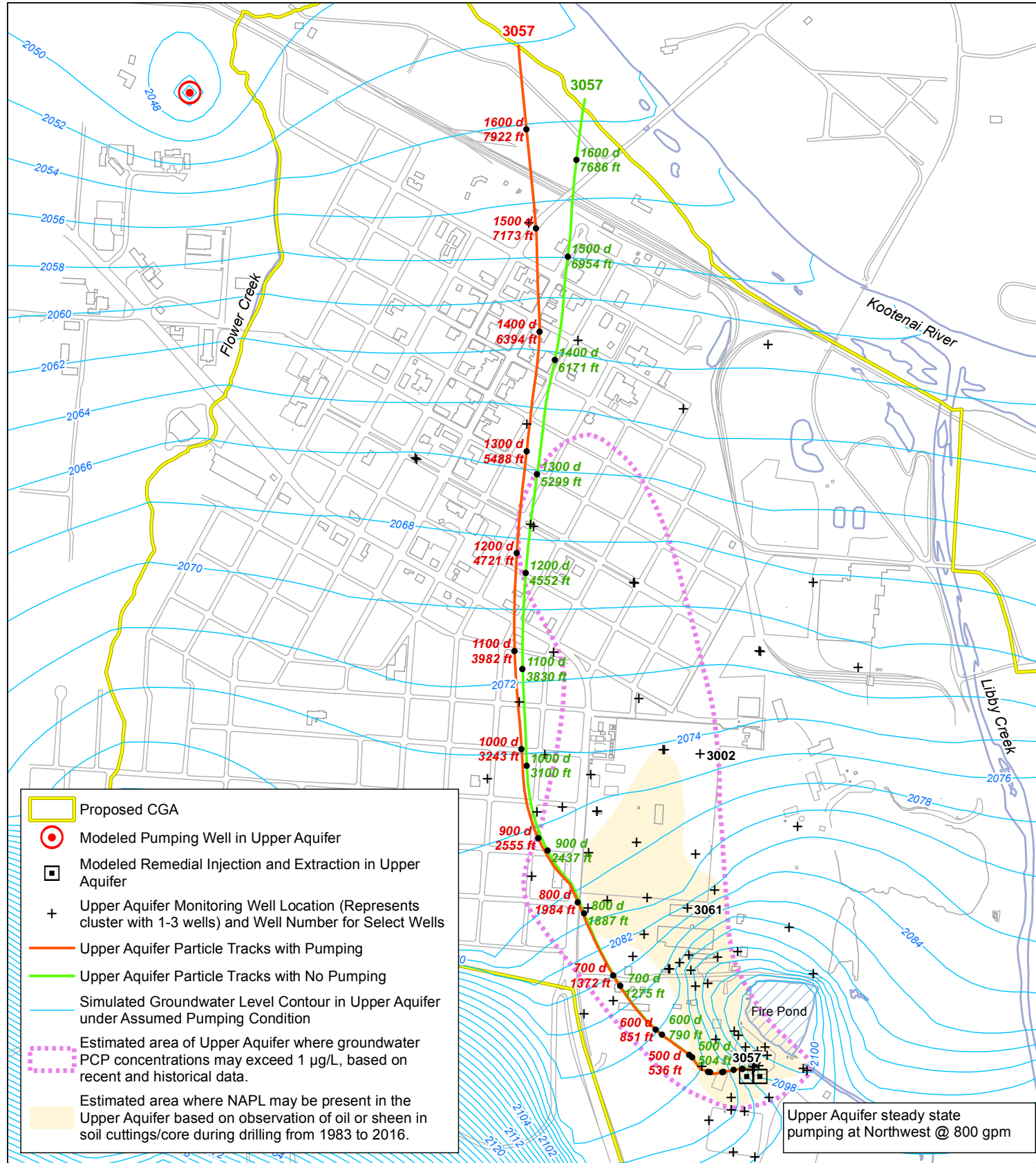
gpm = gallons per minute
 amsl = above mean sea level
 Vertical datum: NAVD 88

Job No.:	60542657
Designed By:	CMZ
Drawn By:	JLC
Date:	9/19/2017

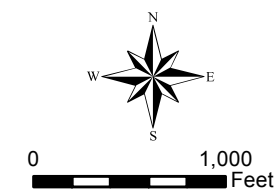
Northeast Pumping Outside the Proposed CGA Near Libby Creek

NUMERICAL MODELING
 TO EVALUATE A CONTROLLED GROUNDWATER AREA
 LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 4-1



2000 d Particle Tracking Total Time (days)
 3200 ft Particle Tracking Total Distance (feet)



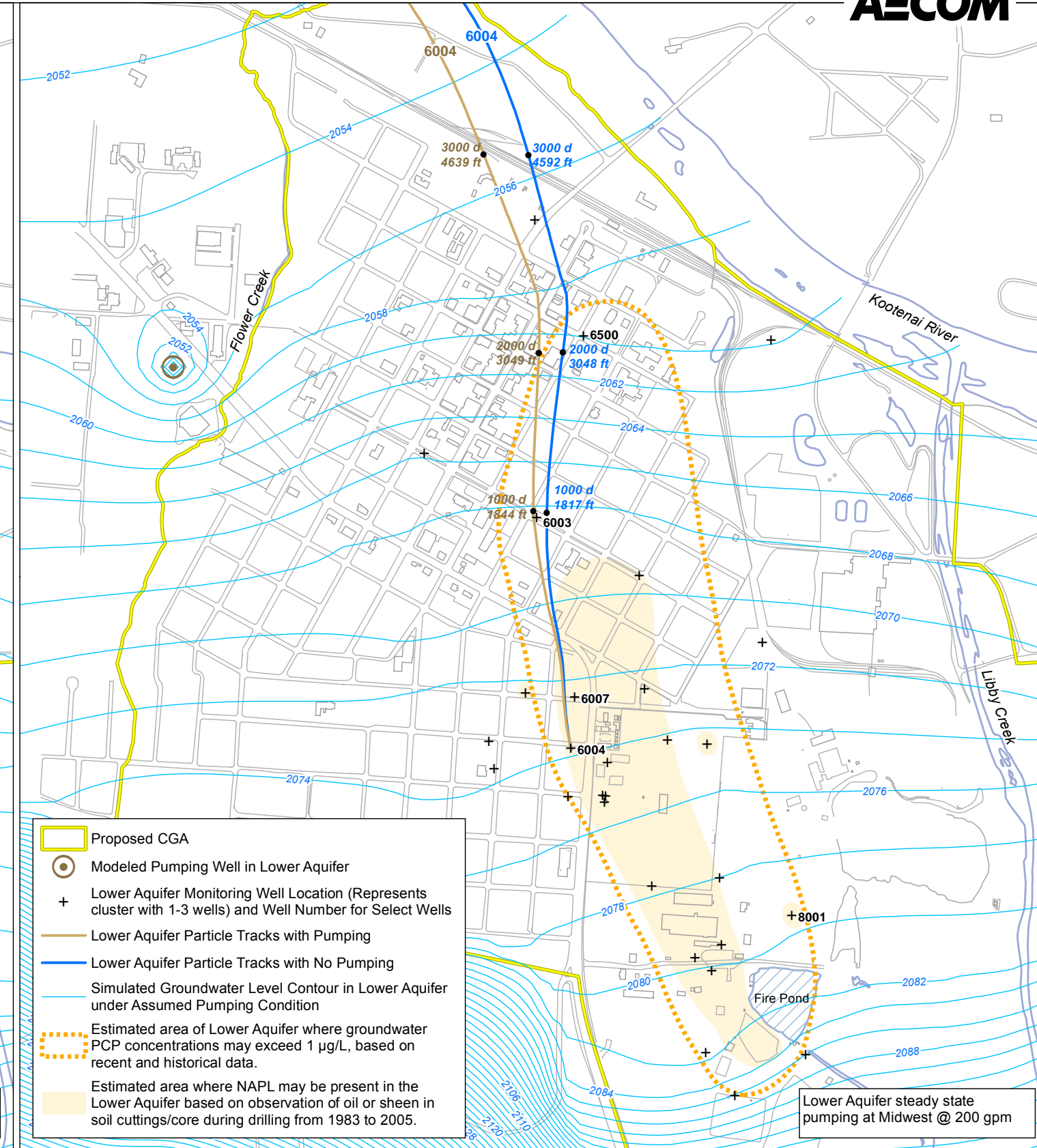
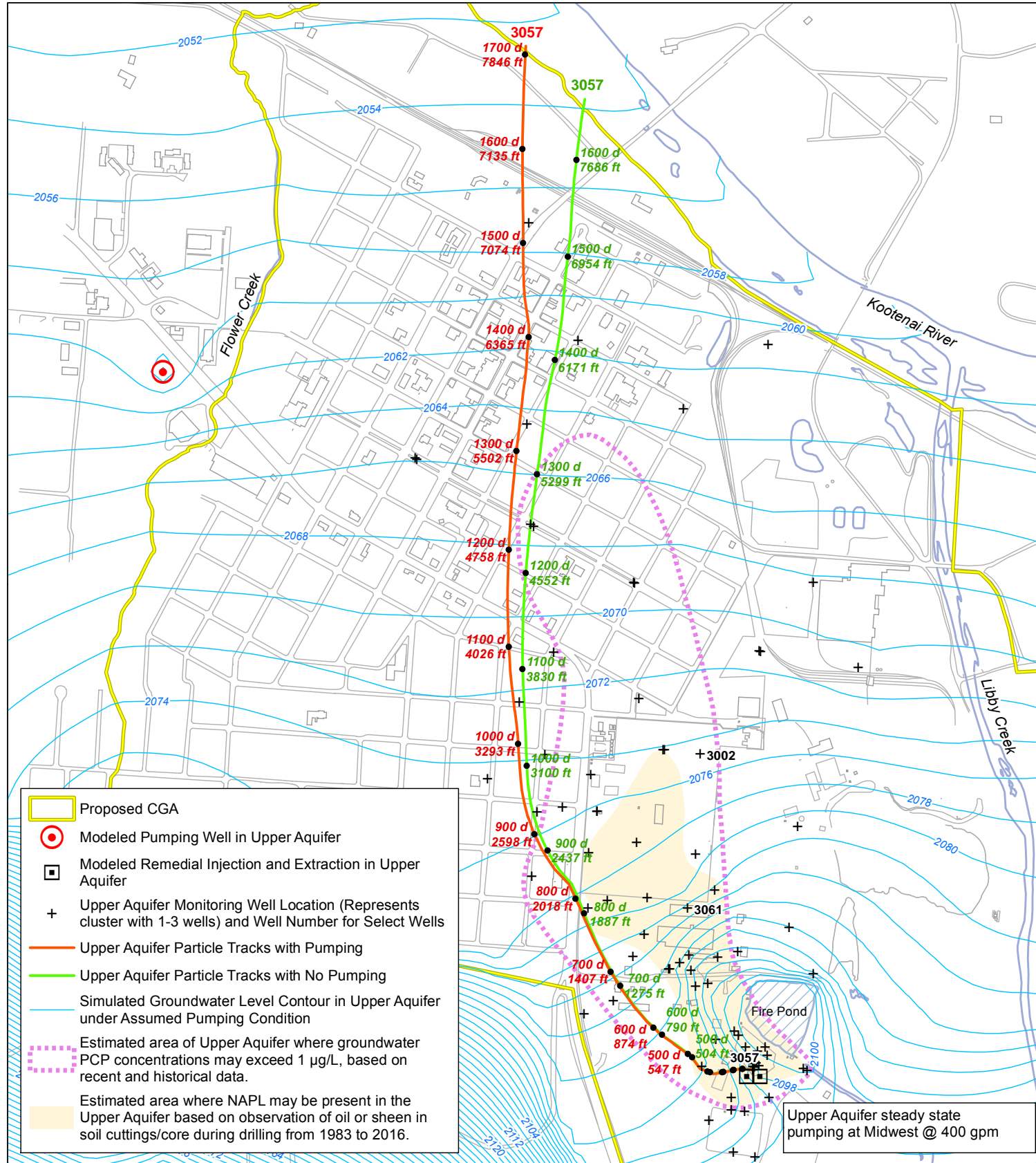
gpm = gallons per minute
 amsl = above mean sea level
 Vertical datum: NAVD 88

Job No.:	60542657
Designed By:	CMZ
Drawn By:	JLC
Date:	9/19/2017

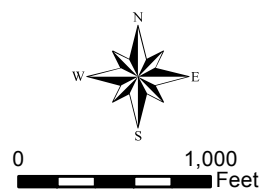
Northwest Pumping Outside the Proposed CGA Near Flower Creek

NUMERICAL MODELING
 TO EVALUATE A CONTROLLED GROUNDWATER AREA
 LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 4-2



2000 d Particle Tracking Total Time (days)
 3200 ft Particle Tracking Total Distance (feet)



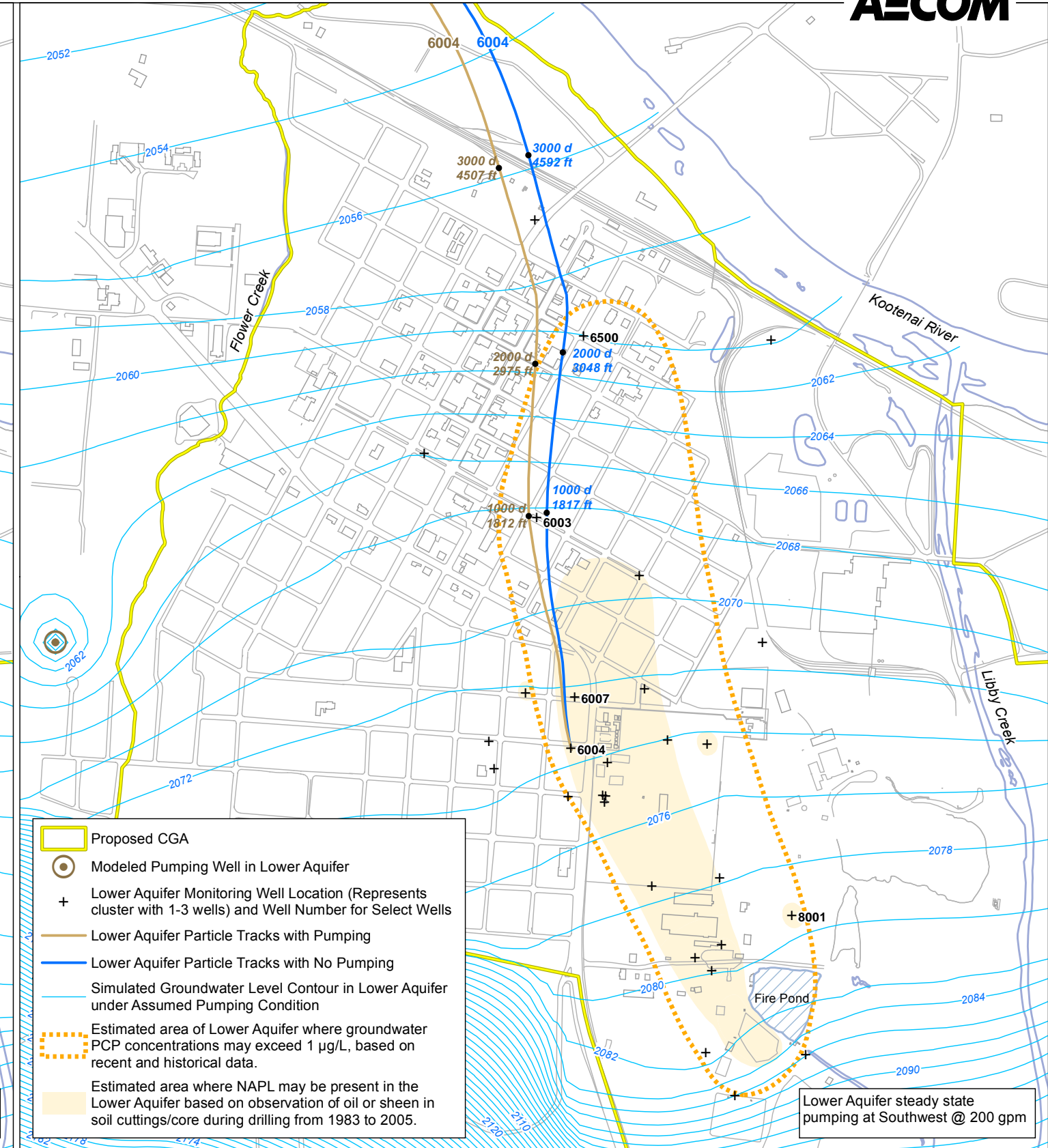
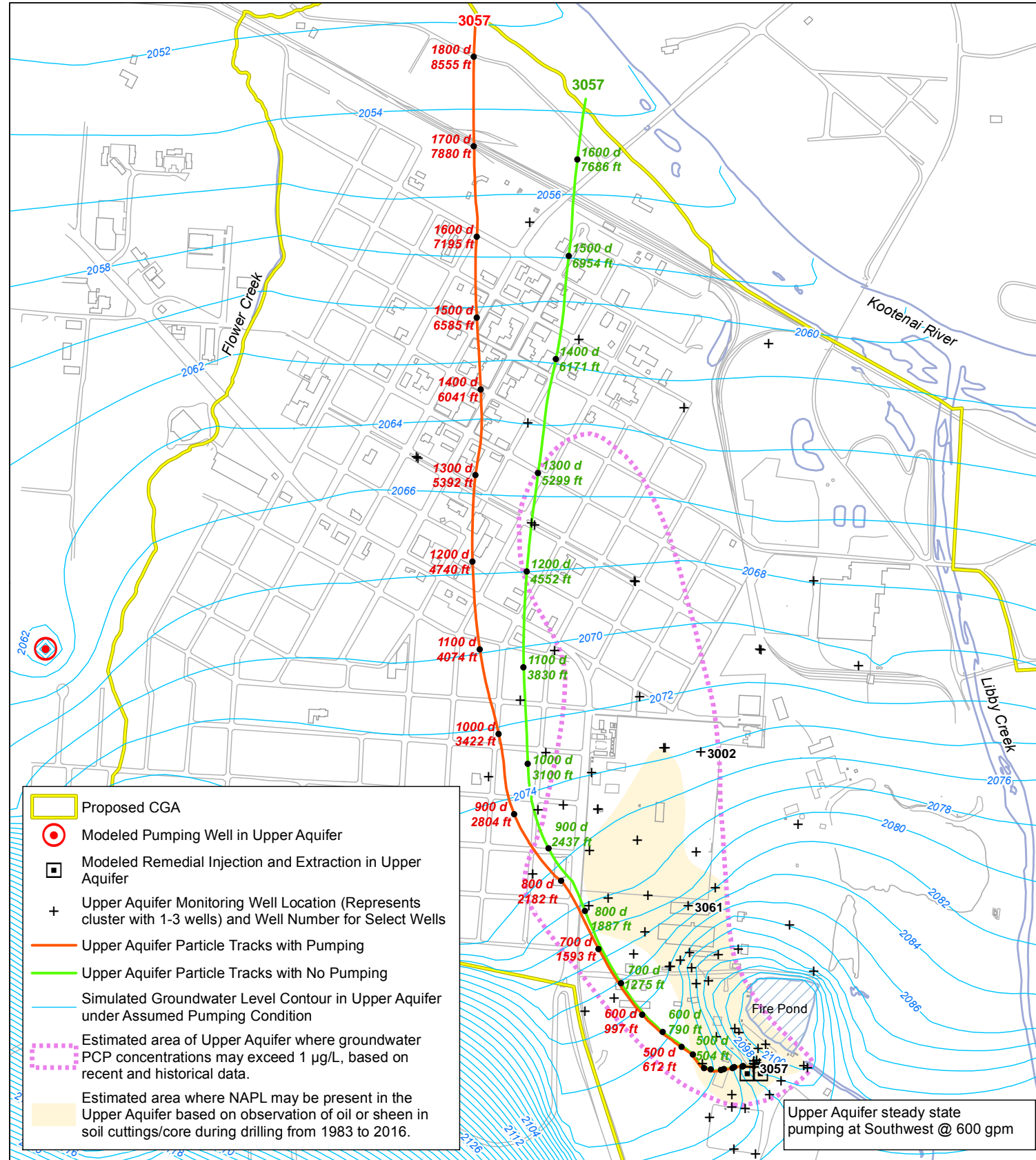
gpm = gallons per minute
 amsl = above mean sea level
 Vertical datum: NAVD 88

Job No.:	60542657
Designed By:	CMZ
Drawn By:	JLC
Date:	9/19/2017

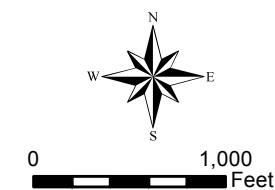
Midwest Pumping Outside the Proposed CGA Near Flower Creek

NUMERICAL MODELING
 TO EVALUATE A CONTROLLED GROUNDWATER AREA
 LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 4-3



2000 d Particle Tracking Total Time (days)
 3200 ft Particle Tracking Total Distance (feet)



gpm = gallons per minute
 amsl = above mean sea level
 Vertical datum: NAVD 88

Job No.:	60542657
Designed By:	CMZ
Drawn By:	JLC
Date:	9/19/2017

Southwest Pumping Outside the Proposed CGA Near Flower Creek

NUMERICAL MODELING
 TO EVALUATE A CONTROLLED GROUNDWATER AREA
 LIBBY GROUNDWATER SITE, LIBBY, MONTANA

Fig. 4-4

Attachment 1 Analytical Estimates of PCP Bulk Attenuation Along Groundwater Flow Paths

Attachment 1

Analytical Estimates of PCP Bulk Attenuation Along Groundwater Flow Paths

The stability of the PCP plumes downgradient of the NAPL sources in the Upper and Lower Aquifers is due to natural attenuation processes, mainly adsorption, dispersion, and natural biodegradation. The effect of adsorption on PCP transport is expressed by a retardation factor. The estimated retardation factor for PCP in the Upper and Lower Aquifers is 1.77 (Table A1-1). This means that PCP travels in the aquifers at a rate that is 1/1.77 (or 0.56) the rate of the groundwater velocity. Dissolved PCP is also dispersed (diluted) and biodegraded along its transport flow path, which further attenuates PCP transport in the aquifers. The combined effects of PCP adsorption (retardation), dispersion, and biodegradation can be estimated using a bulk attenuation half-life.

The first-order bulk attenuation half-life for dissolved PCP in the Upper and Lower Aquifers was estimated analytically using methods described in Newell et al. (2002). Groundwater concentration data from wells at various distances downgradient of the outermost extent of NAPL in the Upper and Lower Aquifers were used in the estimation. The bulk attenuation half-lives were applied to the numerical model simulated groundwater flow paths that reach pumping wells to assess whether or not PCP could potentially migrate beyond the proposed CGA due to pumping outside the CGA.

The bulk attenuation half-lives for PCP in the Upper Aquifer (shallow and middle/deep subunits) and the Lower Aquifer were estimated using solute transport parameters shown in Table A1-1. Based on these estimates, PCP attenuates the fastest in the Upper Aquifer shallow subunit (half-life of 19.7 days), followed by the Upper Aquifer middle/deep subunit (half-life of 62.5 days), and PCP attenuates the slowest in the Lower Aquifer (half-life of 217.2 days). Attenuation in the Upper and Lower Aquifers is expected to be mostly related to biodegradation because soil-water distribution coefficients for PCP are relatively low due to the low organic carbon content in the aquifer matrix, thus causing adsorption to be low.

Based on the numerical model simulations presented in the *Technical Memorandum: Numerical Modeling to Evaluate a Controlled Groundwater Area*, pumping the northeast and northwest wells outside the CGA in the Lower Aquifer has the potential to divert groundwater flow from within the NAPL-impacted source area toward the pumping wells. This is illustrated along particle flow paths from well 8001 to the northeast pumping well (Figure 4-1 of the Technical Memorandum) and from well 6004 to the northwest pumping well (Figure 4-2 of the Technical Memorandum). Table A1-2 provides a summary of the flow path distances, the range of groundwater average linear velocities along the flow paths, travel time to the pumping wells, and the distance along the flow path for PCP to attenuate to the groundwater cleanup level of 1 ug/L. Based on these estimations, PCP above the groundwater cleanup level will remain well inside the proposed CGA boundary and will not migrate to pumping wells outside the CGA.

Attachment 1 References

- Knox, R. C., D. A. Sabatini, and L. W. Canter. 1993. *Subsurface Transport and Fate Processes*, Lewis Publishers, 430 pages.
- Newell, C. J., H. S. Rifai, J. T. Wilson, J. A. Connor, J. A. Aziz, and M. P. Suarez. 2002. *Calculation and Use of First-Order Rate Constants for Monitored Natural Attenuation Studies*. EPA Groundwater Issue. November.
- URS. 2012. *Report: Investigation to Further Characterize the Upper Aquifer in the Former Source Areas, Libby Groundwater Site, Libby, Montana, Revision 1*. Prepared for International Paper Company. May 14.
- URS. 2016. *Conceptual and Numerical Groundwater Flow and Transport Model, Libby Groundwater Site, Libby Montana, Revision 2*. Prepared for International Paper Company. October 4.

Attachment 1

Table A1-1. Solute Transport Parameter Values for the Upper and Lower Aquifers

Parameter	Aquifer	Value	Unit	Notes
Bulk mass density of porous media (ρ_b)	Upper and Lower	1.89	g/cm ³	Upper Aquifer soil samples collected from former waste pit and tank farm (URS 2012); assumed that values are similar in the Lower Aquifer
Total porosity (n)	Upper and Lower	0.307	unitless	Upper Aquifer soil samples collected from former waste pit and tank farm (URS 2012); assumed that values are similar in the Lower Aquifer
Effective porosity (n_e)	Upper	0.2	unitless	Numerical model calibrated value (URS 2016)
	Lower	0.15	unitless	Numerical model calibrated value (URS 2016)
Distribution coefficient (K_d)	Upper and Lower	0.125	L/kg or mL/g	$K_d = K_{oc} * f_{oc}$
Retardation factor (R)	Upper and Lower	1.77	unitless	$R = 1 + (\rho_b/n) * K_d$
Fraction organic carbon (f_{oc})	Upper and Lower	1.4E-04	g/g	Geomean of total organic carbon (140 mg/kg) for various saturated soil samples collected from mid 1980's to early 1990's collected from Upper and Lower Aquifers (lower bound for soil organic carbon)
Organic carbon partition coefficient (K_{oc})	Upper and Lower	891	L/kg	Literature value from Knox et. al. (1993)
Bulk attenuation half-life ($t_{1/2}$)	Upper - shallow	19.7	days	Estimated using method in Newell et. al. (2002), assuming first order decay of 2016 PCP concentrations at wells 3003.2 (140 µg/L), 3008.1 (3.9 µg/L), 3062.1 (3 µg/L), and 3010.1 (<0.5 µg/L)
	Upper - middle/deep	62.5	days	Estimated using method in Newell et. al. (2002), assuming first order decay of 2016 PCP concentrations at wells 3061.3 (1,300 µg/L), 3002.2 (110 µg/L), 6014.3 (1.5 µg/L), and 6019.3 (<0.5 µg/L)
	Lower	217.2	days	Estimated using method in Newell et. al. (2002), assuming first order decay of 2016 PCP concentrations at wells 6007.1 (390 µg/L), 6003.3 (170 µg/L), and 6500.3 (<0.5 µg/L)

Notes:

g/cm³ = grams per cubic centimeters

g/g = grams per gram

L/kg = liters per kilogram

mg/kg = milligrams per kilogram

mL/g = milliliter per gram

PCP = pentachlorophenol

µg/L = micrograms per liter

The well cluster locations of are shown on Figure 3 of the CGA Petition Supporting Information

Attachment 1

Table A1-2. Travel Time and Distances for Particle Flow in the Lower Aquifer to Simulated Wells

Model Simulated Flowpath		Distance Along Particle Flowpath (ft)	Average Linear Velocity Range Along Flow Path (ft/d) ^a	Travel Time to Pumping Wells (yrs)		Assumed PCP Concentration at Monitoring Well (µg/L) ^b	Distance Along Flow Path for PCP to Attenuate to 1 µg/L (ft) ^c
From Monitoring Well	To Pumping Well			Water Particle	PCP Solute Particle		
8001	NE	4,600	0.7 - 1	12.6	22.3	1,000	1,800
6004	NW	6,900	1 - 2	9.9	17.5	1,000	3,400
Attenuation Applied to Particle Travel Along Flowpaths		none		none	adsorption		adsorption, dispersion, and biodegradation (bulk attenuation)

Notes:

^a The average linear velocity range for Lower Aquifer flow paths from wells 8001 and 6004 is the range of average velocities estimated between the 1,000 day time steps in the model (see Appendix A Technical Memorandum Figures 4-1 and 4-2).

^b Wells 8001 and 6004 are not routinely sampled. NAPL was detected in the Lower Aquifer during drilling at these locations. The PCP concentration at these well locations is conservatively assumed to be 1,000 ug/L, the estimated effective solubility of PCP in groundwater at Libby.

^c It takes an estimated 10 half-lives (2,172 days or 6 years) to reduce dissolved PCP in the Lower Aquifer from 1,000 ug/L to the groundwater cleanup level of 1 ug/L. The distance along the flowpath for PCP to attenuate to 1 ug/L was estimated by measuring the flow path distance to the 2,000 day time step, then estimating the distance to travel an additional 172 days using the average linear velocity near 2,000 days.

ft = feet

ft/d = feet per day

NAPL = non-aqueous phase liquid

PCP = pentachlorophenol

µg/L = micrograms per liter

Appendix B. Qualifications of Staff Preparing the CGA Petition

APPENDIX B

QUALIFICATIONS OF STAFF PREPARING THE CGA PETITION

Ms. Mary Stauffer was the key author of the document: *Controlled Groundwater Area Supporting Information, Libby Groundwater Site, Libby, Montana, April 2018*. Ms. Stauffer has a B.S. degree in geology from the University of South Carolina and a M.S. degree in geology from Wright State University, with coursework in quantitative hydrogeology; geochemistry; groundwater flow, transport, and geochemical modeling; and groundwater law. Her master's thesis was a study of the geochemical evolution of groundwater migrating downgradient of a solid waste landfill. Ms. Stauffer has worked as a hydrogeologist in the environmental consulting business for 26 years. She has provided hydrogeology technical support on the Libby Groundwater Site project since 1990, including several of the subsurface investigations.

Drs. Chuan-Mian Zhang and Xiaoni Guo performed the groundwater modeling to support the CGA Petition.

Dr. Zhang has a B.S. degree in hydrology from Hohai University, China, a M.S. degree in Civil Engineering, water resources, and a PhD degree in Civil Engineering, water resources from Colorado State University. Dr. Zhang has 28 years of experience in groundwater modeling. She has been working on a wide range of groundwater models to support characterization of site hydrogeological conditions, investigation of groundwater contamination, evaluation of LNAPL/DNAPL/radionuclear conditions, development of remedial alternatives, and optimal design of pump-and-treat systems. She has developed groundwater flow and transport models under complex hydrogeological conditions, in AZ, CA, CO, NE, NM, NV, NY, ME, OH, OR, TN, WA, WY, and West Australia.

Dr. Guo has a B.S. degree in Hydrology from Hohai University, China, a M.S. degree in Civil Engineering water resources, and a PhD degree in Civil Engineering, water resources from Colorado State University. Dr. Guo has 27 years of experience in groundwater modeling. He has a strong background in mathematics, numerical modeling, optimization techniques, statistical analysis, numerical computational methods, computer programming and software development. He developed several innovative methodologies and computer software in groundwater modeling and optimization, including (1) a practical automated procedure and a computer code MODAC[®] for groundwater model calibration and (2) a new optimization approach based on economic concept, the Successive Equimarginal Approach (SEA), for optimal design of groundwater pump and treat system.

Appendix C. List of Landowners Inside Proposed CGA

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417502302100000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417502302110000	LINCOLN COUNTY	PO BOX 396		LIBBY	MT	59923-0396
56417503201010000	NEWMAN LARRY R & JOANNE L	302 CITY SERVICE RD		LIBBY	MT	59923-3067
56417503201020000	PILNY FAMILY TRUST &	400 CITY SERVICE RD		LIBBY	MT	59923-3068
56417503201030000	TAPIA CHARLES	412 PIONEER RD		LIBBY	MT	59923-2921
56417503202010000	KLAG JOHN & CAROL	274 N COLORADO AVE		LIBBY	MT	59923-3018
56417503202020000	REMP ANDREW M &	236 N COLORADO AVE		LIBBY	MT	59923-3018
56417503202030000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202040000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202050000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202060000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202070000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202080000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMP	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56417503202090000	HOFF JEFFREY A &	168 BALD EAGLE RD		LIBBY	MT	59923-9438
56417503202100000	RAY MICHAEL D & RAY CAROL S TTEES	245 FAIRWAY OAKS DR		SEDONA	AZ	86351-8829
56417503202110000	MONTANASKY WEST LLC	1286 BURNS WAY		KALISPELL	MT	59901-3165
56417503203090000	WOOD MARK F & R NEIL & MARY E &	303 CITY SERVICE RD		LIBBY	MT	59923-3075
56417503203110000	WOOD MARK F & R NEIL & MARY E &	303 CITY SERVICE RD		LIBBY	MT	59923-3075
56417503203120000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503203150000	STATE OF MONTANA	2701 PROSPECT AVE		HELENA	MT	59601-9746
56417503204010000	STATE OF MONTANA	2701 PROSPECT AVE		HELENA	MT	59601-9746
56417503204020000	PETERSON KANDIS D	PO BOX 1097		LIBBY	MT	59923-1097
56417503204030000	BACKEN MARINE SERVICES LLC	36510 US HIGHWAY 2		LIBBY	MT	59923-8337
56417503204040000	WHITE IRLE E & MARGARET P WILSON	473 W THOMAS ST		LIBBY	MT	59923-8810
56417503204050000	WHITE IRLE E & MARGARET P WILSON	473 W THOMAS ST		LIBBY	MT	59923-8810
56417503204060000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503204070000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503204080000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503205010000	MCNULTY JAMES H	658 W 2ND ST		LIBBY	MT	59923-1623
56417503205020000	PHOENIX GARY L	616 MAIN AVE		LIBBY	MT	59923-1814
56417503205030000	KERR JAMES R & LOUISE MAUREEN TTEES	465 CORTE SUR		NOVATO	CA	94949-5957
56417503205040000	DRAKE TARA LEIGH	PO BOX 438		LIBBY	MT	59923-0438
56417503205050000	POWERS RONALD D & JESSICA LYNN FACCHIN-	PO BOX 500		LIBBY	MT	59923-0500
56417503205070000	NOBLE MICHAEL & PATRICIA	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503205080000	CARLOCK JOHN E & TINA K	PO BOX 1218		LIBBY	MT	59923-1218
56417503205090000	BROADWAY REBEKAH	617 W 1ST ST		LIBBY	MT	59923-1622
56417503206010000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503206020000	VINSON RICHARD E & KAY L	701 W 1ST ST		LIBBY	MT	59923-1638
56417503206030000	ADKISON ROBERT L	35143 US HIGHWAY 2		LIBBY	MT	59923-8478
56417503206040000	EMERY ALBERT CLARK & DARLENE	612 W 1ST ST		LIBBY	MT	59923-1621
56417503206050000	MARTIN ELAINE D	4510 ANCHOR MILL RD		PAPILLION	NE	68133-2705
56417503206060000	PASTERKAMP DAVID J TTEE	520 W 1ST ST		LIBBY	MT	59923-1619
56417503206070000	CLEMONS ROBERT L &	518 W 1ST ST		LIBBY	MT	59923-1619
56417503206080000	PICKERING DAVID JAMES	516 W 1ST ST		LIBBY	MT	59923-1619
56417503206090000	KATZER BRITTANY E	514 W 1ST ST		LIBBY	MT	59923-1619
56417503206100000	DUNNING DIANNE MCCORMACK	48 PIPE CREEK HILL RD		LIBBY	MT	59923-9744
56417503206110000	HUNTSBERGER GARY & MARY KAY	PO BOX 647		LIBBY	MT	59923-0647
56417503206120000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503207010000	GARZA MARIA DEL JESUS	110 NEVADA AVE		LIBBY	MT	59923-1715
56417503207020000	CROWELL TRACI L	PO BOX 1170		LIBBY	MT	59923-1170
56417503207030000	HOLM JENNIFER LYNN	517 W 1ST ST		LIBBY	MT	59923-1700
56417503207040000	HOPFINGER JUSTIN & SHANNON	519 W 1ST ST		LIBBY	MT	59923-1700
56417503207050000	VANDERVOORDEN ROBERT GEORGE	522 W 2ND ST		LIBBY	MT	59923-1612
56417503207060000	MOELLER BILLIE S & NORMA LYNN	516 W 2ND ST		LIBBY	MT	59923-1612

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503207070000	NELSON JAKE	506 W 2ND ST		LIBBY	MT	59923-1612
56417503207080000	HUISENTRUIT JEREMY J	504 W 2ND ST		LIBBY	MT	59923-1612
56417503208010000	VIAL FUNERAL HOME	MAIL TO SCHNACKENBERG & NELSON FUNERAL HOME	PO BOX 750	LIBBY	MT	59923-0750
56417503208020000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503208030000	SCHNACKENBERG STEVEN & DENISE	PO BOX 750		LIBBY	MT	59923-0750
56417503209010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503209020000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503211010000	STATE OF MONTANA	2701 PROSPECT AVE		HELENA	MT	59601-9726
56417503211020000	HARPER ERDMAN POST 1548	114 W 2ND ST		LIBBY	MT	59923-1960
56417503211030000	HARPER ERDMAN POST 1548	114 W 2ND ST		LIBBY	MT	59923-1960
56417503211040000	HARPER ERDMAN POST 1548	114 W 2ND ST		LIBBY	MT	59923-1960
56417503211050000	MINT BAR OF LIBBY II INC	110 MINERAL AVE		LIBBY	MT	59923-1950
56417503211060000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503211070000	MINT BAR OF LIBBY II INC	110 MINERAL AVE		LIBBY	MT	59923-1950
56417503211080000	MINT BAR OF LIBBY II INC	110 MINERAL AVE		LIBBY	MT	59923-1950
56417503211090000	STATE OF MONTANA	2701 PROSPECT AVE		HELENA	MT	59601-9726
56417503211100000	OELBERG TRENTON P & PEGGY M	133 LAKE HOLLOW RD		PINEY FLATS	TN	37686-3232
56417503212010000	KEMP WALTER H	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503212020000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503212030000	PROPANE COMPANY THE	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503212040000	HOLLINGSWORTH LAND NO 1	PO BOX 820		LIBBY	MT	59923-0820
56417503212050000	HOLLINGSWORTH LAND NO 1	PO BOX 820		LIBBY	MT	59923-0820
56417503212060000	AMERITECH ROOFING SYSTEMS DBA	PO BOX 907		LIBBY	MT	59923-0907
56417503213010000	BERGET TODD	45 PLUMMER RD		LIBBY	MT	59923-3219
56417503213020000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503213030000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503213040000	SENIOR CITIZENS OF LINCOLN COUNTY	206 E 2ND ST		LIBBY	MT	59923-2048
56417503213060000	SENIOR CITIZENS OF LINCOLN COUNTY	206 E 2ND ST		LIBBY	MT	59923-2048
56417503213070000	SENIOR CITIZENS OF LINCOLN COUNTY	206 E 2ND ST		LIBBY	MT	59923-2048
56417503213090000	SENIOR CITIZENS OF LINCOLN COUNTY	206 E 2ND ST		LIBBY	MT	59923-2048
56417503214010000	SIMPSON ERIC	219 E 2ND ST		LIBBY	MT	59923-2047
56417503214020000	LIBBY CLINIC BUILDING PARTNERSHIP OF	1020 IDAHO AVE		LIBBY	MT	59923-1712
56417503214030000	FUCHS SALLY E & MICHAEL J	12115 MERIDIAN AVE S APT C126		EVERETT	WA	98208-5737
56417503214040000	NELSON ELIZABETH E	209 MONTANA AVE		LIBBY	MT	59923-2035
56417503214050000	CENTER FOR ASBESTOS RELATED DISEASE	214 E 3RD ST		LIBBY	MT	59923-2056
56417503214060000	CENTER FOR ASBESTOS RELATED DISEASE	214 E 3RD ST		LIBBY	MT	59923-2056
56417503214070000	CENTER FOR ASBESTOS RELATED DISEASE INC	214 E 3RD ST		LIBBY	MT	59923-2056
56417503215010000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503215020000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503215030000	BUTI RICHARD E & PAUL J	115 E 2ND ST		LIBBY	MT	59923-2045
56417503215040000	STOKESBERRY WILLIAM A & DEBORAH K	203 MINERAL AVE		LIBBY	MT	59923-1951
56417503215050000	EJELSTAD GARY D & DEVENY	PO BOX 186		LIBBY	MT	59923-0186
56417503215060000	CHRISTIANSSEN JOAN	760 HAMOAKA DR		TROY	MT	59935-9681
56417503215070000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503215080000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503215090000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503215100000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503216010000	HANSON BARBARA M	PO BOX 7296		KALISPELL	MT	59904-0296
56417503216030000	DOUBEK SANDRA L &	44 OPAL DR		LIBBY	MT	59923-8343
56417503216040000	SWAGGER WILLIAM VINCENT JR & MICHELLE L	88 TERRACE VIEW RD		LIBBY	MT	59923-7623
56417503216060000	SORENSEN STEVEN	422 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503216070000	SORENSEN STEVEN L	422 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503216100000	POSTLETHWAITE TONY	109 W 2ND ST		LIBBY	MT	59923-1959
56417503216110000	UTHOF ROBERT J & LINDA D	31978 US HIGHWAY 2		LIBBY	MT	59923-3026

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503216120000	UITHOF ROBERT J & LINDA D	31978 US HIGHWAY 2		LIBBY	MT	59923-3026
56417503216130000	UITHOF ROBERT J & LINDA D	31978 US HIGHWAY 2		LIBBY	MT	59923-3026
56417503216140000	STATE OF MONTANA DEPT OF HIGHWAYS	2701 PROSPECT AVE		HELENA	MT	59601-9746
56417503216150000	CENTER FOR ASBESTOS RELATED DISEASE INC	6814 MT HIGHWAY 37		LIBBY	MT	59923-9344
56417503217010000	THORNTON DONALD E	PO BOX 604		LIBBY	MT	59923-0604
56417503217030000	THORNTON DONALD E	PO BOX 604		LIBBY	MT	59923-0604
56417503217040000	DAVIDSON STEVE P C	200 CALIFORNIA AVE		LIBBY	MT	59923-1936
56417503217050000	MONTGOMERY CHRISTIAN & AMANDA	209 W 2ND ST		LIBBY	MT	59923-1851
56417503217060000	MONTGOMERY CHRISTIAN & AMANDA	209 W 2ND ST		LIBBY	MT	59923-1851
56417503217070000	GILL GARY L AND PAULA C	215 MAIN AVE		LIBBY	MT	59923-1843
56417503218010000	PARK APARTMENTS LLC (THE)	2437 GLEN LAKE RD		EUREKA	MT	59917-9630
56417503218020000	PARK APARTMENTS LLC (THE)	2437 GLEN LAKE RD		EUREKA	MT	59917-9630
56417503218030000	PARK APARTMENTS LLC (THE)	2437 GLEN LAKE RD		EUREKA	MT	59917-9630
56417503218040000	HUNTSBERGER GARY R & MARY K	PO BOX 647		LIBBY	MT	59923-0647
56417503218050000	PARK APARTMENTS LLC (THE)	2437 GLEN LAKE RD		EUREKA	MT	59917-9630
56417503218060000	ERICKSON JOSHUA J & ELISABETH M	219 IDAHO AVE		LIBBY	MT	59923-1733
56417503219010000	ANDERSEN CAROL ANN	259 TREASURE VIEW DR		LIBBY	MT	59923-8326
56417503219020000	ANDERSEN CAROL ANN	259 TREASURE VIEW DR		LIBBY	MT	59923-8326
56417503219030000	HEYNEMAN CHARLES M & VALERIA L	3238 DURLAND DR		BILLINGS	MT	59102-0443
56417503219040000	NORRIS RUTH M &	407 W 2ND ST		LIBBY	MT	59923-1749
56417503219050000	FIFIELD OWEN L	415 W 2ND ST		LIBBY	MT	59923-1749
56417503219060000	ALEXANDER JAMES H	MAIL TO CYNTHIA MARCOUILLER	9983 N MYRTLE RD	MYRTLE CREEK	OR	97457-9639
56417503219070000	HUNTSBERGER JOLENE	211 NEVADA AVE		LIBBY	MT	59923-1741
56417503219080000	ETIENNE TIMOTHY JOHN	412 W 3RD ST		LIBBY	MT	59923-1754
56417503220010000	LEE MICHAEL D &	34580 US HIGHWAY 2		LIBBY	MT	59923-8432
56417503220020000	WOOD PHILLIP L & MARY P TRUSTEES	5934 N SAGUARO HILLS PL		MERIDIAN	ID	83646-5719
56417503220030000	HUISENTRUIT DEBBIE	4274 IRON CREEK RD		TROY	MT	59935-9322
56417503220040000	MCNULTY ROGER A	507 W 2ND ST		LIBBY	MT	59923-1611
56417503220060000	SCHULTE TIMBER L & SOMMER R	521 W 2ND ST		LIBBY	MT	59923-1611
56417503220070000	DUTTON MERRITT R & GLORIA E	213 COLORADO AVE		LIBBY	MT	59923-1601
56417503220080000	MANCUSO KENNETH D & BEATRICE M	PO BOX 1014		LIBBY	MT	59923-1014
56417503220090000	LEE MICHAEL D &	34580 US HIGHWAY 2		LIBBY	MT	59923-8432
56417503221010000	MILLER WILLIAM M & JOHANNA B	164 KOOTENAI VISTA DR		LIBBY	MT	59923-9422
56417503221020000	MILLER WILLIAM M & JOHANNA B	164 KOOTENAI VISTA DR		LIBBY	MT	59923-9422
56417503221040000	BARR JAMES P &	PO BOX 352		LIBBY	MT	59923-0352
56417503221050000	COTTER JOHN P JR & NANCY A	5011 N DARIN RD		OTIS ORCHARDS	WA	99027-9616
56417503221060000	PAULLIN HOWARD L	611 W 2ND ST		LIBBY	MT	59923-1623
56417503221070000	MILLER WILLIAM M & JOHANNA B	164 KOOTENAI VISTA DR		LIBBY	MT	59923-9422
56417503222010000	HILEMAN TOM	PO BOX 14		LIBBY	MT	59923-0014
56417503222020000	HILEMAN TOM	PO BOX 14		LIBBY	MT	59923-0014
56417503222030000	CRIMMINS FRANCIS P & KIM B	304 COLORADO AVE		LIBBY	MT	59923-1604
56417503222040000	LAMEY WILLIAM S	PO BOX 899		LIBBY	MT	59923-0899
56417503222050000	SMITH TIMOTHY C & VICTORINA O	320 COLORADO AVE		LIBBY	MT	59923-1604
56417503222060000	SMITH TIMOTHY C & VICTORINA O	320 COLORADO AVE		LIBBY	MT	59923-1604
56417503222070000	HILEMAN THOMAS M	PO BOX 14		LIBBY	MT	59923-0014
56417503222080000	HILEMAN THOMAS M	PO BOX 14		LIBBY	MT	59923-0014
56417503223010000	O'BRIEN LOUIE D & BEVERLY J	516 W 4TH ST		LIBBY	MT	59923-1608
56417503223020000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417503223030000	RHODES ASHLEY B	316 NEVADA AVE		LIBBY	MT	59923-1744
56417503223040000	HOLBROOK MELVIN W & CHERYL L	PO BOX 1493		LIBBY	MT	59923-1493
56417503223050000	AARSTAD KEVIN R	503 W 3RD ST		LIBBY	MT	59923-1613
56417503223060000	KLEPPE GENE & DEBRA	519 W 3RD ST		LIBBY	MT	59923-1613
56417503223070000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503223080000	O'BRIEN KELLY L & RHONDA R	313 COLORADO AVE		LIBBY	MT	59923-1603

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503223090000	OBRIEN KELLY L & RHONDA R	313 COLORADO AVE		LIBBY	MT	59923-1603
56417503224010000	TRAENKNER BARBARA T	12596 FOREMOST CT		NOKESVILLE	VA	20181-2739
56417503224020000	SWANSON BRUCE ALAN	PO BOX 2574		SILVERDALE	WA	98383-2574
56417503224030000	MCNAIR TIMOTHY M & LAURA B	6305 MCCALL ST LOT 2		BONNERS FERRY	ID	83805-8524
56417503224040000	BARKS JAMES B & MITZI D	311 MINERAL AVE # 176		LIBBY	MT	59923-1953
56417503224060000	KIRSCHENMANN EUGENE	925 QUARTZ RD		LIBBY	MT	59923-7701
56417503224070000	SORENSEN KENNETH & EVELNE J	1400 WINNE AVE		HELENA	MT	59601-5223
56417503224080000	HANSEN ROBERT J & SALLY A	416 W 4TH ST		LIBBY	MT	59923-1732
56417503224090000	RILEY CHARLES V	PO BOX 522		LIBBY	MT	59923-0522
56417503225010000	LUNDEVALL RANDALL W & CARREL J	PO BOX 752		LIBBY	MT	59923-0752
56417503225020000	WILLIAMS BRIAN J	312 MAIN AVE		LIBBY	MT	59923-1846
56417503225030000	DUTTON GARY M	700 MAIN ST S		MINOT	ND	58701-4635
56417503225040000	SAUBY WILFRED J & KATHY	304 MAIN AVE		LIBBY	MT	59923-1846
56417503225050000	POSTLETHWAITE TONY A & ANGELA F	109 W 2ND ST		LIBBY	MT	59923-1959
56417503225060000	DEXTER LEE MASON TTEE	303 IDAHO AVE		LIBBY	MT	59923-1735
56417503225070000	MESTICE PETER	6698 PIPE CREEK RD		LIBBY	MT	59923-9481
56417503225080000	THORNE MICHAEL E & HANNAH ALEXANDRA & VERITY RENEE	319 IDAHO AVE		LIBBY	MT	59923-1735
56417503226010000	PAYNE ROBERT R	PO BOX 381		LIBBY	MT	59923-0381
56417503226020000	KOOTENAI SURVEYORS INC	314 CALIFORNIA AVE		LIBBY	MT	59923-1938
56417503226030000	JOHNSON RONALD L & CANDACE J	17619 SE 288TH PL		KENT	WA	98042-5706
56417503226040000	SMART DONALD J & MARY L	525 RESERVE RD		LIBBY	MT	59923-8924
56417503226050000	LIBBY LODGE 2231 BENEVOLENT &	220 W 4TH ST		LIBBY	MT	59923-1840
56417503226060000	LIBBY LODGE 2231 ORDER OF ELKS	220 W 4TH ST		LIBBY	MT	59923-1840
56417503226070000	PAYNE ROBERT R & MONA E	PO BOX 381		LIBBY	MT	59923-0381
56417503226100000	SMART DONALD J & MARY L	525 RESERVE RD		LIBBY	MT	59923-8924
56417503227010000	IOOF CABINET LODGE 68	PO BOX 668		LIBBY	MT	59923-0978
56417503227020000	TUNGSTEN PROPERTIES LLC	712 CENTRAL AVE W		GREAT FALLS	MT	59404-2853
56417503227030000	PARKER LERAH	PO BOX 609		LIBBY	MT	59923-0609
56417503227040000	NORMONT PROPERTIES LLC	306 MINERAL AVE		LIBBY	MT	59923-1954
56417503227050000	NORMONT PROPERTIES LLC	306 MINERAL AVE		LIBBY	MT	59923-1954
56417503227060000	DEVLIN MARY L	1021 NEVADA AVE		LIBBY	MT	59923-1723
56417503227070000	NORMONT PROPERTIES LLC	306 MINERAL AVE		LIBBY	MT	59923-1954
56417503227080000	NOBLE MICHAEL C	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503227090000	MCCULLY MARCUS R & DEVIANN D	167 SNOWY VIEW DR		LIBBY	MT	59923-8278
56417503227100000	HAGADONE MONTANA PUBLISHING LLC	PO BOX 6200		COEUR D ALENE	ID	83816-1937
56417503227110000	POWERS GEORGINE VIRGINIA	313 CALIFORNIA AVE		LIBBY	MT	59923-1937
56417503227120000	MCNEW ZACHARIAH M & TRACY J	237 SILVERTIP WAY		TROY	MT	59935-9357
56417503227130000	AUSTIN REEDY POST #97 AMERICAN LEGION	319 CALIFORNIA AVE		LIBBY	MT	59923-1937
56417503228010000	CITIZENS TELECOMS CO OF MT	PO BOX 2629		ADDISON	TX	75001-2629
56417503228020000	OAKLAND JOAN	364 CEDARS DR		TROY	MT	59935-9897
56417503228030000	HOYER ENTERPRISES LLC	301 MINERAL AVE		LIBBY	MT	59923-1953
56417503228040000	HOYER ENTERPRISES LLC	301 MINERAL AVE		LIBBY	MT	59923-1953
56417503228050000	TRACY DICK J & RENEE L	1408 WASHINGTON AVE		LIBBY	MT	59923-2446
56417503228060000	TRAENKNER BARBARA TIPPINS	12596 FOREMOST CT		NOKESVILLE	VA	20181-2739
56417503228070000	ECHO CREEK LLC	42 LOGAN WAY		KALISPELL	MT	59901-6869
56417503228080000	TUBB STANLEY J & JONETTE M JOHNSTON	PO BOX 204		LIBBY	MT	59923-0204
56417503228090000	NOBLE MICHAEL C	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503228100000	HOYER ENTERPRISES LLC	301 MINERAL AVE		LIBBY	MT	59923-1953
56417503229040000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503229070000	LIBBY VOLUNTEER AMBULANCE SERVICE INC	PO BOX 777		LIBBY	MT	59923-0777
56417503229090000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503229100000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503230010000	SORENSEN STEVEN L & REBECCA A	422 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503230020000	BAKER EDWARD WALTER &	418 LOUISIANA AVE		LIBBY	MT	59923-2132

**APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA**

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503230030000	BAKER EDWARD WALTER &	418 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503230050000	SVENDSBYE WADE A & JESSICA N	406 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503230060000	MILLER RAYMOND LLOYD & ROBIN K	404 LOUISIANA AVE		LIBBY	MT	59923-2132
56417503230070000	TALCOTT LISA	319 N MAIN ST		LIVINGSTON	MT	59047-2016
56417503230080000	ANSARI NELLIE	409 MONTANA AVE		LIBBY	MT	59923-2039
56417503230090000	HUNTSBERGER GARY R & MARY KAY	PO BOX 647		LIBBY	MT	59923-0647
56417503230100000	GERMAN ANN C	PO BOX 1530		LIBBY	MT	59923-1530
56417503231010000	SCHRADER JOHN	422 MONTANA AVE		LIBBY	MT	59923-2040
56417503231020000	NORSTEBON CAROLYN J	36325 US HIGHWAY 2		LIBBY	MT	59923-8336
56417503231030000	SCOTT J BEN & HEATHER D	402 MONTANA AVE		LIBBY	MT	59923-2040
56417503231040000	MANAGHAN MARK L	403 MINERAL AVE		LIBBY	MT	59923-1955
56417503231060000	BIDDLE DELBERT W TTEE	MAIL TO VANZANDT FINANCIAL	14841 N HIGHWAY 41	RATHDRUM	ID	83858-8571
56417503231070000	MINERAL PLAZA LLC	PO BOX 947		LIBBY	MT	59923-0947
56417503231100000	WESTERN MT MENTAL HEALTH CENTER INC	140 N RUSSELL ST		MISSOULA	MT	59801-1704
56417503232010000	BACKEN MARINE SERVICES LLC	36510 US HIGHWAY 2		LIBBY	MT	59923-8337
56417503232020000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417503232030000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503232050000	SCHEER SAMUEL V & MITCHELL D & DEREK J &	1304 UTAH AVE		LIBBY	MT	59923-2530
56417503232060000	PARKER ESTHER L	408 MINERAL AVE		LIBBY	MT	59923-1956
56417503232070000	RYAN M SCOTT	406 MINERAL AVE		LIBBY	MT	59923-1956
56417503232080000	RIDDEL XANNIE	6633 KOOTENAI RIVER RD		LIBBY	MT	59923-8946
56417503232090000	FLATHEAD ELECTRIC COOP INC	2510 US HIGHWAY 2 E		KALISPELL	MT	59901-2312
56417503232100000	LINCOLN COUNTY CREDIT UNION	PO BOX 1586		LIBBY	MT	59923-1586
56417503233010000	BRYN PROPERTY 3 LLC	MAIL TO WERCO	400 CALIFORNIA AVE	LIBBY	MT	59923-1940
56417503233020000	BRYN PROPERTY 3 LLC	MAIL TO WERCO	400 CALIFORNIA AVE	LIBBY	MT	59923-1940
56417503233030000	BRYN PROPERTY 1 LLC	MAIL TO: WERCO	400 CALIFORNIA AVE	LIBBY	MT	59923-1940
56417503233040000	HUNTSBERGER GARY & MARY K	PO BOX 647		LIBBY	MT	59923-0647
56417503233050000	US BANK NA	4801 FEDERICA ST		OWENSBORO	KY	42301-7441
56417503233060000	BRYN PROPERTY 2 LLC	MAIL TO WERCO	400 CALIFORNIA AVE	LIBBY	MT	59923-1940
56417503233070000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417503234010000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417503234020000	STOLTZ BURTON E & LIZA J	416 MAIN AVE		LIBBY	MT	59923-1848
56417503234030000	THE HOLLINGSWORTH GROUP	PO BOX 907		LIBBY	MT	59923-0907
56417503234040000	MAAZ LLC	3970 MT HIGHWAY 37		LIBBY	MT	59923-8843
56417503234050000	KUMLE TIMOTHY I & BETH M	6371 PIPE CREEK RD		LIBBY	MT	59923-9478
56417503234060000	GREEN MEADOW HP AKA	MAIL TO MONFRIC INC	1915 MORENA BLVD	SAN DIEGO	CA	92110-3555
56417503234080000	HADER RICHARD &	419 IDAHO AVE		LIBBY	MT	59923-1737
56417503235010000	DEJONG PATRICIA L	418 IDAHO AVE		LIBBY	MT	59923-1738
56417503235020000	GREEN ROBERT B JR & KELLY L	408 IDAHO AVE		LIBBY	MT	59923-1738
56417503235030000	ROBERTS CAROL L	404 IDAHO AVE		LIBBY	MT	59923-1738
56417503235040000	RESCH SUZANNE R	173 KLATAWAH ST		LIBBY	MT	59923-3235
56417503235050000	GRAVES RUSTY L	PO BOX 1647		MEDICAL LAKE	WA	99022-1647
56417503235060000	ZIMMER JEANNETTE M	PO BOX 18		LIBBY	MT	59923-0018
56417503235070000	FARAG GEORGE S & ANNIE M	3803 E 5TH AVE		SPOKANE	WA	99202-5038
56417503236020000	MAROZZO ROBERT C	414 NEVADA AVE		LIBBY	MT	59923-1746
56417503236030000	MAROZZO ROBERT C	414 NEVADA AVE		LIBBY	MT	59923-1746
56417503236040000	NOEL WILFRED J II & JILL L	404 NEVADA AVE		LIBBY	MT	59923-1746
56417503236050000	JONES BROCK A & JERALYN J	411 COLORADO AVE		LIBBY	MT	59923-1605
56417503236060000	JELLESED RAYNARD L & JOAN L	127 CHAMPION HAUL RD S		LIBBY	MT	59923-7633
56417503236070000	JONES BROCK A & JERALYN J	411 COLORADO AVE		LIBBY	MT	59923-1605
56417503236080000	MAROZZO ROBERT C & MARIA A	414 NEVADA AVE		LIBBY	MT	59923-1746
56417503237010000	TRI-STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503237020000	REISMAN DENNIS R & RAY D	PO BOX 1118		LIBBY	MT	59923-1118
56417503237030000	HILEMAN THOMAS M	PO BOX 14		LIBBY	MT	59923-0014

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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503237040000	TRI-STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503238010000	TRI-STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503238030000	REWERTS NIKOLAUS & APRIL &	61 CABINET VIEW COUNTRY CLUB RD		LIBBY	MT	59923-8491
56417503238040000	YANDLE KIMBERLY L	2480 GRAVE CREEK RD		EUREKA	MT	59917-9608
56417503238050000	DESCH JOHN R & BARBARA J	510 NEVADA AVE		LIBBY	MT	59923-1748
56417503238060000	SWENNES MARTIN	520 NEVADA AVE		LIBBY	MT	59923-1748
56417503238070000	WARRICK WILLIAM A AND SHELLY L	PO BOX 1001		TROY	MT	59935-1001
56417503238080000	REISMAN DENNIS R & RAY D	PO BOX 1118		LIBBY	MT	59923-1118
56417503239010000	NOLAN DORMAN G & CARRIE M	520 IDAHO AVE		LIBBY	MT	59923-1740
56417503239020000	MONCUR MAX G & COLLEEN D	516 IDAHO AVE		LIBBY	MT	59923-1740
56417503239030000	CRAWFORD JEANNE S	504 IDAHO AVE		LIBBY	MT	59923-1740
56417503239040000	GROSSMANN GABRIEL A	503 NEVADA AVE		LIBBY	MT	59923-1747
56417503239050000	SIMPSON ANN M	507 NEVADA AVE		LIBBY	MT	59923-1747
56417503239060000	BURLINGAME HAROLD VERNON & PATRICIA ANN REV INTER VIVOS TR	PO BOX 1503		BONNERS FERRY	ID	83805-1503
56417503239070000	KOOTENAI VALLEY PARTNERS HABITAT FOR HUMANITY INC	PO BOX 19		LIBBY	MT	59923-0019
56417503301010000	WOOD MATT	PO BOX 1508		LIBBY	MT	59923-1508
56417503301020000	MILNER NEIL C & SETH C	PO BOX 891		LIBBY	MT	59923-0891
56417503301030000	OLSEN GARY D & BRIAN	1204 CALIFORNIA AVE		LIBBY	MT	59923-1914
56417503301040000	GWINN RICHARD W & MARSHA I	223 W OAK ST		LIBBY	MT	59923-1825
56417503301050000	KINNIBURGH DALE D JR & CATHERINE	918 IDAHO AVE PMB 210		LIBBY	MT	59923-1710
56417503301100000	MILNER NEIL C & SETH C	PO BOX 891		LIBBY	MT	59923-0891
56417503302010000	VIKING RETIREMENT ASSETS CUSTODIAN FBO	2679 SNOWSHOE RD		LIBBY	MT	59923-8349
56417503302040000	BARTON NANCY JOAN	121 2ND AVE W APT 312		KALISPELL	MT	59901-4486
56417503302050000	STOVALL REBECCA A	1114 CALIFORNIA AVE		LIBBY	MT	59923-1912
56417503302060000	WALLACE MATTHEW C	1108 CALIFORNIA AVE		LIBBY	MT	59923-1912
56417503302070000	DRAKE BETTY L	1104 CALIFORNIA AVE		LIBBY	MT	59923-1912
56417503302080000	BORGIE LLC	MAIL TO SCOTT MACDONALD	4114 MAGNA CARTA ROAD	CALABASAS	CA	91302-5723
56417503302090000	TURK MARK	1107 MAIN AVE		LIBBY	MT	59923-1823
56417503302100000	JONES MARTHA B	19760 RESERVATION RD		OKEECHOBEE	FL	34974-2733
56417503302110000	RITTER NADINE E &	1117 MAIN AVE		LIBBY	MT	59923-1823
56417503302120000	TINDALL LAURA J	703 LOUISIANA AVE		LIBBY	MT	59923-2105
56417503303010000	SMITH DAHLIA M	204 W BUSH ST		LIBBY	MT	59923-1800
56417503303020000	NEUBAUER KENNETH B & SANDRA K	1020 CALIFORNIA AVE		LIBBY	MT	59923-1910
56417503303030000	DICIOCCO THELMA J	1010 CALIFORNIA AVE		LIBBY	MT	59923-1910
56417503303040000	DICIOCCO THELMA J	1010 CALIFORNIA AVE		LIBBY	MT	59923-1910
56417503303050000	MILLER KENNETH S & RUTH	589 HUTTON DR		LIBBY	MT	59923-9412
56417503303060000	MOREY EILEEN M	105 MICHELLE LN		LIBBY	MT	59923-3024
56417503303070000	JOHNSTON KEITH HARVEY & ELLEN JEAN TTEES	1004 MAIN AVE		LIBBY	MT	59923-1822
56417503303080000	CARAWAY MARY KAREN	1011 MAIN AVE		LIBBY	MT	59923-1821
56417503303090000	FANSLER DANIELLE M	1015 MAIN AVE		LIBBY	MT	59923-1821
56417503303100000	BARNES ELEANOR M	303 W WASHINGTON ST		DEWITT	MI	48820-8923
56417503303120000	SERNA RHIANNA	167 DANIELSON RD		KALISPELL	MT	59901-7281
56417503304010000	BANK OF AMERICA	MAIL TO REVERSE MORTGAGE SOLUTIONS INC	14405 WALTERS RD STE 200	HOUSTON	TX	77014-1345
56417503304020000	TRISTAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417503304030000	SHEA DIANA L	1017 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304040000	PIERCE JAMES F & LENY BAPIAL	1019 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304050000	PIVAL ROBERT R	1027 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304060000	WILSON DONALD E & DORIS A	1031 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304070000	TRALLES STEPHEN E &	1037 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304080000	SOLOMON KATHERINE MARIE	1051 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417503304090000	BAETH RICHARD WAYNE & BRADLEY BURTON &	1040 MINERAL AVE		LIBBY	MT	59923-1927
56417503304100000	PECK MARK & THERESA J	1028 MINERAL AVE		LIBBY	MT	59923-1927
56417503304110000	LAMPTON JARED G & DEBORAH L	1022 MINERAL AVE		LIBBY	MT	59923-1927
56417503304120000	DUTTON EDWARD G	1014 MINERAL AVE		LIBBY	MT	59923-1927

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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503304130000	CASSIDY DARREL M	1010 MINERAL AVE		LIBBY	MT	59923-1927
56417503304140000	RIDDEL JOEL A	398 SHALOM DR		LIBBY	MT	59923-9396
56417503304150000	PREGNANCY CARE CENTER INC THE	PO BOX 1134		LIBBY	MT	59923-1134
56417503305010000	GRUBER JEFF & DOREEN	121 W OAK ST		LIBBY	MT	59923-1928
56417503305020000	SMYTHE ROBERTA L	113 W OAK ST		LIBBY	MT	59923-1928
56417503305030000	HANNAH KYLE A	109 W OAK ST		LIBBY	MT	59923-1928
56417503305040000	LIBBY COMMUNITY INTERAGENCIES INC	PO BOX 390		LIBBY	MT	59923-0390
56417503305060000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503305070000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503305080000	LARSON BONNIE LYNN	PO BOX 1015		TROY	MT	59935-1015
56417503305120000	LARSON BONNIE LYNN	PO BOX 1015		TROY	MT	59935-1015
56417503306010000	MOEN VIRGINIA LEE	PO BOX 973		LIBBY	MT	59923-0973
56417503306020000	NELSON JENNIFER A	1026 WASHINGTON AVE		LIBBY	MT	59923-2024
56417503306030000	EVANS KELLY W	1024 WASHINGTON AVE		LIBBY	MT	59923-2024
56417503306040000	US BANK NATIONAL ASSOCIATION	4801 FREDERICA ST		OWENSBORO	KY	42301-7441
56417503306050000	KELLEY KURT B	1010 WASHINGTON AVE		LIBBY	MT	59923-2024
56417503306060000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417503306070000	DUTTON RICHARD C & ROSALIE L	1001 MINERAL AVE		LIBBY	MT	59923-1926
56417503306080000	SICHTING DIXIE L	PO BOX 35		LIBBY	MT	59923-0035
56417503306100000	BOSCH DRIES	PO BOX 33		LIBBY	MT	59923-0033
56417503306110000	HARRIS DAVID A & KATIE S	1221 LOUISIANA AVE		LIBBY	MT	59923-2415
56417503306120000	DRAKE KATHLEEN A &	1031 MINERAL AVE		LIBBY	MT	59923-1926
56417503306130000	HERIDER WILLIAM & CHARLA	2705 SWEET TRAIL CT		BAKERSFIELD	CA	93306-2821
56417503307010000	ROSE DANIEL & MANDI	1028 MONTANA AVE		LIBBY	MT	59923-2016
56417503307020000	KOOTENAI VALLEY CHRISTIAN SCHOOL	1024 MONTANA AVE		LIBBY	MT	59923-2016
56417503307030000	ROSE DANIEL & MANDI	1028 MONTANA AVE		LIBBY	MT	59923-2016
56417503308010000	GEHRKE PAUL S JR & SHARON K	1032 LOUISIANA AVE		LIBBY	MT	59923-2112
56417503308020000	MEYER DESSIE C	1030 LOUISIANA AVE		LIBBY	MT	59923-2112
56417503308030000	RUDOLPH MAURICE A & DEBRA	10374 KREPPS DR		HUNTINGDON	PA	16652-6662
56417503308040000	RANK JEREMY & TINA	1024 LOUISIANA AVE		LIBBY	MT	59923-2112
56417503308050000	SHRINER JOSEPH R & SUSAN K	1014 LOUISIANA AVE		LIBBY	MT	59923-2112
56417503308060000	WOODRUFF GEORGE & MOLLY	1004 LOUISIANA AVE		LIBBY	MT	59923-2112
56417503308070000	ST JOHNS EVANGELICAL LUTHERAN CHURCH	1017 MONTANA AVE		LIBBY	MT	59923-2015
56417503308080000	NEILS GEORGE TRUSTEE	1017 MONTANA AVE		LIBBY	MT	59923-2015
56417503308090000	ROSE DANIEL J & MANDI L	1028 MONTANA AVE		LIBBY	MT	59923-2016
56417503308100000	ROSE DANIEL J & MANDI L	1028 MONTANA AVE		LIBBY	MT	59923-2016
56417503308110000	206 LLC	PO BOX 1522		LIBBY	MT	59923-1522
56417503308120000	RUDOLPH MAURICE A & DEBRA	10374 KREPPS DR		HUNTINGDON	PA	16652-6662
56417503308150000	ST JOHN LUTHERAN CHURCH	1017 MONTANA AVE		LIBBY	MT	59923-2015
56417503309010000	EMETT BONNIE A	1028 UTAH AVE		LIBBY	MT	59923-2122
56417503309030000	HANSEN JASON E	1022 UTAH AVE		LIBBY	MT	59923-2122
56417503309040000	MOOG BRUCE T & SANDRA L	PO BOX 424		LIBBY	MT	59923-0424
56417503309050000	SHAW-BERGET DEANNA	49 PSC 1005		FPO	AE	09593-0001
56417503309060000	DIBBLE LLOYD A & MARJORY M	475 NORTHWOOD AVE		LIBBY	MT	59923-9373
56417503309070000	FARRINGTON ROBERT & CHRISTINE &	215 MEADOWS RD		WHITEFISH	MT	59937-8420
56417503309080000	CHANDLER VANN LEE & CHERYL D	1017 LOUISIANA AVE		LIBBY	MT	59923-2111
56417503309090000	KROPP NICOLE MARIE	1021 LOUISIANA AVE		LIBBY	MT	59923-2111
56417503309100000	BALLARD MICHAEL & CARA	1031 LOUISIANA AVE		LIBBY	MT	59923-2111
56417503310010000	PEDERSEN ROBERT G	1022 DAKOTA AVE		LIBBY	MT	59923-2208
56417503310030000	HAKALA SHERI D	1014 DAKOTA AVE		LIBBY	MT	59923-2208
56417503310040000	THE HOLLINGSWORTH GROUP	PO BOX 907		LIBBY	MT	59923-0907
56417503310050000	BIGELOW THOMAS M T &	819 FERRY ST		SEDRO WOOLLEY	WA	98284-2039
56417503310060000	HUGILL GERMAINE F	411 E 10TH ST		LIBBY	MT	59923-2237
56417503310070000	CHURCH OF GOD	MAIL LOIS OSTEEN	PO BOX 119	LIBBY	MT	59923-0119

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56417503310080000	CHURCH OF GOD	MAIL LOIS OSTEEN	PO BOX 119	LIBBY	MT	59923-0119
56417503310090000	EDWARDS MARK A RT &	PO BOX 1383		LIBBY	MT	59923-1383
56417503310100000	HAYDEN RAELENE S	1019 UTAH AVE		LIBBY	MT	59923-2121
56417503310110000	TUNGSTEN HOLDINGS INC	1025 UTAH AVE		LIBBY	MT	59923-2121
56417503311010000	CARR DARRIN N	PO BOX 1623		LIBBY	MT	59923-5000
56417503311020000	CARR DARRIN N	PO BOX 1623		LIBBY	MT	59923-5000
56417503311030000	KOOTENAI VALLEY FEDERAL CREDIT UNION	PO BOX 636		LIBBY	MT	59923-0636
56417503311050000	BURBRIDGE MONTE L & KATHLEEN G	135 W GRAND AVE		ESCONDIDO	CA	92025-2601
56417503311060000	BARDOLE MICHAEL E	1017 DAKOTA AVE		LIBBY	MT	59923-2207
56417503311070000	FOSS CHIROPRACTIC PC	1021 DAKOTA AVE		LIBBY	MT	59923-2207
56417503312010000	MAKI TERRENCE W & JEANNETTE M TTEES	8127 FARM TO MARKET RD		LIBBY	MT	59923-7910
56417503312020000	CARLBERG LAURENCE & ROSALIND	1004 WISCONSIN AVE		LIBBY	MT	59923-2344
56417503312040000	PARKER MELVIN G & LERAH L	509 DAWSON ST		LIBBY	MT	59923-9106
56417503312050000	MAROZZO ROBERT C & MARIA A	414 NEVADA AVE		LIBBY	MT	59923-1746
56417503312060000	GWINN LARAYE R & JOHN W	1019 MINNESOTA AVE		LIBBY	MT	59923-2233
56417503312070000	WALDO ROBERT G	PO BOX 447		ALBION	WA	99102-0447
56417503313010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503314010000	HARMON WAYNE &	60 PINE RIDGE RD		NOXON	MT	59853-9756
56417503315010000	NJ BROOKS INC	PO BOX 433		LIBBY	MT	59923-0433
56417503316010000	SUTHERLAND MEGAN R	910 UTAH AVE		LIBBY	MT	59923-2120
56417503316020000	MILLER R JAY & XIMENITA SAENZ	18636 186TH AVE NE		WOODINVILLE	WA	98077-8232
56417503316030000	MCDONALDS CORPORATION	1110 US HIGHWAY 2 W		KALISPELL	MT	59901-3410
56417503316040000	MCDONALDS CORPORATION	1110 US HIGHWAY 2 W		KALISPELL	MT	59901-3410
56417503317010000	BRINKLEY ROBERT W & NANCY D	914 LOUISIANA AVE		LIBBY	MT	59923-2110
56417503317020000	TAGNEY YVONNE	912 LOUISIANA AVE		LIBBY	MT	59923-2110
56417503317030000	BUNN PAUL C	PO BOX 3155		COLUMBIA FALLS	MT	59912-5155
56417503317040000	BUNN PAUL C	PO BOX 3155		COLUMBIA FALLS	MT	59912-5155
56417503317050000	ARMSTRONG ROBERT W JR & ROBIN L	205 E 9TH ST		LIBBY	MT	59923-2062
56417503317060000		205 E 9TH ST		LIBBY	MT	59923-2062
56417503317070000	FREEBURY CHRISTOPHER LEE & BETHANY MORGAN	915 MONTANA AVE		LIBBY	MT	59923-2013
56417503317080000	ST JOHNS EVANGELICAL LUTHERAN CHURCH	1017 MONTANA AVE		LIBBY	MT	59923-2015
56417503318010000	NOBLE MICHAEL C & PATRICIA L	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503318020000	NOBLE MICHAEL C & PATRICIA L	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503318030000	NOBLE MICHAEL C & PATRICIA	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503318040000	NOBLE MICHAEL C & PATRICIA L	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503318050000	BUNN PAUL C	123 BOTHMAN DR		LIBBY	MT	59923-9428
56417503318060000	MILNER NEIL C & SETH C	PO BOX 891		LIBBY	MT	59923-0891
56417503318070000	MILNER NEIL C & SETH C	PO BOX 891		LIBBY	MT	59923-0891
56417503318080000	MILNER NEIL C & SETH C	PO BOX 891		LIBBY	MT	59923-0891
56417503318090000	HALL MATTHEW D	808 MINERAL AVE		LIBBY	MT	59923-1923
56417503318100000	NOBLE MICHAEL C & PATRICIA L	6669 FARM TO MARKET RD		LIBBY	MT	59923-7903
56417503319010000	HALL MATTHEW D	808 MINERAL AVE		LIBBY	MT	59923-1923
56417503319020000	DALBY STEPHEN H & PATRICIA REICHERT	PO BOX 1206		LIBBY	MT	59923-1206
56417503319030000	HERNANDEZ ANTONIO	908 MINERAL AVE		LIBBY	MT	59923-1925
56417503319040000	HIGH PLAINS PIZZA INC	PO BOX 2438		LIBERAL	KS	67905-2438
56417503319050000	HIGH PLAINS PIZZA INC	PO BOX 2438		LIBERAL	KS	67905-2438
56417503319060000	STAMY EDWARD G & CAROLYN J	917 CALIFORNIA AVE		LIBBY	MT	59923-1907
56417503320010000	FOX CHERYL A	920 CALIFORNIA AVE		LIBBY	MT	59923-1908
56417503320020000	BERNHARD LINDA L	912 CALIFORNIA AVE		LIBBY	MT	59923-1908
56417503320030000	VALLEY MASTER PARTNERSHIP LLC	MAIL TO RYAN LLC	PO BOX 56607	ATLANTA	GA	30343-0607
56417503320040000	MOODYS LLC &	284 WARDS RD		LIBBY	MT	59923-9124
56417503320050000	MOODYS LLC &	284 WARDS RD		LIBBY	MT	59923-9124
56417503320060000	JUNGST BARBARA	2000 JOHNSONS DRAW		LIBBY	MT	59923-9392
56417503320070000	COLBERG MICHAEL	PO BOX 990		LIBBY	MT	59923-0990

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503320080000	FERNANDEZ CRISTIAN & MARIA YVETTE	216 W 10TH ST		LIBBY	MT	59923-1832
56417503321010000	RANDALL KAYLEEN JEANNE	920 MAIN AVE		LIBBY	MT	59923-1820
56417503321020000	VOLKMANN CLARK PETER & BETTE R	912 MAIN AVE		LIBBY	MT	59923-1820
56417503321030000	VOLKMANN CLARK PETER & BETTE R	912 MAIN AVE		LIBBY	MT	59923-1820
56417503321040000	BOYER STEVEN A & MELANIE	910 MAIN AVE		LIBBY	MT	59923-1820
56417503321050000	PARKS TOM L & WENDY L TTEES	22571 COUNTRY SQUIRE RD		PERRIS	CA	92570-8983
56417503321060000	JONES JOHN CURTIS	319 W 9TH ST		LIBBY	MT	59923-1803
56417503321070000	SMART JAMES W TRUSTEE	915 IDAHO AVE		LIBBY	MT	59923-1709
56417503321080000	WALKER DONOVAN B & ANNE L	312 W 10TH ST		LIBBY	MT	59923-1834
56417503322010000	JOURNEY ALFRED E & EDITH C	660 FLORENCE RD		LIBBY	MT	59923-9368
56417503322020000	MATTER HIB & NANCY	808 MAIN AVE		LIBBY	MT	59923-1818
56417503322030000	STEVENS CALLIE JO &	802 MAIN AVE		LIBBY	MT	59923-1818
56417503322040000	VINSON RICHARD M & BRENDA L	PO BOX 1664		LIBBY	MT	59923-5000
56417503322050000	VINSON RICHARD M & BRENDA L	PO BOX 1664		LIBBY	MT	59923-5000
56417503323010000	FILLER ARDELL W & SHERYL L TTEES	115 W CEDAR ST		LIBBY	MT	59923-2608
56417503323030000	LAWRENCE CHARLES & VICKY	804 CALIFORNIA AVE		LIBBY	MT	59923-1906
56417503323040000	FILLER ARDELL & SHERYL TTEES	115 W CEDAR ST		LIBBY	MT	59923-2608
56417503323050000	ALPINE INN LLC	216 W 9TH ST		LIBBY	MT	59923-1866
56417503324010000	CUMMINGS RANDAL J & BEVERLY A	PO BOX 589		LIBBY	MT	59923-0589
56417503324020000	HILL MATTHEW D	808 MINERAL AVE		LIBBY	MT	59923-1923
56417503324030000	LAKE STEVEN D &	42307 N SHORT RD		DEER PARK	WA	99006-9517
56417503324040000	KOKANEE NORTHWEST LLC	PO BOX 1548		LIBBY	MT	59923-1548
56417503324050000	YARGER SUSAN	3088 MT HIGHWAY 37		LIBBY	MT	59923-9341
56417503324060000	AITKEN JEFF	1402 MT HIGHWAY 200		NOXON	MT	59853-9750
56417503324100000	KOKANEE NORTHWEST LLC	PO BOX 1548		LIBBY	MT	59923-1548
56417503325020000	LINCOLN LANES INC	PO BOX 569		LIBBY	MT	59923-0569
56417503325030000	LINCOLN LANES INC	PO BOX 569		LIBBY	MT	59923-0569
56417503325040000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325050000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325060000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325070000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325100000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325120000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325140000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503325160000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503326010000	MAJOR BRANDS DIST IMPORTS INC	600 S MAIN ST		BUTTE	MT	59701-2534
56417503326020000	LIBBY HIGH SCHOOL DISTRICT #4	724 LOUISIANA AVE		LIBBY	MT	59923-2106
56417503326030000	LIBBY HIGH SCHOOL DISTRICT #4	724 LOUISIANA AVE		LIBBY	MT	59923-2106
56417503326040000	LIBBY LOFTS LLC	MAIL TO SCOTT CURRY	PO BOX 1120	LIBBY	MT	59923-1120
56417503326050000	LIBBY HIGH SCHOOL DISTRICT #4	724 LOUISIANA AVE		LIBBY	MT	59923-2106
56417503327010000	TINDALL LAURA JANE	703 LOUISIANA AVE		LIBBY	MT	59923-2105
56417503327020000	HAFFERMAN WILLIAM C JR & ELIZABETH A	1323 CABINET AVE		LIBBY	MT	59923-2708
56417503327040000	HAFFERMAN WILLIAM C JR & ELIZABETH A	1323 CABINET AVE		LIBBY	MT	59923-2708
56417503327050000	KOOTENAI RIVER BIBLE MISSIONARY CHURCH &	PO BOX 1646		LIBBY	MT	59923-5000
56417503327060000	LECOUNT CHERYL A	PO BOX 363		LIBBY	MT	59923-0363
56417503327070000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503327080000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503328010000	KYES FRANKLIN & PENNY	PO BOX 944		LIBBY	MT	59923-0944
56417503328020000	WILLIAMS BIRDIE K &	16464 BULL LAKE RD		TROY	MT	59935-9437
56417503328030000	LINCOLN LANES INC	PO BOX 569		LIBBY	MT	59923-0569
56417503328047000	DAKOTA AVE CONDOS	810 DAKOTA AVE		LIBBY	MT	59923-2202
56417503328060000	KORTTE BARBARA J	413 E 8TH ST		LIBBY	MT	59923-2219
56417503328070000	HAGNER RUBY R	PO BOX 50342		PROVO	UT	84605-0342
56417503328080000	VOGEL JOYCE L &	529 N CENTRAL RD		LIBBY	MT	59923-8913

APPENDIX C
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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503328090000	VOGEL JOYCE L &	529 N CENTRAL RD		LIBBY	MT	59923-8913
56417503329010000	JESSOP LORETTA A	PO BOX 2249		EVERETT	WA	98213-0249
56417503329020000	JESSOP LORETTA A	PO BOX 2249		EVERETT	WA	98213-0249
56417503329030000	DUNN MICHAEL E	804 MINNESOTA AVE		LIBBY	MT	59923-2230
56417503329040000	8TH STREET EAST LLC	3635 VALE VIEW LN		MEAD	CO	80542-4500
56417503329050000	8TH STREET EAST LLC	3635 VALE VIEW LN		MEAD	CO	80542-4500
56417503329060000	8TH STREET EAST LLC	3635 VALE VIEW LN		MEAD	CO	80542-4500
56417503329070000	DAKOTA APARTMENTS LLC	3635 VALE VIEW LN		MEAD	CO	80542-4500
56417503330010000	DUFFIELD GLORIA I	612 E 9TH ST		LIBBY	MT	59923-2348
56417503330020000	GILMORE BRIAN THOMAS	814 WISCONSIN AVE		LIBBY	MT	59923-2340
56417503330030000	JENSEN LESTER L	810 WISCONSIN AVE		LIBBY	MT	59923-2340
56417503330040000	KRAFT SAMUEL L	806 WISCONSIN AVE		LIBBY	MT	59923-2340
56417503330050000	REWERTS NIKOLAUS & APRIL	61 CABINET VIEW COUNTRY CLUB RD		LIBBY	MT	59923-8491
56417503330060000	FLETCHER JIMMIE JOE	805 MINNESOTA AVE		LIBBY	MT	59923-2229
56417503330070000	GREEN ROBERT BURNETT JR & KELLY LYNN	408 IDAHO AVE		LIBBY	MT	59923-1738
56417503330080000	HILL ROBERT E & DEBRA A	813 MINNESOTA AVE		LIBBY	MT	59923-2229
56417503330090000	OLIPHANT ANN BETTINA	815 MINNESOTA AVE		LIBBY	MT	59923-2229
56417503330100000	PAPE HOWARD T JR & MISTI LYNN	821 MINNESOTA AVE		LIBBY	MT	59923-2229
56417503331010000	ANDERSON ALBERT C & SALLY J	PO BOX 266		LIBBY	MT	59923-0266
56417503331020000	CARLSON JOY L	3823 PARKHILL PL SW		CALGARY AB		
56417503331030000	HAINES WILLIAM D	808 MICHIGAN AVE		LIBBY	MT	59923-2327
56417503331040000	TESKE BARZIA B & JOANNA D	804 MICHIGAN AVE		LIBBY	MT	59923-2327
56417503331050000	BANDEMER STEPHEN K	PO BOX 1058		LIBBY	MT	59923-1058
56417503331060000	BANDEMER STEPHEN K	PO BOX 1058		LIBBY	MT	59923-1058
56417503331070000	MAGILL ARLEN AND ANGELA	807 WISCONSIN AVE		LIBBY	MT	59923-2339
56417503331100000	BECK FLOYD K	813 WISCONSIN AVE		LIBBY	MT	59923-2339
56417503332010000	HUNGER FRED C & LINDA M	6408 COUNTRY RD		SEDRO WOOLLEY	WA	98284-8943
56417503332020000	DEPUE JOANNE K	13734 19TH AVE NE		SEATTLE	WA	98125-3212
56417503332030000	DEPUE MICHAEL JOE & DIANE H	704 MICHIGAN AVE		LIBBY	MT	59923-2325
56417503332040000	VINSON RICHARD M & BRENDA L	PO BOX 1664		LIBBY	MT	59923-5000
56417503332050000	BOYD LYNN A	709 WISCONSIN AVE		LIBBY	MT	59923-2337
56417503332060000	DAHM MARTHA J	616 MAIN AVE		LIBBY	MT	59923-1814
56417503332070000	MAGILL ALLEN	719 WISCONSIN AVE		LIBBY	MT	59923-2337
56417503333010000	ZANZIG KARL	620 E 8TH ST		LIBBY	MT	59923-2316
56417503333020000	BYINGTON KRISTA JEAN &	714 WISCONSIN AVE		LIBBY	MT	59923-2338
56417503333030000	KUJAWA LOREN R	712 WISCONSIN AVE		LIBBY	MT	59923-2338
56417503333040000	CESM LLC	PO BOX 216		LIBBY	MT	59923-0216
56417503333050000	EVERETT KENNETH M & CONSTANCE F	522 CONIFER RD		LIBBY	MT	59923-2968
56417503333060000	ONEILL PAT	707 MINNESOTA AVE		LIBBY	MT	59923-2227
56417503333080000	ALEXANDER JAMES H	713 MINNESOTA AVE		LIBBY	MT	59923-2227
56417503333090000	MONIGOLD LEANN	608 E 8TH ST		LIBBY	MT	59923-2316
564175033334010000	WOOD JEANA	PO BOX 246		LIBBY	MT	59923-0246
564175033334020000	ZIMMERMAN ROBERT W & BOBBIEGENE D	519 E LINCOLN BLVD		LIBBY	MT	59923-2225
564175033334030000	AUGE ASHLEY NICOLE	507 E LINCOLN BLVD		LIBBY	MT	59923-2225
564175033334040000	FARAG GEORGE S & ANNIE MAE	3803 E 5TH AVE		SPOKANE	WA	99202-5038
564175033334050000	THOM LEROY D & ZETTA M	606 SHALOM DR		LIBBY	MT	59923-9329
564175033334060000	ANTHONY JOHN G & MARIA	512 E 8TH ST		LIBBY	MT	59923-2222
564175033334070000	HART MICHAEL A	514 E 8TH ST		LIBBY	MT	59923-2222
564175033335010000	ROMAN CATHOLIC BISHOP	PO BOX 1729		HELENA	MT	59624-1729
564175033335010000	ROMAN CATHOLIC BISHOP	PO BOX 1729		HELENA	MT	59624-1729
564175033336010000	MONHEISER MARGARET D & BARBARA A	319 E LINCOLN BLVD		LIBBY	MT	59923-2103
564175033336020000	COLBERG MICHAEL	PO BOX 990		LIBBY	MT	59923-0990
564175033336030000	FENNESSY MARK J & SANDRA J	1460 BARKLEY LN		WHITEFISH	MT	59937-3342
564175033336040000	RANDALL ALVIN G & MARBER K	309 E LINCOLN BLVD		LIBBY	MT	59923-2103

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503336050000	TINDALL LAURA J	703 LOUISIANA AVE		LIBBY	MT	59923-2105
56417503336060000	ARMSTRONG GARY & JOANN D	719 LOUISIANA AVE		LIBBY	MT	59923-2105
56417503336070000	FENNESSY MARK J	1460 BARKLEY LN		WHITEFISH	MT	59937-3342
56417503337010000	MORGAN ANDREW E	551 37TH AVE		SANTA CRUZ	CA	95062-5553
56417503337020000	MINER DOROTHEA T	MAIL TO RICHARD MINER	3550 NW ASHLAND PL	BEAVERTON	OR	97006-4617
56417503337030000	TLC ENGINEERING PE LLC	PO BOX 1120		LIBBY	MT	59923-1120
56417503337040000	PARKS TOM L & WENDY L TTEES	22571 COUNTRY SQUIRE RD		PERRIS	CA	92570-8983
56417503337050000	FLATHEAD VALLEY CHEMICAL DEPEND CLINIC	PO BOX 7115		KALISPELL	MT	59904-0115
56417503337070000	SCOTT JOHN L & PATRICIA A	721 CALIFORNIA AVE		LIBBY	MT	59923-1903
56417503338010000	NELSON JENNY R TRUSTEE	720 CALIFORNIA AVE		LIBBY	MT	59923-1904
56417503338020000	STICKNEY GREGORY & ROBERT D	712 CALIFORNIA AVE		LIBBY	MT	59923-1904
56417503338030000	FIRST METHODIST EPISCOPAL CHURCH LIBBY	713 MAIN AVE		LIBBY	MT	59923-1815
56417503338040000	FIRST METHODIST EPISCOPAL CHURCH LIBBY	713 MAIN AVE		LIBBY	MT	59923-1815
56417503338050000	FIRST METHODIST EPISCOPAL CHURCH LIBBY	713 MAIN AVE		LIBBY	MT	59923-1815
56417503338060000	ZIMMERMAN LEVI ROBERT	717 MAIN AVE		LIBBY	MT	59923-1815
56417503339010000	BECK JASON L & MELISSA I	PO BOX 606		LIBBY	MT	59923-0606
56417503339020000	FORSTER JEFFREY D & LESLIE J	243 LUSCHER DR		LIBBY	MT	59923-9522
56417503339030000	SKINNER JOHN L	709 IDAHO AVE		LIBBY	MT	59923-1705
56417503339040000	LAFONT KENNETH L & FLAVIA C	PO BOX 821		LIBBY	MT	59923-0821
56417503339050000	SKINNER JOHN L	709 IDAHO AVE		LIBBY	MT	59923-1705
56417503339060000	MILLER BRIAN J	PO BOX 413		LIBBY	MT	59923-0413
56417503339070000	HALL GREGORY S	PO BOX 171		NASHUA	MT	59248-0171
56417503339080000	REMP SHANE M	238 REMPS EXTENSION RD		LIBBY	MT	59923-7712
56417503339100000	BECK JASON L & MELISSA I	PO BOX 606		LIBBY	MT	59923-0606
56417503339120000	BECK JASON L & MELISSA I	PO BOX 606		LIBBY	MT	59923-0606
56417503340010000	LIBBY HIGH SCHOOL DISTRICT #4	724 LOUISIANA AVE		LIBBY	MT	59923-2106
56417503340020000	LIBBY HIGH SCHOOL DISTRICT #4	724 LOUISIANA AVE		LIBBY	MT	59923-2106
56417503341010000	BROWN JAMES A	8538 ARLENE RD NE		MOSES LAKE	WA	98837-3658
56417503341020000	PHOENIX MARTHA J	616 MAIN AVE		LIBBY	MT	59923-1814
56417503341030000	EVANS L CHARLES	305 W 6TH ST		LIBBY	MT	59923-1830
56417503341040000	EVANS L CHARLES	305 W 6TH ST		LIBBY	MT	59923-1830
56417503341050000	HALSEY RONALD J & DONNA M	603 IDAHO AVE		LIBBY	MT	59923-1703
56417503341060000	PATRICK TERRY & DENICE L PURDY-	610 CALIFORNIA AVE		LIBBY	MT	59923-1902
56417503341070000	DOOLEY JEFF	609 IDAHO AVE		LIBBY	MT	59923-1703
56417503341080000	PENNER JO ANN	619 IDAHO AVE		LIBBY	MT	59923-1703
56417503342010000	ENHELDER ROBERT B & KAREN R	620 CALIFORNIA AVE		LIBBY	MT	59923-1902
56417503342020000	SOUTHER DENNIS C & VALERIE K	PO BOX 845		LIBBY	MT	59923-0845
56417503342030000	PATRICK TERRY C & DENICE PURDY	610 CALIFORNIA AVE		LIBBY	MT	59923-1902
56417503342040000	NEUMANN ARLO J & MARY VIRGINIA TTEES	604 CALIFORNIA AVE		LIBBY	MT	59923-1902
56417503342050000	PAYNE ROBERT R	PO BOX 381		LIBBY	MT	59923-0381
56417503342060000	KIMBERLIN ANTHONY	PO BOX 501		LIBBY	MT	59923-0501
56417503342070000	STANLEY EARL H	MAIL TO LYNN STANLEY	838 2ND AVE E	KALISPELL	MT	59901-5411
56417503342080000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503343010000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417503343030000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417503343040000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417503343060000	ARNOLD JAMIE	450 MCMILLAN MEADOW RD		LIBBY	MT	59923-9588
56417503343100000	GLACIER BANK	PO BOX 27		KALISPELL	MT	59903-0027
56417503344010000	LOCKHART GENE T & ARLENE BAISA	118 E LINCOLN BLVD		LIBBY	MT	59923-2069
56417503344020000	FORE ROSE ELLEN	MAIL TO BILLIE J LITTLE	PO BOX 1632	LEWISTON	ID	83501-1467
56417503344030000	TAYLOR RICHARD H & RUTH A	PO BOX 294		LIBBY	MT	59923-0294
56417503344040000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503344050000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503344060000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919

**APPENDIX C
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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503344070000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417503344080000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417503345010000	WILSON LOURIE	202 E LINCOLN BLVD		LIBBY	MT	59923-2068
56417503345020000	ERHARD VIRGINIA &	614 LOUISIANA AVE		LIBBY	MT	59923-2136
56417503345030000	PEIFER SAM DOUGLAS & ESPERANZA	935 LYON AVE SPC 7		ELKO	NV	89801-4902
56417503345040000	PEIFER SAM DOUGLAS & ESPERANZA	935 LYON AVE SPC 7		ELKO	NV	89801-4902
56417503345050000	THORSTENSON RODNEY D & DEBRA M	PO BOX 197		LIBBY	MT	59923-0197
56417503345060000	LONGFELLOW SUSAN &	603 MONTANA AVE		LIBBY	MT	59923-2043
56417503345070000	EDWARDS WILLIAM E & LINDA C	609 MONTANA AVE		LIBBY	MT	59923-2043
56417503345080000	KLIPPENSTEIN WILLIAM JORGEN JR & JODIE	613 MONTANA AVE		LIBBY	MT	59923-2043
56417503345090000	WILSON LOURIE	202 E LINCOLN BLVD		LIBBY	MT	59923-2068
56417503345100000	COOPER BETTY E	212 E LINCOLN BLVD		LIBBY	MT	59923-2008
56417503345150000	THORSTENSON RODNEY D & DEBRA M	PO BOX 197		LIBBY	MT	59923-0197
56417503346010000	KING JOHN J JR & SHARI LYNN	8415 DONALD WAY		BLAINE	WA	98230-9540
56417503346020000	GILDEN JAMES H & AMY E	616 UTAH AVE		LIBBY	MT	59923-2152
56417503346030000	WHEELIS JAMES B	PO BOX 291		LIBBY	MT	59923-0291
56417503346040000	LAWSON THOMAS J	PO BOX 1211		LIBBY	MT	59923-1211
56417503346050000	BLAZI MOIRA L	603 LOUISIANA AVE		LIBBY	MT	59923-2135
56417503346060000	TINDALL LAURA J	703 LOUISIANA AVE		LIBBY	MT	59923-2105
56417503346070000	SORENSEN KENNETH W & EVELYNE J	1400 WINNE AVE		HELENA	MT	59601-5223
56417503346080000	FERCH WARREN DEAN &	619 LOUISIANA AVE		LIBBY	MT	59923-2135
56417503347010000	NELSON NILES F & ROBERTA A	322 FLORENCE RD		LIBBY	MT	59923-9303
56417503347020000	MCCRACKEN JERRY & LINDA	3918 VALLEY HAVEN DR		KINGWOOD	TX	77339-1868
56417503347030000	THE HOLLINGSWORTH GROUP	PO BOX 907		LIBBY	MT	59923-0907
56417503347040000	ROONEY KELLY &	PO BOX 1393		LIBBY	MT	59923-1393
56417503347050000	LUCE JOAN M	604 DAKOTA AVE		LIBBY	MT	59923-2246
56417503347060000	TURMAN DOUGLAS J & TERESE A	605 UTAH AVE		LIBBY	MT	59923-2151
56417503347070000	ANDERSON RANDOLPH NEAL	1015 N SHANNON LN		POST FALLS	ID	83854-6009
56417503347080000	KRAFT HARRY P JR & SANDRA E	611 UTAH AVE		LIBBY	MT	59923-2151
56417503347100000	LANCE JOHN III & PAMELA J	621 UTAH AVE		LIBBY	MT	59923-2151
56417503348010000	DALESSANDRO DANIEL C & VIDA A	24052 OUTRIGGER DR		CANYON LAKE	CA	92587-7451
56417503348020000	D'ALESSANDRO VIDA A	24052 OUTRIGGER DR		CANYON LAKE	CA	92587-7451
56417503348030000	NELSON KURT A &	608 MINNESOTA AVE		LIBBY	MT	59923-2253
56417503348040000	TRAPHAGEN SCOTT A & MARYANN	PO BOX 459		LIBBY	MT	59923-0459
56417503348050000	LIPPERT JAMES G	603 DAKOTA AVE		LIBBY	MT	59923-2245
56417503348060000	SPOONER ROBERT J & JEAN M TTEES	2366 GRANITE CREEK RD		LIBBY	MT	59923-9298
56417503348070000	GILSTRAP JOLENE	613 DAKOTA AVE		LIBBY	MT	59923-2245
56417503348080000	HUFFMAN DEBORAH ANNE	617 DAKOTA AVE		LIBBY	MT	59923-2245
56417503348090000	WINSLOW BILLIE	621 DAKOTA AVE		LIBBY	MT	59923-2245
56417503349010000	GARROW LARRY F	PO BOX 432		LIBBY	MT	59923-0432
56417503349020000	FOSGATE LONNIE JAY	612 WISCONSIN AVE		LIBBY	MT	59923-2336
56417503349030000	MUNROE FRANK J	615 E 6TH ST		LIBBY	MT	59923-2328
56417503349040000	MAKI TERRENCE W SR & JEANETTE M TTEES	8127 FARM TO MARKET RD		LIBBY	MT	59923-7910
56417503349050000	MILLER CARMEN J	609 MINNESOTA AVE		LIBBY	MT	59923-2252
56417503349060000	ROONEY BRENNNA	PO BOX 526		LIBBY	MT	59923-0526
56417503349070000	REATZ HENRY J & TAMI J	619 MINNESOTA AVE		LIBBY	MT	59923-2252
56417503350010000	BREWER TINA M &	622 MICHIGAN AVE		LIBBY	MT	59923-2323
56417503350020000	WALKER JENESE M	616 MICHIGAN AVE		LIBBY	MT	59923-2323
56417503350030000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503350040000	RENEAU CORRINNE	586 WOODLAND HEIGHTS RD		LIBBY	MT	59923-9129
56417503350050000	BUSTER JENNIFER	713 E 6TH ST		LIBBY	MT	59923-2330
56417503350060000	COLBERG MICHAEL	PO BOX 990		LIBBY	MT	59923-0990
56417503350070000	TURNER HAZEL LOUISE	607 WISCONSIN AVE		LIBBY	MT	59923-2335
56417503350080000	WASSERMAN ADAM	7141 OBELISCO CIR		CARLSBAD	CA	92009-6522

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503350090000	HELKE CONSTRUCTION LLC	285 SCHOOL ADDITION RD		SOMERS	MT	59932-9771
56417503350100000	MILLER DONNA DORIS	15440 FOOTHILL AVE		MORGAN HILL	CA	95037-9570
56417503350110000	MILLER DONNA DORIS	15440 FOOTHILL AVE		MORGAN HILL	CA	95037-9570
56417503351010000	HARDY RANDY	PO BOX 5030		QUARTZSITE	AZ	85359-5030
56417503351020000	ADKISON ROBERT	35143 US HIGHWAY 2		LIBBY	MT	59923-8478
56417503351030000	HARDY RANDY L	PO BOX 5030		QUARTZSITE	AZ	85359-5030
56417503351040000	CUNNINGHAM DAVID F	MAIL TO VERNON CUNNINGHAM	515 WISCONSIN AVE	LIBBY	MT	59923-2333
56417503351050000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503351060000	WARNER JEROME & KAREN	148 W PIPE CREEK RD		LIBBY	MT	59923-9446
56417503351070000	CUNNINGHAM SANDRIA R & GORDON G &	MAIL TO VERNON CUNNINGHAM	515 WISCONSIN AVE	LIBBY	MT	59923-2333
56417503351080000	DOTSON LARRY D	296 REMPS RD		LIBBY	MT	59923-9716
56417503352010000	RICHARDS GAYLE CISLO	612 E 6TH ST		LIBBY	MT	59923-2329
56417503352030000	O'BRIEN KELLY L & RHONDA R	313 COLORADO AVE		LIBBY	MT	59923-1603
56417503352040000	GULLINGSRUD CHAD C	PO BOX 1533		LIBBY	MT	59923-1533
56417503352050000	MCKAY KATHERYN	7565 N WINTER VIEW DR		COEUR D ALENE	ID	83815-9705
56417503352060000	GRINER ARNOLD L & CAROLE LYNN	507 MINNESOTA AVE		LIBBY	MT	59923-2250
56417503352080000	CANAVAN CAROLINE J	515 MINNESOTA AVE		LIBBY	MT	59923-2250
56417503352090000	BONIECKI ANGELA M	610 E 6TH ST		LIBBY	MT	59923-2329
56417503353010000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503353020000	WAGNER JERRY L & WILLIAM U	51 DRYROCK LN		LIBBY	MT	59923-7687
56417503353030000	SWARTZENBERGER JOE & BARBARA & ASHLEY	36643 US HIGHWAY 2		LIBBY	MT	59923-8352
56417503353040000	RALLS CHAD C &	PO BOX 380		LIBBY	MT	59923-0380
56417503353050000	VOGEL JOYCE	529 N CENTRAL RD		LIBBY	MT	59923-8913
56417503353060000	LONG JULIA C	509 DAKOTA AVE		LIBBY	MT	59923-2243
56417503353070000	WILLOUGHBY MICHAEL P & DEBORA	515 DAKOTA AVE		LIBBY	MT	59923-2243
56417503354020000	SIMONICH MARK & SANDRA ANN	509 3RD ST		HELENA	MT	59601-5337
56417503354030000	SIMONICH MARK & SANDRA ANN	509 3RD ST		HELENA	MT	59601-5337
56417503354050000	COZZI JULIA A	508 DAKOTA AVE		LIBBY	MT	59923-2244
56417503354060000	CRISMON GARY C & DEBORAH A	502 DAKOTA AVE		LIBBY	MT	59923-2244
56417503354070000	WILLIAMS JODI L	503 UTAH AVE		LIBBY	MT	59923-2149
56417503354080000	RIGGLES CECIL J JR & MARK S	MAIL TO ADRIENNE RIGGLES	507 UTAH AVE	LIBBY	MT	59923-2149
56417503354090000	BEASLEY STEPHEN & ANITA	47738 W 2ND ST		OAKRIDGE	OR	97463-9731
56417503354110000	SCHULKE EARL L TTEE	404 E 6TH ST		LIBBY	MT	59923-2255
56417503354120000	FREEBERG DEBRA S	412 E 6TH ST		LIBBY	MT	59923-2255
56417503355010000	MAXIM RODNEY E JR	422 QUARTZ RD		LIBBY	MT	59923-8903
56417503355020000	URIBE JORGE P & COLLEEN J	1505 COWEEMAN DR		KELSO	WA	98626-3101
56417503355030000	MILLS ERIC S & ELLEN L	PO BOX 1352		LIBBY	MT	59923-1352
56417503355040000	GILDEN CARLIE JEAN	504 UTAH AVE		LIBBY	MT	59923-2150
56417503355050000	HARVEY JODY P &	MAIL TO PATTY PARVARD	501 LOUISIANA AVE	LIBBY	MT	59923-2133
56417503355060000	PEREZ PHILLIP D & MARIE L	505 LOUISIANA AVE		LIBBY	MT	59923-2133
56417503355070000	SECRETARY OF HOUSING AND URBAN DEVELOPMENT	4400 WILL ROGERS PKWY STE 300		OKLAHOMA CITY	OK	73108-1870
56417503355080000	BROWN LYNN	PO BOX 474		LIBBY	MT	59923-0474
56417503355090000	COY DED L	519 LOUISIANA AVE		LIBBY	MT	59923-2133
56417503356010000	GAB THOMAS KEITH	520 LOUISIANA AVE		LIBBY	MT	59923-2134
56417503356020000	URVATER-CAMBER RT 11/28/05 &	672 MEADOW CREEK RD		BONNERS FERRY	ID	83805-5610
56417503356030000	RAINES NICHOLAS L & DEJON N	504 LOUISIANA AVE		LIBBY	MT	59923-2134
56417503356040000	PISCIOTTA DOMINIC M	503 MONTANA AVE		LIBBY	MT	59923-2041
56417503356050000	SHARP DANIEL L	7651 FARM TO MARKET RD		LIBBY	MT	59923-9592
56417503356060000	MORGAN ANDREW	335 ANCHORAGE AVE		SANTA CRUZ	CA	95062-5420
56417503356070000	ENNENGA AMY MAXIN &	422 QUARTZ RD		LIBBY	MT	59923-8903
56417503356080000	HARRIS D GREG & GLORIA FERCH	3465 FARM TO MARKET RD		LIBBY	MT	59923-9621
56417503357010000	JACKSON STEPHEN L & NANCY M	189 MANOR DR		LIBBY	MT	59923-9361
56417503357020000	BERKE KRISTINE D &	MAIL TO DON & BERNADINE SWENNES	516 MONTANA AVE	LIBBY	MT	59923-2042
56417503357030000	JONES CASEY LEE & BEAU TYLER	12880 LAKE SHORE		POULSBO	WA	98370

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503357040000	BURBRIDGE MONTE & KATHLEEN	135 W GRAND AVE		ESCONDIDO	CA	92025-2601
56417503357050000	SHAW-BERGET DEANNA M	34 PINECREST DR		LIBBY	MT	59923-8418
56417503357060000	MARTIN ROBERT H	PO BOX 102		COLUMBIA FALLS	MT	59912-0102
56417503357070000	TUNGSTEN HOLDINGS INC	1416 CABINET AVE		LIBBY	MT	59923-2709
56417503357080000	DOLEZAL DANIEL ALLEN	515 E SHERMAN AVE		COEUR D ALENE	ID	83814-2730
56417503357090000	SVERDRUP SHARRON A	259 KOOTENAI DR		LIBBY	MT	59923-9371
56417503357100000	STEPHENS GARY F TTEE	122 CENTRAL AVE		WHITEFISH	MT	59937-2549
56417503358010000	HERSMAN JERRY D & DEBRA L TTEES	PO BOX 1112		LIBBY	MT	59923-1112
56417503358020000	NELSON MARK A & JENNIFER E	512 MINERAL AVE		LIBBY	MT	59923-1958
56417503358030000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358040000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358050000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358060000	VINCENT CRYSTAL L	119 W 5TH ST		LIBBY	MT	59923-1943
56417503358070000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358080000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358090000	FIRST NATIONAL BANK IN LIBBY	PO BOX 1550		LIBBY	MT	59923-1550
56417503358100000	THOMPSON MARVEL J &	PO BOX 664		LIBBY	MT	59923-0664
56417503358120000	MT KK LLC	520 MINERAL AVE		LIBBY	MT	59923-1958
56417503359010000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417503359010000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417503360010000	AMERICAN POSTAL PROPERTIES LLC	1 PERRY CT		ARMONK	NY	10504-2528
56417503360030000	SHAFFER SUSAN	279 COLLINS MILLS RD		WEST GARDINER	ME	04345-3414
56417503360040000	MEYER YVONNA M & LAVERN L &	503 IDAHO AVE		LIBBY	MT	59923-1739
56417503360050000	HORN KATHY	1115 ROGERS LAKE RD		KILA	MT	59920-9706
56417503360060000	PLAAS RICHARD DOUGLAS	517 IDAHO AVE		LIBBY	MT	59923-1739
56417503361010000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503361030000	EDWARDS-MYSLICK SHANNON	414 UTAH AVE		LIBBY	MT	59923-2148
56417503361040000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503361050000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503361060000	ST JOHNS LUTHERAN HOSPITAL	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503361070000	MARTIN ANN	415 LOUISIANA AVE		LIBBY	MT	59923-2131
56417503361080000	HEYNE MARIANNE	101 MINERAL AVE		LIBBY	MT	59923-1949
56417503362010000	CANAVAN-FIFIELD CORRINE	420 DAKOTA AVE		LIBBY	MT	59923-2242
56417503362020000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503362030000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417503362040000	BARDOLE JON-PAUL	408 DAKOTA AVE		LIBBY	MT	59923-2242
56417503362050000	GREASON DOUGLAS P	404 DAKOTA AVE		LIBBY	MT	59923-2242
56417503362060000	KNECHT CLYDE A & CAROLYN A	403 UTAH AVE		LIBBY	MT	59923-2147
56417503362070000	ROSENCRANTZ JONI M	407 UTAH AVE		LIBBY	MT	59923-2147
56417503362080000	EDWARDS SANDRA A	PO BOX 1666		LIBBY	MT	59923-5000
56417503362090000	CARTER MARIANNE J SANFORD	PO BOX 722		LIBBY	MT	59923-0722
56417503362100000	KOOTENAI VALLEY PARTNERS HABITAT FOR HUMANITY INC	PO BOX 19		LIBBY	MT	59923-0019
56417503363010000	HENDRICKSON PATRICIA A	518 E 5TH ST		LIBBY	MT	59923-2249
56417503363020000	BURBRIDGE MONTE & KATHLEEN	410 MINNESOTA AVE		LIBBY	MT	59923-2269
56417503363030000	CHRISTIANSSEN DAVID J & JANET L TTES	6025 COBURG LN		MISSOULA	MT	59803-9500
56417503363040000	CHRISTIANSSEN DAVID J & JANET L TTES	6025 COBURG LN		MISSOULA	MT	59803-9500
56417503363050000	USDA RURAL HOUSING SERVICE	4300 GOODFELLOW BLVD BLDG 105FC-215		SAINT LOUIS	MO	63120-1703
56417503363060000	TUNGSTEN HOLDINGS INC	407 DAKOTA AVE		LIBBY	MT	59923-2241
56417503363070000	DAY VALERIE	PO BOX 1068		LIBBY	MT	59923-1068
56417503363080000	THOMPSON ASHLEY	415 DAKOTA AVE		LIBBY	MT	59923-2241
56417503363090000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417503364010000	LAWRENCE CHARLES B	804 CALIFORNIA AVE		LIBBY	MT	59923-1906
56417503364020000	GLOVER THOMAS R & JAN C	401 MINNESOTA AVE		LIBBY	MT	59923-2270
56417503364030000	MAXFIELD EVELYN	4522 N LINCOLN ST		SPOKANE	WA	99205-1232

APPENDIX C
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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503364040000	JOHNSON SHARON &	5730 MOSES ST		POCATELLO	ID	83202-2054
56417503364050000	LEANDER RICHARD FRANCIS	647 E 5TH ST		LIBBY	MT	59923-2367
56417503364070000	HUDSON STANLEY H & BLANCHE K	964 HAMMER CUTOFF RD		LIBBY	MT	59923-7649
56417503365010000	LARGE ROSLYN K	522 E 3RD ST		LIBBY	MT	59923-2235
56417503365025000	KATE PROPERTY LLC	MAIL TO WERNER	3635 VALE VIEW LN	MEAD	CO	80542-4500
56417503365030000	BECK CHARLES D	305 DAKOTA AVE		LIBBY	MT	59923-2263
56417503365040000	HARCOURT TIMOTHY J	321 DAKOTA AVE		LIBBY	MT	59923-2263
56417503365050000	MOHR MICKI	510 E 4TH ST		LIBBY	MT	59923-2266
56417503365060000	LODMAN JAMES L & LOIS F	160 MONACO DR		LAKESIDE	MT	59922-9710
56417503365070000	DELANEY RODNEY WILLIAM	70 N KEARNEY AVE		LIBBY	MT	59923-8286
56417503365155001	LARGE ROSLYN K	522 E 3RD ST		LIBBY	MT	59923-2235
56417503366010000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503366020000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503366030000	FINCHER RYAN THOMAS	320 DAKOTA AVE		LIBBY	MT	59923-2262
56417503366040000	RUCKER RENEE R	PO BOX 810		LIBBY	MT	59923-0810
56417503366050000	DIRKES MICHAEL ALLEN	308 DAKOTA AVE		LIBBY	MT	59923-2262
56417503366060000	CESM LLC	PO BOX 661		LIBBY	MT	59923-0661
56417503366070000	ST JOHNS LUTHERAN HOSPITAL	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503367010000	FC ENCORE PROPERTIES B HOLDCO LLC	MAIL TO CONSULATE HEALTH CARE	800 CONCOURSE PKWY S	MAITLAND	FL	32751-6152
56417503367050000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503367100000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503368010000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503368020000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503368030000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503368060000	ST JOHNS LUTHERAN HOSPITAL INC	209 HEALTH PARK DR		LIBBY	MT	59923-2001
56417503368180000	LC COMMUNITY HEALTH CENTER	320 E 2ND ST		LIBBY	MT	59923-2010
56417503401010000	HOOK CHARLES E & GLENA L	206 PARMENTER AVE		LIBBY	MT	59923-3222
56417503401020000	CRANE RON G & SHELLIE L	11097 W VOGEL RD		WORLEY	ID	83876-8652
56417503401030000	CRANE RON	11097 W VOGEL RD		WORLEY	ID	83876-8652
56417503401040000	MURBURG NORMAN MICHAEL JR	15501 N FLORIDA AVE		TAMPA	FL	33613-1245
56417503401060000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503401070000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503401080000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417503401090000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503401200000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503402010000	PEPPENGER BROWNLEE & DONNA M & ROBERT D	PO BOX 540		LIBBY	MT	59923-0540
56417503402020000	POSTLETHWAITE ROBERT D & RITA R	804 E 5TH STREET EXT		LIBBY	MT	59923-2347
56417503402030000	URDAHL TRENTON D & ROSA A &	794 E 5TH STREET EXT		LIBBY	MT	59923-2381
56417503402040000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503402040000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503402050000	SMITH CARLA A &	24 W VALLEY DR		KALISPELL	MT	59901-7301
56417503402050000	SMITH CARLA A &	24 W VALLEY DR		KALISPELL	MT	59901-7301
56417503402060000	TULLIS MICHAEL B	605 MICHIGAN AVE		LIBBY	MT	59923-2322
56417503402060000	TULLIS MICHAEL B	605 MICHIGAN AVE		LIBBY	MT	59923-2322
56417503402070000	ORSBORN ELVIRA	609 MICHIGAN AVE		LIBBY	MT	59923-2322
56417503402080000	BREEDEN BERNADETTE	PO BOX 252		LIBBY	MT	59923-0252
56417503402100000	PRESS LOREN	843 E LINCOLN BLVD		LIBBY	MT	59923-2386
56417503402110000	FLETCHER SHEILA M &	867 E LINCOLN BLVD		LIBBY	MT	59923-2386
56417503402120000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503402130000	COLE THOMAS J	747 FLOWER CREEK RD		LIBBY	MT	59923-9056
56417503402140000	COLE THOMAS J	747 FLOWER CREEK RD		LIBBY	MT	59923-9056
56417503402160000	CRANE RONALD	11097 W VOGEL RD		WORLEY	ID	83876-8652
56417503402170000	BLOOM MELVIN W & NANCY K	990 E LINCOLN BLVD		LIBBY	MT	59923-2363
56417503402180000	RICHARDSON ROSANNA	311 MINERAL AVE # 138		LIBBY	MT	59923-1953

**APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA**

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417503402190000	BLOOM MELVIN W & NANCY K	990 E LINCOLN BLVD		LIBBY	MT	59923-2363
56417503402200000	BLOOM MELVIN W & NANCY K	990 E LINCOLN BLVD		LIBBY	MT	59923-2363
56417503402210000	BLOOM MELVIN W & NANCY K	990 E LINCOLN BLVD		LIBBY	MT	59923-2363
56417503403010000	SARBAUM BECKY LYNN	PO BOX 869		LIBBY	MT	59923-0869
56417503403030000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403040000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403050000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403060000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403070000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403080000	BARNES RUSSELL S &	119 W 5TH ST		LIBBY	MT	59923-1943
56417503403090000	BERGEN JOHN	PO BOX 527		LIBBY	MT	59923-0527
56417503403100000	SPENCER RICHARD V	793 E 5TH STREET EXT		LIBBY	MT	59923-2354
56417503403110000	ROSENQUIST DONALD F & DIANA L	PO BOX 184		LIBBY	MT	59923-0184
56417503403120000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503403130000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417503403140000	TARBERT KIMBER L & KAY B & LEE ANN	841 E 5TH STREET EXT		LIBBY	MT	59923-2347
56417503403150000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403160000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417503403200000	NIELSEN KATHERINE JO	PO BOX 1632		LIBBY	MT	59923-5000
56417504101010000	HUNTSBERGER GARY & MARY K	PO BOX 647		LIBBY	MT	59923-0647
56417504101020000	MORTON GARY L & SARA E	743 W 2ND ST		LIBBY	MT	59923-1640
56417504101030000	HAINES DAVID A & KATHERYN A	763 W 2ND ST		LIBBY	MT	59923-1640
56417504101100000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417504101990000	STATE OF MONTANA	2701 PROSPECT AVE		HELENA	MT	59601-9746
56417504102010000	LOCKARD DUANE K &	MAIL TO MARK FENNESSY	1460 BARKLEY LN	WHITEFISH	MT	59937-3342
56417504102050000	BERTELSEN NEIL M & PHYLLIS A TTEES	217 W SPRINGCREEK RD		KALISPELL	MT	59901-3333
56417504102060000	FENNESSY J F JR TTEE &	1460 BARKLEY LN		WHITEFISH	MT	59937-3342
56417504103010000	OBRIEN KELLY L & RHONDA R	313 COLORADO AVE		LIBBY	MT	59923-1603
56417504103020000	BEASLEY JAMES M & KERRY L	PO BOX 726		LIBBY	MT	59923-0726
56417504103030000	SEMITOOL INC	9700 E HIGHWAY 290	TAX DEPT RUSS MAGINEL	AUSTIN	TX	78724-1102
56417504403010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417504404010000	JAR INVESTMENTS	MAIL ROSAUERS SUPERMARKETS	PO BOX 9000	SPOKANE	WA	99209-9000
56417504404050000	LOVELESS DENNIS G	PO BOX 44		LIBBY	MT	59923-0044
56417504404060000	AUBRI PROPERTY LLC	507 W 9TH ST		LIBBY	MT	59923-1627
56417504404070000	AUBRI PROPERTY LLC	507 W 9TH ST		LIBBY	MT	59923-1627
56417504404080000	COOL CREEK PROPERTIES LLC	20 E 5TH ST STE 200		TULSA	OK	74103-4407
56417504404090000	WOOD RICHARD S TRUSTEE	654 KOOTENAI RIVER RD		LIBBY	MT	59923-8937
56417504404100000	OBRIEN MAUREEN T	412 W 10TH ST		LIBBY	MT	59923-1728
56417504404110000	DICIOCCO THELMA &	1010 CALIFORNIA AVE		LIBBY	MT	59923-1910
56417504404120000	SOOTER JEFFREY SCOTT & LISA NOEL	PO BOX 160		LIBBY	MT	59923-0160
56417504404140000	SWENSON JANELLE &	268 GORDONS BEACH RD		TROY	MT	59935-9462
56417504404150000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417504404160000	COVEY LARRY & PAMELA	540 ELKHAVEN RD		TROY	MT	59935-8604
56417504404180000	PALMER ARNOLD G & ELAINE J	603 W 10TH ST		LIBBY	MT	59923-1720
56417504404220000	HERBIG KEVIN	PO BOX 981		TROY	MT	59935-0981
56417504404240000	ACE PROPERTIES LIBBY LLC	507 W 9TH ST		LIBBY	MT	59923-1627
56417504405010000	JOHNSON LOUISE	PO BOX 1176		LIBBY	MT	59923-1176
56417504405020000	HOWARD MARLYN G & DARLA J AS TTEES	178 HUNTER LN		LK HAVASU CTY	AZ	86403-5330
56417504405050000	FIFIELD FRANK G	1016 NEVADA AVE		LIBBY	MT	59923-1724
56417504405060000	PENG MANDY H & RICHARD K	10052 SE 218TH PL		KENT	WA	98031-2534
56417504406010000	MATOS JULIE L	1102 NEVADA AVE		LIBBY	MT	59923-1726
56417504406020000	MEADOWS JAN	1106 NEVADA AVE		LIBBY	MT	59923-1726
56417504406030000	RICE SUSAN M	1020 IDAHO AVE		LIBBY	MT	59923-1712
56417504406040000	WASSERMAN ADAM	7141 OBELISCO CIR		CARLSBAD	CA	92009-6522

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417504407010000	PAGE JAMES N	849 E STANLEY BLVD # 104		LIVERMORE	CA	94550-4008
56417504407030000	PARKER STEVE P	1208 NEVADA AVE		LIBBY	MT	59923-2633
56417504407040000	ALTO JAKE HOLDINGS LLC	436 DOAK CREEK RD		LIBBY	MT	59923-9407
56417504407050000	PRATT DARRELL E & JACQUELINE L TTEES	19 MAPLE AVE		WALKERSVILLE	MD	21793-8218
56417504407060000	LETHRUD STEVEN A TTEE	95 HIGHWOOD DR		LIBBY	MT	59923-9014
56417504408010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417504408020000	LETHRUD ROBERT W	1232 NEVADA AVE		LIBBY	MT	59923-2633
56417504408030000	THOMAS RICHARD	1238 NEVADA AVE		LIBBY	MT	59923-2633
56417504408040000	THARP DENNIS J & MARCIA JO	1248 NEVADA AVE		LIBBY	MT	59923-2633
56417504409010000	OHLAND GREGORY W & M GAIL	1247 NEVADA AVE		LIBBY	MT	59923-2634
56417504409020000	WILLIAMS LAWRENCE D SR & ELIZABETH	479 N MILNOR LAKE RD		TROY	MT	59935-9553
56417504409030000	HARRIS ANNA S	1044 GRAND AVE		OLIVEHURST	CA	95961-7015
56417504409040000	SONJU JEAN & STEVEN	1231 NEVADA AVE		LIBBY	MT	59923-2634
56417504409050000	1244 LLC	PO BOX 1522		LIBBY	MT	59923-1522
56417504409060000	1246 LLC	PO BOX 1522		LIBBY	MT	59923-1522
56417504409070000	SPOONER LANCE R & KELLY C	1756 HAVEN CT		KALISPELL	MT	59901-5105
56417504410010000	RODA JON D &	4 ALMY ST		JOHNSTON	RI	02919-5902
56417504410020000	FEDERAL NATIONAL MORTGAGE ASSOCIATION	14221 DALLAS PKWY STE 1000		DALLAS	TX	75254-2946
56417504410030000	FEDERAL NATIONAL MORTGAGE ASSOCIATION	14221 DALLAS PKWY STE 1000		DALLAS	TX	75254-2946
56417504410040000	PAGE-WATT VERNA &	12160 N DERRINGER RD		MARANA	AZ	85653-9034
56417504410050000	BEAGLE SCOTT R &	1202 IDAHO AVE		LIBBY	MT	59923-2611
56417504410060000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417504410070000	SIKES PAUL E &	1218 IDAHO AVE		LIBBY	MT	59923-2611
56417504410080000	REISMAN DENNIS	PO BOX 1118		LIBBY	MT	59923-1118
56417504411010000	DODGE TRACY ANN &	416 W OAK ST		LIBBY	MT	59923-1756
56417504411020000	ORR DARREL C & MARIANNE	9655 MT HIGHWAY 37		LIBBY	MT	59923-9253
56417504411030000	CLARK JOANNE D	1109 NEVADA AVE		LIBBY	MT	59923-1725
56417504411040000	DODD JOSEPH B &	1105 NEVADA AVE		LIBBY	MT	59923-1725
56417504411050000	NORMONT PROPERTIES LLC	306 MINERAL AVE		LIBBY	MT	59923-1954
56417504411060000	MORRILL RICK H	1102 IDAHO AVE		LIBBY	MT	59923-1714
56417504411070000	BROWN KENNETH N & JUDITH A	13440 LESTER RD NW		SILVERDALE	WA	98383-9755
56417504411080000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417504411090000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417504412010000	DEVLIN MARY L	1021 NEVADA AVE		LIBBY	MT	59923-1723
56417504412020000	WOOD MADONNA R	1027 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417504412030000	YOUNGER LINDA KAY	1005 NEVADA AVE		LIBBY	MT	59923-1723
56417504412040000	RILEY MONIKA M	1004 IDAHO AVE		LIBBY	MT	59923-1712
56417504412050000	SORENSEN KENNETH W & EVALYNE J	1400 WINNE AVE		HELENA	MT	59601-5223
56417504412060000	ANDERSON JACK JAY	311 MINERAL AVE # 135		LIBBY	MT	59923-1953
56417504412070000	RICE SUSAN M	1020 IDAHO AVE		LIBBY	MT	59923-1712
56417504413010000	DILL JERAD A & STEPHANIE L	1021 IDAHO AVE		LIBBY	MT	59923-1711
56417504413020000	WILSON CAROL ANN	1314 MINNESOTA AVE		LIBBY	MT	59923-2308
56417504413030000	WASSERMAN ADAM	7141 OBELISCO CIR		CARLSBAD	CA	92009-6522
56417504413040000	DICIOCCO THELMA	1010 CALIFORNIA AVE		LIBBY	MT	59923-1910
56417504413050000	HUCKLEBERRY HOUSE BED & BREAKFAST LLC	1004 MAIN AVE		LIBBY	MT	59923-1822
56417504413060000	SHERBO ZACHARY & TARYN	1012 MAIN AVE		LIBBY	MT	59923-1822
56417504413070000	OBLENESS MARK L & ANITA	1020 MAIN AVE		LIBBY	MT	59923-1822
56417504414010000	WOOD RICHARD S TRUSTEE	654 KOOTENAI RIVER RD		LIBBY	MT	59923-8937
56417504414020000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417504414030000	YARGER SUSAN L &	3088 MT HIGHWAY 37		LIBBY	MT	59923-9341
56417504414040000	CATALDI DENISE L	1120 MAIN AVE		LIBBY	MT	59923-1824
56417504414050000	ALLEN ROBERT L & ROBERTA	1122 MAIN AVE		LIBBY	MT	59923-1824
56417504414060000	CROOKS LESLIE L	310 W OAK ST		LIBBY	MT	59923-1828
56417504414070000	JAQUETH ERFORD ROBERT & WANDA EMMA TTEES	320 W OAK ST		LIBBY	MT	59923-1828

**APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA**

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417504414080000	DOUGLAS KAREN M	1111 IDAHO AVE		LIBBY	MT	59923-1713
56417504414090000	FIRST METHODIST CHURCH	713 MAIN AVE		LIBBY	MT	59923-1815
56417504414100000	BECKER RICHARD A & KAREN E	1103 IDAHO AVE		LIBBY	MT	59923-1713
56417504415010000	GERMANY JAMES C & STEPHANIE L	1204 MAIN AVE		LIBBY	MT	59923-2623
56417504415020000	WOOD BRENTON RICHARD & MEGAN ANN	PO BOX 274		LIBBY	MT	59923-0274
56417504415030000	MONROE JODY L &	1218 MAIN AVE		LIBBY	MT	59923-2623
56417504415040000	LEISZ MAIA K	82 COPPER RDG		SAGLE	ID	83860-5070
56417504415050000	HOLDER JAMES E &	PO BOX 1254		LIBBY	MT	59923-1254
56417504415060000	WILLIAMS DAWN J & DANNY W	1215 IDAHO AVE		LIBBY	MT	59923-2612
56417504415070000	BAXBY ROBERT J	918 IDAHO AVE # 241		LIBBY	MT	59923-1710
56417504415080000	FOSGATE LONNIE & JOAN	42245 US HIGHWAY 2		LIBBY	MT	59923-8117
56417504416010000	MULLEN CAROL L &	PO BOX 493		LIBBY	MT	59923-0493
56417504416020000	KENDRICK CHRISTOPHER M	1247 IDAHO AVE		LIBBY	MT	59923-2612
56417504416030000	RESCH PAULETTE K &	PO BOX 1002		LIBBY	MT	59923-1002
56417509107020000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417509108010000	MANCUSO KENNETH D & BEATRICE M	PO BOX 1014		LIBBY	MT	59923-1014
56417509108020000	ROBERTSON JEFFREY A & KAYLEY R	511 W BALSAM ST		LIBBY	MT	59923-2725
56417509108030000	ROBERTSON JEFFREY A & KAYLEY R	511 W BALSAM ST		LIBBY	MT	59923-2725
56417509108040000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417509108050000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417509111110000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417509111150000	HAFFERMAN WILLIAM C JR & ELIZABETH A	1323 CABINET AVE		LIBBY	MT	59923-2708
56417509111160000	SCAUFLAIRE CHRISTOPHER & SONYA	PO BOX 325		METALINE	WA	99152-0325
56417509111170000	JOHNSON RANDALL S &	1413 CABINET AVE		LIBBY	MT	59923-2710
56417509111180000	CASSIDY BERNARD & HELENA	1419 CABINET AVE		LIBBY	MT	59923-2710
56417509111190000	HILDERMAN LARRY ALLEN & LEANN RUTH CO-TTEES	1425 CABINET AVE		LIBBY	MT	59923-2710
56417509112010000	BURDICK STEVEN ALLEN &	1426 NEVADA AVE		LIBBY	MT	59923-2637
56417509112020000	WILLOUGHBY MICHAEL P II & SHELBY E	1420 NEVADA AVE		LIBBY	MT	59923-2637
56417509112030000	WILLIAMSON ANDREW B AND TRAVA D	PO BOX 357		LIBBY	MT	59923-0357
56417509112040000	CRAVER PEGGY A	1408 NEVADA AVE		LIBBY	MT	59923-2637
56417509112050000	MOORE ROBERT L JR	PO BOX 436		LIBBY	MT	59923-0436
56417509112060000	HARDGROVE AMBER D &	1318 NEVADA AVE		LIBBY	MT	59923-2635
56417509112070000	PETERSON STEVEN E & CARRIE M	1312 NEVADA AVE		LIBBY	MT	59923-2635
56417509112090000	THARP DENNIS J & MARCIA JO	1248 NEVADA AVE		LIBBY	MT	59923-2633
56417509113010000	OHLAND GREGORY W & M GAIL	1247 NEVADA AVE		LIBBY	MT	59923-2634
56417509113020000	DUFFICY ROBERT	PO BOX 870		LIBBY	MT	59923-0870
56417509113030000	RELIEN CHRISTOPHER M	PO BOX 928		LIBBY	MT	59923-0928
56417509113040000	UITHOF ALBERT E &	1319 NEVADA AVE		LIBBY	MT	59923-2636
56417509113050000	ROLL DOUGLAS K & PAMELA J	1401 NEVADA AVE		LIBBY	MT	59923-2638
56417509113060000	ENGLAND JONATHAN D & LAURA L	1405 NEVADA AVE		LIBBY	MT	59923-2638
56417509113070000	HOWARD DARLA J &	178 HUNTER LN		LK HAVASU CTY	AZ	86403-5330
56417509113080000	FOSS BRUCE E & JUDI D	1417 NEVADA AVE		LIBBY	MT	59923-2638
56417509113090000	PATTEN WILLIAM D III & ANGELA J	420 W BALSAM ST		LIBBY	MT	59923-2605
56417509113100000	TUNGSTEN HOLDINGS INC	1426 IDAHO AVE		LIBBY	MT	59923-2615
56417509113110000	CARBERRY KENNETH PATRICK	1420 IDAHO AVE		LIBBY	MT	59923-2615
56417509113130000	THEDE DANIEL J & JEAN M	1408 IDAHO AVE		LIBBY	MT	59923-2615
56417509113150000	FORSTER JEFF D & LESLIE J TTEES	243 LUSCHER DR		LIBBY	MT	59923-9522
56417509113160000	MICKELSON MARGARET A	1402 IDAHO AVE		LIBBY	MT	59923-2615
56417509113170000	JENSON ANTHONY & JESSICA	1322 IDAHO AVE		LIBBY	MT	59923-2657
56417509113180000	TIWATER VERNELLE R & RUSSELL A	1316 IDAHO AVE		LIBBY	MT	59923-2657
56417509113190000	WERNHAM RICHARD T &	PO BOX 1153		LIBBY	MT	59923-1153
56417509114010000	WILLIAMS DALE LEE & EVA L	1401 IDAHO AVE		LIBBY	MT	59923-2616
56417509114020000	HOLTHAUS TERRY A & CONNIE	PO BOX 321		LIBBY	MT	59923-0321
56417509114030000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417509114040000	PAULSON LOWELL J	PO BOX 32		LIBBY	MT	59923-0032
56417509114060000	MONTGOMERY THEODORE & SHAYLA	PO BOX 33		LIBBY	MT	59923-0033
56417509114070000	MAROZZO ROBERT C & MARIA A	414 NEVADA AVE		LIBBY	MT	59923-1746
56417509114080000	STEWART BRIAN JR & CRISTINA	1414 MAIN AVE		LIBBY	MT	59923-2627
56417509114090000	KOEHLER STANLEY L	1410 MAIN AVE		LIBBY	MT	59923-2627
56417509114100000	FANSLER CHRISTINA L	303 W LARCH ST		LIBBY	MT	59923-2622
56417509115010000	SCHELL MARK W	304 W LARCH ST		LIBBY	MT	59923-2621
56417509115020000	KIRSCHENMANN EUGENE & CLAUDETTE R	PO BOX 1295		LIBBY	MT	59923-1295
56417509115030000	VINCENT MARTIN L & TRACY A	1316 MAIN AVE		LIBBY	MT	59923-2625
56417509115040000	HERREID N DALE & MARLENE A	1304 MAIN AVE		LIBBY	MT	59923-2625
56417509115050000	BOYD KENNETH & MIRANDA	PO BOX 134		LIBBY	MT	59923-0134
56417509115060000	NAGLE JOSEPH C & JACQUELYNN LEE	1311 IDAHO AVE		LIBBY	MT	59923-2614
56417509115070000	MUELLER DANIEL J	PO BOX 96		LIBBY	MT	59923-0096
56417509115080000	DEVLIN MARY L	1021 NEVADA AVE		LIBBY	MT	59923-1723
56417509115100000	KOOTENAI VALLEY PARTNERS HABITAT FOR HUMANITY	PO BOX 19		LIBBY	MT	59923-0019
56417509401010000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417509401020000	TRISTAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417509401030000	HACKETT PATSY R	104 CEDAR STREET EXT		LIBBY	MT	59923-9042
56417509401160000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510101010000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071
56417510101020000	RIDDEL JOEL ANDREW	605 E SPRUCE ST		LIBBY	MT	59923-2317
56417510101030000	FLATHEAD ELECTRIC COOP INC	2510 US HIGHWAY 2 E		KALISPELL	MT	59901-2312
56417510101060000	STINGER WELDING MONTANA INC	MAIL TO TIMOTHY PRIEBE	PO BOX 1034	DICKINSON	ND	58602-1034
56417510101080000	BUFFALO HUMP LLC	441 W CORPORATE DR		MERIDIAN	ID	83642-8620
56417510101090000	INTERNATIONAL PAPER CO	PO BOX 2118		MEMPHIS	TN	38101-2118
56417510101110000	INTERNATIONAL PAPER CO	PO BOX 2118		MEMPHIS	TN	38101-2118
56417510101120000	ORR ROBERT P	PO BOX 91		LIBBY	MT	59923-0091
56417510101130000	COX DONALD J & LAURA M	43 WHISKEY RDG		LIBBY	MT	59923-8563
56417510101147000	OLD MILL CONDOMINIUM	1401 MINNESOTA AVE		LIBBY	MT	59923-2309
56417510101150000	COLUMBIA FALLS HOLDINGS LLC	600 S MAIN ST		BUTTE	MT	59701-2534
56417510101170000	COLUMBIA FALLS HOLDINGS	600 S MAIN ST		BUTTE	MT	59701-2534
56417510101190000	CUMMINGS RON	PO BOX 384		LIBBY	MT	59923-0384
56417510101200000	BROOKS HOLDINGS LLC	PO BOX 998		LIBBY	MT	59923-0998
56417510101210000	NOBLE INVESTMENT PROPERTIES LLC	459 EDGEWATER DR		LIBBY	MT	59923-8293
56417510101230000	DAVIS LARRY N & SHAWNEEN L	6061 LAKE CREEK RD		TROY	MT	59935-9318
56417510101250000	MILLER KEVIN W & MARY A	114 HIGHWOOD DR		LIBBY	MT	59923-9015
56417510101500000	MUSEUM INC	PO BOX 628		LIBBY	MT	59923-0628
56417510101550000	KOSKELA JEFFREY D & LISA M	PO BOX 1073		LIBBY	MT	59923-1073
56417510101570000	TIMBERLINE AUTO CENTER INC	617 MINERAL AVE		LIBBY	MT	59923-1919
56417510101600000	SCHRADE RICHARD F & KARLA M	48 CLAIRE AVE		LIBBY	MT	59923-9207
56417510201010000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417510201020000	ROWAN CRAIG G & TERESA L	111 E OAK ST		LIBBY	MT	59923-2017
56417510201030000	FIRST LUTHERAN CHURCH OF LIBBY	200 W LARCH ST		LIBBY	MT	59923-2619
56417510201040000	MCELMURRY WALTER D & ANGELA M	113 W SPRUCE ST		LIBBY	MT	59923-2450
56417510201050000	PETTIPIECE DONALD A	PO BOX 131		BLANCHARD	ID	83804-0131
56417510201060000	SONJU DEBRA K & JOAN D	117 W SPRUCE ST		LIBBY	MT	59923-2450
56417510201070000	SEE BONNIE L	119 W SPRUCE ST		LIBBY	MT	59923-2450
56417510201080000	STORY DANIEL RAYMOND II	PO BOX 771456		STEAMBOAT SPRINGS	CO	80477-1456
56417510201090000	WHITE VICTOR L & DIXIE L	205 W SPRUCE ST		LIBBY	MT	59923-2452
56417510201100000	JACKSON MICHAEL J	213 W SPRUCE ST		LIBBY	MT	59923-2452
56417510201110000	BROWN AMY LYNN	1303 MAIN AVE		LIBBY	MT	59923-2626
56417510201120000	JOHNSON CHRISTOPHER J	1321 MAIN AVE		LIBBY	MT	59923-2626
56417510201130000	BAKER DAVID K & CHARLOTTE E	246 W LARCH ST		LIBBY	MT	59923-2619
56417510201140000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510201150000	ROWBERRY CLARISE L	236 W LARCH ST		LIBBY	MT	59923-2619
56417510201160000	LEPO DEBORAH A	222 W LARCH ST		LIBBY	MT	59923-2619
56417510201170000	RIEBEN GREGORY & KIMBERLY L	2480 GRAVE CREEK RD		EUREKA	MT	59917-9608
56417510201180000	FIRST LUTHERAN CHURCH OF LIBBY	200 W LARCH ST		LIBBY	MT	59923-2619
56417510201190000	FONTAINE JANET	38 VICKS CT		LIBBY	MT	59923-8345
56417510201200000	HOUSER AMANDA L	110 W LARCH ST		LIBBY	MT	59923-2617
56417510201210000	WHITEHOUSE MILDRED B	104 W LARCH ST		LIBBY	MT	59923-2617
56417510202010000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417510202020000	HENDRICKSON MARTHA G	PO BOX 971		LIBBY	MT	59923-0971
56417510202030000	HENDRICKSON MARTHA G	PO BOX 971		LIBBY	MT	59923-0971
56417510202040000	WHITMAN PATRICIA E &	PO BOX 2054		WHITEFISH	MT	59937-2054
56417510202050000	DEPUE TONI	PO BOX 1164		LIBBY	MT	59923-1164
56417510202060000	WILSON WILLIAM S & REBEL C	1108 MONTANA AVE		LIBBY	MT	59923-2424
56417510202070000	LEWIS CAROLYN K	12211 S HARVARD RD		ROCKFORD	WA	99030-9758
56417510203010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510203020000	FISSORI MICHAEL W & SYDNEY L	178 PAUL BUNYAN LN		LIBBY	MT	59923-7991
56417510203030000	LAUER MARK A & TRACY L	1111 MONTANA AVE		LIBBY	MT	59923-2423
56417510203040000	HUNTSBERGER GARY & MARY KATE	PO BOX 647		LIBBY	MT	59923-0647
56417510203050000	NELSON JOANNE D	1119 MONTANA AVE		LIBBY	MT	59923-2423
56417510203060000	TOLGYESSY JULIA T	1310 S RIVERVIEW DR		GARDNERVILLE	NV	89460-8921
56417510203070000	MONTGOMERY BENJAMIN JACOB	1112 LOUISIANA AVE		LIBBY	MT	59923-2414
56417510203080000	LECKRONE DEAN B & CONNIE J	1108 LOUISIANA AVE		LIBBY	MT	59923-2414
56417510203090000	GAUSTAD DAVID L & KENDRA L	1104 LOUISIANA AVE		LIBBY	MT	59923-2414
56417510203100000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510204010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510204020000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417510204030000	HOLM JEREMY IOWA	1109 LOUISIANA AVE		LIBBY	MT	59923-2413
56417510204040000	MONROE NICHOLAS OREN	1218 MAIN AVE		LIBBY	MT	59923-2623
56417510204050000	WARDENSKY JAMES O & PATTI L LIFE ESTATE	1119 LOUISIANA AVE		LIBBY	MT	59923-2413
56417510204060000	ENGLAND JAMES T JR & MARY C	1116 UTAH AVE		LIBBY	MT	59923-2526
56417510204070000	ACHIEVEMENTS INC	101 MINERAL AVE		LIBBY	MT	59923-1949
56417510204080000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510205010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510205020000	WILLIAMS DUANE J & PEGGY H	1103 UTAH AVE		LIBBY	MT	59923-2525
56417510205030000	WILLIAMS DUANE J & PEGGY H	1103 UTAH AVE		LIBBY	MT	59923-2525
56417510205040000	DALBY PAMELA D	16482 BULL LAKE RD		TROY	MT	59935-9437
56417510205060000	WHITE SHERRILL L	1120 DAKOTA AVE		LIBBY	MT	59923-2542
56417510205070000	PIERSON SAMANTA K TTEE	PO BOX 691		NORTH BEND	OR	97459-0054
56417510205080000	HARMON JASON R & LONI L	1108 DAKOTA AVE		LIBBY	MT	59923-2542
56417510205090000	HARMON JASON R & LONI L	1108 DAKOTA AVE		LIBBY	MT	59923-2542
56417510205100000	RAINEY APRIL D	1102 DAKOTA AVE		LIBBY	MT	59923-2542
56417510205110000	DOTSON SUSAN	413 E SPRUCE ST		LIBBY	MT	59923-2521
56417510205120000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510206010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510206020000	FISHMAN LOUIS Z & ESMERALDA P	1103 DAKOTA AVE		LIBBY	MT	59923-2541
56417510206030000	WATERS DALE R	1113 DAKOTA AVE		LIBBY	MT	59923-2541
56417510206040000	NELSON LLOYD DEAN & GERALDINE L	PO BOX 1429		LIBBY	MT	59923-1429
56417510206050000	BARNES BRITTANI	1119 DAKOTA AVE		LIBBY	MT	59923-2541
56417510206060000	NELSON CORLISS	PO BOX 701		LIBBY	MT	59923-0701
56417510206070000	FEEBACK DEREK L & SUSAN	PO BOX 1282		LIBBY	MT	59923-1282
56417510206080000	FEEBACK DEREK L & SUSAN	PO BOX 1282		LIBBY	MT	59923-1282
56417510206090000	SHUEY STEVEN L & STEVEN LEROY	517 E SPRUCE ST		LIBBY	MT	59923-2523
56417510206100000	KORTTE JEANETTE T	511 E SPRUCE ST		LIBBY	MT	59923-2523
56417510206110000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510207010000	WILSON STEVEN P & DEBRA A	109 W LARCH ST		LIBBY	MT	59923-2618
56417510207020000	RASMUSSEN DONALD E & KRISTINA F	123 W LARCH ST		LIBBY	MT	59923-2618
56417510207030000	DAVIS R DIANE	131 W LARCH ST		LIBBY	MT	59923-2618
56417510207040000	NORMONT PROPERTIES LLC	306 MINERAL AVE		LIBBY	MT	59923-1954
56417510207050000	ROBERTSON ROGER L & MARY ANN	221 W LARCH ST		LIBBY	MT	59923-2620
56417510207060000	CUNNINGHAM BRUCE A & PEGGY L	1240 BENCH RD		FALLON	NV	89406-7353
56417510207070000	EVERETT SANDY S	237 W LARCH ST		LIBBY	MT	59923-2620
56417510207080000	SANKOT JOHN	107 W 4TH ST		FLORENCE	CO	81226-1118
56417510207090000	BRUNO RONETA F &	413 W 9TH ST		LIBBY	MT	59923-1766
56417510207100000	BUHL DAVID F	PO BOX 94		LIBBY	MT	59923-0094
56417510207110000	NEUBAUER KEVIN R	PO BOX 323		LIBBY	MT	59923-0323
56417510207130000	PARKER ROBERT A & JESSIE M	210 W BALSAM ST		LIBBY	MT	59923-2603
56417510207140000	FULLER BONNIE E &	PO BOX 603		LIBBY	MT	59923-0603
56417510207170000	ERHARD JAMES F & NANCY C	112 W BALSAM ST		LIBBY	MT	59923-2601
56417510207180000	HANLEY KERENSA	110 W BALSAM ST		LIBBY	MT	59923-2601
56417510207190000	HELBURG MICHAEL L & KRIS H	200 SKYLINE RD		LIBBY	MT	59923-7707
56417510207200000	HELBURG MICHAEL L & KRIS H	200 SKYLINE RD		LIBBY	MT	59923-7707
56417510207210000	GOLDEN GRANT	104 W BALSAM ST		LIBBY	MT	59923-2601
56417510208010000	BARROWS LORI	1205 WASHINGTON AVE		LIBBY	MT	59923-2441
56417510208030000	GERBER SANDRA M	23 FAIRBREEZE DR		PORT TOWNSEND	WA	98368-9523
56417510208040000	FENNESSY MATTHEW P	PO BOX 648		LIBBY	MT	59923-0648
56417510208050000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417510208060000	HAINES TATUM M	32 QUARTZ AVE		LIBBY	MT	59923-3233
56417510208070000	NIXON JESSE L	1218 MONTANA AVE		LIBBY	MT	59923-2426
56417510208080000	HODGE JEFFREY	1214 MONTANA AVE		LIBBY	MT	59923-2426
56417510208090000	JENKINS THOMAS R & CATHY ANN	1212 MONTANA AVE		LIBBY	MT	59923-2426
56417510208100000	JENKINS THOMAS R & CATHY ANN	1212 MONTANA AVE		LIBBY	MT	59923-2426
56417510208110000	HENDRICKSON MARTHA G	PO BOX 971		LIBBY	MT	59923-0971
56417510209010000	DAUPHINE GEORGE F	203 E LARCH ST		LIBBY	MT	59923-2411
56417510209020000	LAMKINS KATIE	866 OLD BEAR CREEK RD		LIBBY	MT	59923-7676
56417510209030000	BENSON ROBIN A	684 TAYLOR RD		LIBBY	MT	59923-9066
56417510209040000	DRURY MARJORIE L	1221 MONTANA AVE		LIBBY	MT	59923-2425
56417510209050000	VIGNALI FREDERICK A & THERESE ANN	222 E BALSAM ST		LIBBY	MT	59923-2404
56417510209060000	VIGNALI FREDERICK A & THERESE ANN	PO BOX 33		LIBBY	MT	59923-0033
56417510209070000	OSTERHUES ROGER & LYNN	514 PIONEER RD		LIBBY	MT	59923-2999
56417510209080000	RIDER GRANT & MELISSA A	1202 LOUISIANA AVE		LIBBY	MT	59923-2416
56417510210010000	BRAUN JULIUS CHARLES III & LORRAINE	1203 LOUISIANA AVE		LIBBY	MT	59923-2415
56417510210020000	DOUGLAS BILLY M AND ELSIE A &	1209 LOUISIANA AVE		LIBBY	MT	59923-2415
56417510210030000	DALBY PAMELA D	16482 BULL LAKE RD		TROY	MT	59935-9437
56417510210040000	HARRIS DAVID A & KATIE S	1221 LOUISIANA AVE		LIBBY	MT	59923-2415
56417510210050000	MAXIM INC	422 QUARTZ RD		LIBBY	MT	59923-8903
56417510210060000	HOLMES KEITH D & DEBBI A	1212 UTAH AVE		LIBBY	MT	59923-2528
56417510210070000	DUNNIGAN JAMES L & ANITA J	318 E LARCH ST		LIBBY	MT	59923-2313
56417510210080000	DUNNIGAN JAMES L & ANITA JO	318 E LARCH ST		LIBBY	MT	59923-2313
56417510211020000	HARRIS MICHAEL & LINETTE FT	PO BOX 577		MOUNT AUKUM	CA	95656-0577
56417510211030000	VANDERWEEL TOM &	551 FARMERS FLAT RD		LIBBY	MT	59923-9635
56417510211040000	RUDDOCK CATHERINE D	1213 UTAH AVE		LIBBY	MT	59923-2527
56417510211050000	JUNGST MARK STEPHEN & PHILLIP MICHAEL &	39642 US HIGHWAY 2		LIBBY	MT	59923-7616
56417510211060000	HANSON MARLA &	1221 UTAH AVE		LIBBY	MT	59923-2527
56417510211070000	ANDERSEN ALAN	1222 DAKOTA AVE		LIBBY	MT	59923-2544
56417510211080000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417510211090000	DINKINS JOHN T & KAREN M	PO BOX 1322		LIBBY	MT	59923-1322
56417510211100000	WOOD MADONNA	1027 CALIFORNIA AVE		LIBBY	MT	59923-1909
56417510211110000	PARKER GAYLE N	1202 DAKOTA AVE		LIBBY	MT	59923-2544

**APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA**

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510212010000	DOUBEK PROPERTIES LLC	1408 WASHINGTON AVE		LIBBY	MT	59923-2446
56417510212020000	DOUBEK PROPERTIES LLC	1408 WASHINGTON AVE		LIBBY	MT	59923-2446
56417510212040000	HINKLE TIMOTHY EARL & LEONA LEE TTEES	23960 HIGHWAY 76		SANTA YSABEL	CA	92070-9695
56417510212050000	NELSON LLOYD DEAN & GERALDINE L	PO BOX 1429		LIBBY	MT	59923-1429
56417510212070000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417510212080000	BEASLEY JAMES M & KERRY L	PO BOX 726		LIBBY	MT	59923-0726
56417510212090000	LINCOLN LANES INC	PO BOX 569		LIBBY	MT	59923-0569
56417510212100000	LINCOLN LANES INC	PO BOX 569		LIBBY	MT	59923-0569
56417510212120000	BEASLEY JAMES M & KERRY L	PO BOX 726		LIBBY	MT	59923-0726
56417510213010000	KELLY LARRY D & SHARON R	1304 WASHINGTON AVE		LIBBY	MT	59923-2444
56417510213020000	KLIN RICHARD M & DOROTHY M	PO BOX 380		LIBBY	MT	59923-0380
56417510213030000	SCHAUSS DIETMAR	1525 LOLO AVE		LIBBY	MT	59923-2718
56417510213040000	SCHLIEP CORLISS ANN	PO BOX 701		LIBBY	MT	59923-0701
56417510213050000	MCGILL MARC O & PEGGY L	1309 AIRTH AVE		LIBBY	MT	59923-2629
56417510213060000	CUMMINGS JOHN H	118 W POPLAR ST		LIBBY	MT	59923-2639
56417510213080000	KIM TIMOTHY & KASIE	PO BOX 603		LIBBY	MT	59923-0603
56417510213100000	KIM TIMOTHY & KASIE	PO BOX 603		LIBBY	MT	59923-0603
56417510213110000	ADKISON ROBERT L	35143 US HIGHWAY 2		LIBBY	MT	59923-8478
56417510213120000	FOSGATE LONNIE	42245 US HIGHWAY 2		LIBBY	MT	59923-8117
56417510213130000	HOLCOMB KENNETH M	213 W BALSAM ST		LIBBY	MT	59923-2604
56417510213150000	JOHNSON ROBERT	PO BOX 1314		BONNERS FERRY	ID	83805-1314
56417510213160000	OBLENESS RUTH	220 W POPLAR ST		LIBBY	MT	59923-2641
56417510213200000	ALKIRE BRYAN R & LINDA L	218 W POPLAR ST		LIBBY	MT	59923-2641
56417510213210000	OSTERHUES ROGER P & LYNN M	514 PIONEER RD		LIBBY	MT	59923-2999
56417510213220000	LOYD JOHN W & LINDA JEAN	1316 WASHINGTON AVE		LIBBY	MT	59923-2453
56417510213230000	SORENSEN KENNETH W & EVELYNE J	1400 WINNE AVE		HELENA	MT	59601-5223
56417510213240000	KELLY LARRY D & SHARON R	1304 WASHINGTON AVE		LIBBY	MT	59923-2444
56417510213990000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417510214010000	SCHERTEL DORCAS F	1303 WASHINGTON AVE		LIBBY	MT	59923-2443
56417510214020000	SCHROEDER HENRY CARL & SHERYL LYNN	1305 WASHINGTON AVE		LIBBY	MT	59923-2443
56417510214030000	NIXON MICHAEL D & TIFFANY L	1309 WASHINGTON AVE		LIBBY	MT	59923-2443
56417510214050000	HUGHES AMY	110 1/2 E POPLAR ST		LIBBY	MT	59923-2432
56417510214060000	STICKNEY STEVEN D	PO BOX 1265		COLUMBUS	MT	59019-1265
56417510214070000	STEELE AMANDA ADAMS &	1312 MONTANA AVE		LIBBY	MT	59923-2428
56417510214080000	KOEHLER GELA RAE &	1302 MONTANA AVE		LIBBY	MT	59923-2428
56417510215010000	BROU WENDY BROWN	5955 DOVER PL		NEW ORLEANS	LA	70131-4033
56417510215020000	SANDERSON BYRON K & CHELSEA M	1311 MONTANA AVE		LIBBY	MT	59923-2427
56417510215030000	SHARP BRIAN & ERIC & JESSE	CMR 480 BOX 301		APO	AE	09128-0004
56417510215040000	ROSE THOMAS & MICHELLE	1321 MONTANA AVE		LIBBY	MT	59923-2427
56417510215050000	STRIGHT ROBERT N & JERILYNN	1322 LOUISIANA AVE		LIBBY	MT	59923-2418
56417510215060000	DAVIDSEN CHRISTINE M	1320 LOUISIANA AVE		LIBBY	MT	59923-2418
56417510215070000	JONES LORETTA V	1314 LOUISIANA AVE		LIBBY	MT	59923-2418
56417510215080000	JEWELL TED A & LYNETTE M	PO BOX 552		LIBBY	MT	59923-0552
56417510215090000	JEWELL TED A & LYNETTE M	PO BOX 552		LIBBY	MT	59923-0552
56417510216010000	WALTON KENNETH E	PO BOX 782		LIBBY	MT	59923-0782
56417510216020000	HILL EUGENE E	1303 LOUISIANA AVE		LIBBY	MT	59923-2417
56417510216030000	MAY JAMES ALLEN & SHELLEY G	1313 LOUISIANA AVE		LIBBY	MT	59923-2417
56417510216040000	FOSGATE BEN	11 VISTA AVE		LIBBY	MT	59923-9025
56417510216050000	MILLER CYTHIA B & JOE A	1322 UTAH AVE		LIBBY	MT	59923-2530
56417510216060000	RICHARDS DUANE &	2709 W STATE HIGHWAY 3		YREKA	CA	96097-9004
56417510216070000	BEACH GARY R & JILL D	1310 UTAH AVE		LIBBY	MT	59923-2530
56417510216090000	SCHEER SAMUEL	1304 UTAH AVE		LIBBY	MT	59923-2530
56417510216150000	SHOCK ANITA	1321 LOUISIANA AVE		LIBBY	MT	59923-2417
56417510217010000	WILLIAMS DAVID M & KAREN D	403 E BALSAM ST		LIBBY	MT	59923-2503

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510217020000	FARRIS OREN ROBERT	PO BOX 1502		LIBBY	MT	59923-1502
56417510217030000	BRADSHAW RONALD O & MARY C	1315 UTAH AVE		LIBBY	MT	59923-2529
56417510217040000	BRADSHAW RONALD O & MARY C	1315 UTAH AVE		LIBBY	MT	59923-2529
56417510217050000	BENSON DANIELLE M	1319 UTAH AVE		LIBBY	MT	59923-2529
56417510217060000	LOCKMAN MICHELLE	15 N GREENACRES RD		SPOKANE VLY	WA	99016-7720
56417510217070000	SUTLEY WILLIAM J	PO BOX 790		EUREKA	MT	59917-0790
56417510217080000	BAMFORD BOBBIE SUE	1314 DAKOTA AVE		LIBBY	MT	59923-2546
56417510217090000	COWIN EVE MARIE	1312 DAKOTA AVE		LIBBY	MT	59923-2546
56417510217100000	BOARDNER DAN J & STACEY L	1306 DAKOTA AVE		LIBBY	MT	59923-2546
56417510217110000	WATTERS DALE	1113 DAKOTA AVE		LIBBY	MT	59923-2541
56417510218010000	VAA RAE ANNE CANAVAN	1301 DAKOTA AVE		LIBBY	MT	59923-2545
56417510218020000	HART STUART A & JANET L	1305 DAKOTA AVE		LIBBY	MT	59923-2545
56417510218030000	ERICKSON RICHARD S	PO BOX 382		LIBBY	MT	59923-0382
56417510218040000	MYERS JAMES F	1317 DAKOTA AVE		LIBBY	MT	59923-2545
56417510218050000	SIZEMORE FORREST & EVON L	1321 DAKOTA AVE		LIBBY	MT	59923-2545
56417510218060000	LARSON JOAN	516 E POPLAR ST		LIBBY	MT	59923-2539
56417510218070000	MONTANA LANDS & HOMES LLC	PO BOX 1029		LIBBY	MT	59923-1029
56417510218080000	CADY CAROL A	1314 MINNESOTA AVE		LIBBY	MT	59923-2308
56417510218090000	THOMSON DARRELL	PO BOX 512		LIBBY	MT	59923-0512
56417510218100000	JOHNSON DONALD W & CLAYTON P & CHRISTOPHER D	PO BOX 16791		MISSOULA	MT	59808-6791
56417510219010000	BOTHMAN ROCKY J & GEORGIA A	103 W POPLAR ST		LIBBY	MT	59923-2640
56417510219020000	LIBBY CHURCH OF CHRIST	PO BOX 308		LIBBY	MT	59923-0308
56417510219030000	BOYD JEANNINE L &	113 W POPLAR ST		LIBBY	MT	59923-2640
56417510219040000	JACKY MARCIA M &	121 W POPLAR ST		LIBBY	MT	59923-2640
56417510219050000	PIVAL NADINE E	201 W POPLAR ST		LIBBY	MT	59923-2642
56417510219060000	REISMAN DENNIS R & RAY D	PO BOX 1118		LIBBY	MT	59923-1118
56417510219070000	PERRY CHARLES E	PO BOX 305		LIBBY	MT	59923-0305
56417510219080000	WALSH KEITH L & PATRICIA ANN	221 W POPLAR ST		LIBBY	MT	59923-2642
56417510219090000	MANNING RAYMOND A & MARY M	3409 SW JUNIPER AVE		REDMOND	OR	97756-7679
56417510219100000	PACIFIC POWER & LIGHT CO	PO BOX 1428		LIBBY	MT	59923-1428
56417510219120000	PARKER RONALD DEWEY & JAMIL JR	200 1ST ST W		COLUMBUS	ND	58727-5105
56417510219130000	JACKY MARCIA M &	121 W POPLAR ST		LIBBY	MT	59923-2640
56417510219140000	CORTHELL JASON CHRISTOPHER & JODY ANN	1615 MAIN AVE		LIBBY	MT	59923-2632
56417510219150000	BYRNES GLORIA R JOHNSON	1621 MAIN AVE		LIBBY	MT	59923-2632
56417510219160000	PERSON PAUL &	220 W CEDAR ST		LIBBY	MT	59923-2609
56417510219170000	VOGEL LYNN A & MISTY J	208 W CEDAR ST		LIBBY	MT	59923-2609
56417510219180000	CHUMLEY JEREMIAH T & BRITTANY L	124 W CEDAR ST		LIBBY	MT	59923-2607
56417510219190000	JOHNSON WAYNE J	118 W CEDAR ST		LIBBY	MT	59923-2607
56417510219200000	STEPHENSON RAY L SURVIVING TTEE	26 MCMILLAN MOUNTAIN RD		LIBBY	MT	59923-7659
56417510219210000	LIBBY CHURCH OF CHRIST	PO BOX 308		LIBBY	MT	59923-0308
56417510219220000	WALKER BRYAN J & LEANN	108 W CEDAR ST		LIBBY	MT	59923-2607
56417510219230000	THOMPSON LOGAN R B & ANNETTE M	1412 WASHINGTON AVE		LIBBY	MT	59923-2446
56417510219240000	TRACY DICK & RENEE	1408 WASHINGTON AVE		LIBBY	MT	59923-2446
56417510220010000	BUCKNER RONALD & CAROLINE	103 E POPLAR ST		LIBBY	MT	59923-2431
56417510220020000	MCBANE DORATHEA JEAN	1409 WASHINGTON AVE		LIBBY	MT	59923-2445
56417510220030000	JORDAN ANDREA	1574 SCHOOLHOUSE LAKE RD		TROY	MT	59935-9345
56417510220040000	ROGERS MICHAEL & RUTH VAN WORTH	580 SILVER BUTTE RD		LIBBY	MT	59923-9690
56417510220050000	MAGONE THOMAS H	1414 MONTANA AVE		LIBBY	MT	59923-2430
56417510220060000	WILSON ELIZABETH G & MICHAEL	1408 MONTANA AVE		LIBBY	MT	59923-2430
56417510221010000	HILL ED & JOAN	1403 MONTANA AVE		LIBBY	MT	59923-2429
56417510221020000	HILL ED & JOAN	1403 MONTANA AVE		LIBBY	MT	59923-2429
56417510221030000	ROGERS DONALD RAY & LONNA JEAN	1415 MONTANA AVE		LIBBY	MT	59923-2429
56417510221040000	ROGERS DONALD R & LONNA J	1415 MONTANA AVE		LIBBY	MT	59923-2429
56417510221050000	ROGERS DONALD R & LONNA J	1415 MONTANA AVE		LIBBY	MT	59923-2429

**APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA**

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510221060000	WILKES DEBORAH &	1417 MONTANA AVE		LIBBY	MT	59923-2429
56417510221070000	WAGNER WILLIAM PAUL & KATHY LYNNE	200 FRANK RD TRLR 75		BELGRADE	MT	59714-9041
56417510221090000	DITCH MICHAEL J & HEATHER L	1414 LOUISIANA AVE		LIBBY	MT	59923-2420
56417510221110000	ABRAHAMSON ALFRED A & CHERYL A	1406 LOUISIANA AVE		LIBBY	MT	59923-2420
56417510221120000	ENWILLER GAYLE	1404 LOUISIANA AVE		LIBBY	MT	59923-2420
56417510222010000	SWITZER SIDNEY BRUCE	1403 LOUISIANA AVE		LIBBY	MT	59923-2419
56417510222020000	HUBBARD ZACHERY	PO BOX 5286		WHITEFISH	MT	59937-5286
56417510222030000	MORNINGSTAR GARY R & JESSICA E	PO BOX 616		LIBBY	MT	59923-0616
56417510222040000	SMITH JAMES R & IRINA V	1417 LOUISIANA AVE		LIBBY	MT	59923-2419
56417510222050000	BECKHAM CHARLES L & LAURA G	1421 LOUISIANA AVE		LIBBY	MT	59923-2419
56417510222060000	WHITEMAN NICHOLUS	PO BOX 1616		LIBBY	MT	59923-5000
56417510222070000	DRAKE VERNON C & JO A	377 LODGE POLE WAY		LIBBY	MT	59923-9474
56417510222080000	BANDEMER STEPHEN	PO BOX 1058		LIBBY	MT	59923-1058
56417510222090000	HASKINS MICHAEL S & CATHERINE TURNER	1410 UTAH AVE		LIBBY	MT	59923-2532
56417510222100000	MICHEL S SHARON R &	241 AUTUMN RD		LIBBY	MT	59923-9205
56417510222110000	DAVIS NORMA JEAN	PO BOX 1194		TROY	MT	59935-1194
56417510223010000	STEPHENS, CODY A &	405 E POPLAR ST		LIBBY	MT	59923-2517
56417510223020000	HARTER MELISSA & MICHAEL	1405 UTAH AVE		LIBBY	MT	59923-2531
56417510223030000	WACKLER TOM	2427 43RD ST		MISSOULA	MT	59803-1162
56417510223040000	MCCABE GARY	231 NW RUBY LN		COLLEGE PLACE	WA	99324-2201
56417510223050000	BUNDROCK DAN A & PATRICIA J	1421 UTAH AVE		LIBBY	MT	59923-2531
56417510223060000	ANDERSEN CAROL ANN	259 TREASURE VIEW DR		LIBBY	MT	59923-8326
56417510223070000	HANTZ JOHNNIE L	1416 DAKOTA AVE		LIBBY	MT	59923-2548
56417510223080000	SEAGER ROXANN M	10925 N CLIFF HOUSE RD		HAUSER	ID	83854-5538
56417510223090000	HOLLINGSWORTH KELLY L	1404 DAKOTA AVE		LIBBY	MT	59923-2548
56417510224010000	STERN RONALD G & CHERYL A	1403 DAKOTA AVE		LIBBY	MT	59923-2547
56417510224020000	HARBST TERRY V	MAIL TO TERESA BENNINGER	PO BOX 162	THORNDIKE	MA	01079-0162
56417510224030000	DOTSON LORRY W &	1415 DAKOTA AVE		LIBBY	MT	59923-2547
56417510224040000	SMITH STEVEN D	153 SAVAGE LN		TROY	MT	59935-9697
56417510224050000	HARRIS DAVID A	1221 LOUISIANA AVE		LIBBY	MT	59923-2415
56417510224060000	LAPKA TODD	1406 MINNESOTA AVE		LIBBY	MT	59923-2310
56417510224070000	LAPKA TODD	1406 MINNESOTA AVE		LIBBY	MT	59923-2310
56417510224080000	LAPKA TODD	1406 MINNESOTA AVE		LIBBY	MT	59923-2310
56417510224100000	LAPKA TODD	1406 MINNESOTA AVE		LIBBY	MT	59923-2310
56417510225010000	CLARK ERIC & SARA	205 MELANIE LN		LIBBY	MT	59923-8557
56417510225030000	LIBBY BAPTIST CHURCH	PO BOX 736		LIBBY	MT	59923-0736
56417510225040000	LIBBY BAPTIST CHURCH	PO BOX 736		LIBBY	MT	59923-0736
56417510225050000	LIBBY BAPTIST CHURCH	PO BOX 736		LIBBY	MT	59923-0736
56417510225060000	MINER RICHARD R	109 W CEDAR ST		LIBBY	MT	59923-2608
56417510225070000	FILLER ARDELL & SHERYL TTEES	115 W CEDAR ST		LIBBY	MT	59923-2608
56417510225080000	BURNS ANN L	3 SPRUCE CT		LIBBY	MT	59923-2644
56417510225100000	ADKINS DAVE A	183 WOODWAY AVE		LIBBY	MT	59923-2931
56417510225110000	SIDEBOTHAM LEILA M	PO BOX 786		LIBBY	MT	59923-0786
56417510225130000	JAMES RUSSELL LUTHER & HEATHER LYNN	2 PINE CT		LIBBY	MT	59923-2643
56417510225150000	COHAN MICHAEL DENNIS & PATRICIA A	4 PINE CT		LIBBY	MT	59923-2643
56417510225160000	COHAN MICHAEL DENNIS & PATRICIA A	4 PINE CT		LIBBY	MT	59923-2643
56417510225170000	COLLINSON GORDON A & BARBARA E	225 W CEDAR ST		LIBBY	MT	59923-2610
56417510225180000	BROOKS EDGER JACK & WILLIE LEOTA	217 W CEDAR ST		LIBBY	MT	59923-2610
56417510225200000	BEYZADE SHANELL	1240 MASON WAY		MCKINLEYVILLE	CA	95519-7929
56417510225220000	BEYZADE SHANELL	1240 MASON WAY		MCKINLEYVILLE	CA	95519-7929
56417510226010000	CHAPMAN JAMES DALE	201 E CEDAR ST		LIBBY	MT	59923-2407
56417510226020000	HAYES JAMES W & ALICE L	PO BOX 276		LIBBY	MT	59923-0276
56417510226030000	WILSON KEVIN W & CAROL L	1518 LOUISIANA AVE		LIBBY	MT	59923-2422
56417510226040000	MONIZ MONTIN & KATHLEEN D	1516 LOUISIANA AVE		LIBBY	MT	59923-2422

APPENDIX C
LIST OF LANDOWNERS INSIDE PROPOSED CGA

Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417510226050000	WATT JUNE DULLENTY-	211 E CEDAR ST		LIBBY	MT	59923-2407
56417510226060000	WATT JUNE DULLENTY-	211 E CEDAR ST		LIBBY	MT	59923-2407
56417510227010000	KEBSCHULL WILLIAM F JR & KARLA IVONNE	303 E CEDAR ST		LIBBY	MT	59923-2505
56417510227030000	WESTBROOK CLAUDIA J	PO BOX 1		LITTLEROCK	WA	98556-0001
56417510227040000	FISHER MATT	1520 UTAH AVE		LIBBY	MT	59923-2534
56417510227050000	NIEMI JAMES A & TARA M	PO BOX 643		LIBBY	MT	59923-0643
56417510227060000	TUNGSTEN HOLDINGS INC	PO BOX 1213		LIBBY	MT	59923-1213
56417510227070000	MACE MICHAEL	311 E CEDAR ST		LIBBY	MT	59923-2505
56417510227080000	ENTRUST ARIZONA FBO	20860 N TATUM BLVD STE 240		PHOENIX	AZ	85050-4280
56417510228010000	SWITZER CARLOS & LEEANN	PO BOX 1031		LIBBY	MT	59923-1031
56417510228020000	BASHAM JOHN S & SHARI L	417 E CEDAR ST		LIBBY	MT	59923-2507
56417510228030000	TAYLOR HUGH R II	1519 UTAH AVE		LIBBY	MT	59923-2533
56417510228040000	HUTCHISON PAULA &	1521 UTAH AVE		LIBBY	MT	59923-2533
56417510228050000	SWITZER LYDIA LEE & JUAN JUAREZ &	1522 DAKOTA AVE		LIBBY	MT	59923-2550
56417510228060000	DIMOND KELLI	PO BOX 583		WHITEFISH	MT	59937-0583
56417510228070000	VALENCIA EFRIN	PO BOX 282		LIBBY	MT	59923-0282
56417510228080000	HOLZER DAVID L	242 OBSIDIAN RD		LIBBY	MT	59923-7671
56417510228090000	SHAW LEE WILLIAM	1504 DAKOTA AVE		LIBBY	MT	59923-2550
56417510229010000	ADKISON ROBERT	35143 US HIGHWAY 2		LIBBY	MT	59923-8478
56417510229020000	KAHNT RUBY	216 W 9TH ST		LIBBY	MT	59923-1866
56417510229030000	COVEY CALEB	1511 DAKOTA AVE		LIBBY	MT	59923-2549
56417510229040000	STODDARD LU REE	PO BOX 428		LIBBY	MT	59923-0428
56417510229050000	MCLAUGHLIN WAYNE & AMY	1517 DAKOTA AVE		LIBBY	MT	59923-2549
56417510229060000	SMITH KRISTIN N &	1523 DAKOTA AVE		LIBBY	MT	59923-2549
56417510229070000	OLSEN BRIAN K	PO BOX 5623		KALISPELL	MT	59903-5623
56417510229080000	BROWN ROXANNA	1520 MINNESOTA AVE		LIBBY	MT	59923-2312
56417510229090000	MILLTOWN PROPERTIES LLC	PO BOX 5623		KALISPELL	MT	59903-5623
56417510229100000	BUNN PAUL C	PO BOX 3155		COLUMBIA FLS	MT	59912-5155
56417510229110000	LECHNER ROGER A	PO BOX 1092		LIBBY	MT	59923-1092
56417510229120000	LAMORIE JOHN R &	505 GARFIELD ST		DACONO	CO	80514-5057
56417510230020000	EVANS RICHARD J	5592 LAKE CREEK RD		TROY	MT	59935-9519
56417510230030000	EVANS RICHARD J	5592 LAKE CREEK RD		TROY	MT	59935-9519
56417510230040000	OLSEN BRIAN K	PO BOX 5623		KALISPELL	MT	59903-5623
56417510230050000	HUTTON LORNE &	509 E MAPLE ST		LIBBY	MT	59923-2513
56417510230060000	FRAMENT ELLEN D	224 NEILS LN		LIBBY	MT	59923-2653
56417510230070000	BOY SCOUTS OF AMERICA MONTANA COUNCIL	820 17TH AVE S		GREAT FALLS	MT	59405-5939
56417510230080000	ALMEIDA ENDRE C	189 VANDERWOOD RD		LIBBY	MT	59923-2962
56417510230090000	FRAMENT ELLEN D	224 NEILS LN		LIBBY	MT	59923-2653
56417510230100000	VIGNALI JOHN A & LAURA A	PO BOX 1463		LIBBY	MT	59923-1463
56417510230110000	HOLLINGSWORTH MATTHEW	PO BOX 907		LIBBY	MT	59923-0907
56417510230120000	SWARTZ SCOTT J	17644 Schwartz Nelson Rd		Broadview	MT	59015
56417510230130000	SWARTZ SCOTT J	17644 Schwartz Nelson Rd		Broadview	MT	59015
56417510231010000	FRAMENT ELLEN D	224 NEILS LN		LIBBY	MT	59923-2653
56417510231020000	LINCOLN COUNTY	512 CALIFORNIA AVE		LIBBY	MT	59923-1942
56417510231030000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510231040000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510231040000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510231050000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510231060000	KAUZLARICH RALPH J & JUDY M	781 BEANE RD		MOXEE	WA	98936-9757
56417510231070000	LINCOLN COUNTY BROADCASTERS INC	PO BOX 730		LIBBY	MT	59923-0730
56417510231090000	TRI STAR RENTALS LLC	PO BOX 1118		LIBBY	MT	59923-1118
56417510231100000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56417510231200000	STATE OF MONTANA DEPT OF TRANS	2701 PROSPECT AVE		HELENA	MT	59601-9746
56417511201010000	LINCOLN COUNTY PORT AUTHORITY	PO BOX 1071		LIBBY	MT	59923-1071

APPENDIX C
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Parcel ID	Owner Name	Owner Address 1	Owner Address 2	Owner City	Owner State	Owner Zip Code
56417511201100000	MILLPOND MOTOCROSS ASSOCIATION INC	PO BOX 1000		LIBBY	MT	59923-1000
56428333201010000	CITY OF LIBBY	PO BOX 1428		LIBBY	MT	59923-1428
56428334301040000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMF	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56428334301050000	THATCHER ROBERT LEE & RICHARD ALLEN JR	15162 YORKSHIRE LN		HUNTINGTON BH	CA	92647-2700
56428334301060000	REMP FAMILY TRUST 12-31-99	MAIL TO RANDALL C REMF	1001 MT HIGHWAY 37	LIBBY	MT	59923-8814
56428334301080000	STUBBS CALVIN R & THERESA A	556 CITY SERVICE RD		LIBBY	MT	59923-3066
56428334301100000	REMP SAND & GRAVEL INC	238 REMPS EXTENSION RD		LIBBY	MT	59923-7712