Appendix A

Long Term Infrastructure Handbook and Addendums

Table of Contents (cont.)

Revised December 2012

Revised Committee Members 2012:

		Sub Committee Assignments
Scott Walter, Chairman	EHPS Board Member	Comm. Dev. & Impact (C)
Anthony Strainer, Vice-Chair	EH City Council	Comm. Dev. & Impact
Ellen Allen, Secretary	Realtor	Comm. Dev. & Impact
Justin Murgel	EH Resident	Benchmarks & Indicators
Denice Harris	EH Res/Pre-school parent	Communications
Jan Williams	Lead Abatement Program	Comm. Dev. & Impact
Breck Scheet	EHPS Board Trustee	Communications
Joe Nye	EHPS Board Trustee	Comm. Dev. & Impact
Michael McHugh	Lewis & Clark County Plan	Comm. Dev. & Impact
Kent Kultgen	HPS Supt.	At Large
Scott Cromwell	Parent/Architect	Building Arrangement
Richard Adamson	Teacher	Building Arrangement
Faye Ann Cummings	Teacher	Benchmarks & Indicators
Mike Agostinelli, Sr.	Vice Principal	Communications
Dan Rispens	Principal	Benchmarks & Indicators (C)
Joe McMahon	Principal	Building Arrangement (C)
Jill Miller	Principal	Benchmarks & Indicators
Ron Whitmoyer	Superintendent	Building Arrangement
Jeanette Winslow	Technology Coord	Communications (C)

Original Members 2006-2007

Don Hoffman, Chairman	EHPS Board Member	Comm. Dev. & Impact (C)
Chris Anderson	EH City Council	Building Arrangement
Wayne Krieger	EH City Council	At Large
Iris Maness	EH Resident	Benchmarks & Indicators
Kent Dodge	EHPS Board Trustee	Communications
Mark Diehl	EHPS Board Trustee	Comm. Dev. & Impact
Keith Meyer	HPS Assistant Supt.	At Large
Trudy Erickson	EH RES/EHPS Para	Communications
Peggy Chappuis	Teacher	Building Arrangement
Vicki Ries	Teacher	Communications
Marty Kloker	Teacher	Building Arrangement
Mike Agostinelli, Jr.	Technology Coord	Communications (C)
Keith Obert	Principal	Benchmarks & Indicators

2012 Update to the Introduction

Since this report was originally prepared in June 2006, there have been some significant changes to our community. These notes regarding those changes are simply an attempt to make this document more current and reflective of the conditions of our community as they are today, October 1, 2012.

Since 2008, the school district has been influenced by a slower rate of growth in new home construction as a result of the economic downturn. Though affordable housing did make some advances in the last 2-3 years with growth in the Mud Springs subdivision, and the more than 60 homes in Mountain View Meadows, the growth rate of student population within the District stayed fairly stable. As the nation and world start to rebuild the economy, there will no doubt be resurgence in building, especially in the Mountain View Meadows (MVM) Subdivision which has the potential to add 1,800 new homes. Business is also responding to the direct Highway 12 corridor to commercial property within MVM. Blue Cross and Blue Shield of Montana recently authorized the purchase of 23 acres of commercial property within the subdivision. At the same time, the Montana Environmental Trust Group (METG) is working to reclaim the former Asarco property holdings under the EPA Superfund Legislation. One of their objectives is to sell off some of the 1300 acres in holdings to pay for cleanup actions. American Chemet has recently entered into a purchase agreement for 5 acres with the Montana Environmental Trust Group (METG) Trust, the Montana Department of Justice (DOJ), the US Environmental Protection Agency (EPA), the Montana Department of Environmental Quality (DEQ) and the Montana Department of Revenue (DOR). All decisions for the sale/dispersal of the property lie with the Trust (METG), the State of Montana and the US Government.

The East Helena School district has recently received a DNRC grant to sample 55 acres of the Dartman Field to the north of Radley School. As the district experiences approval of the Mountain View Meadows subdivision to expand its current phase I build out to 1,800 single dwelling homes, the planning and foresight of this committee needs to stay vigilante with its projection triggers but simultaneously look to acquire property to accommodate a much larger influx of students than these initial triggers can possibly account for. As such the district continues to pursue all reasonable property options according to a development timeline that lies completely outside of the control of the district. The Dartman property is a perfect example of property coming available in 2012 at a time when the district can only foresee future needs, but needs at this moment would indicate no immediate concern. However the action of the METG are at a now or never situation, requiring action on the part of the district or potentially subject taxpayers to future bonding costs that would be as much as 100 times the current day value of the property.

The district does have some on hand funds that are available in the Building Reserve Fund for just this type of situation. The Board has also reserved some funds in other non-budgeted line items, such as the flex fund that could be used as well. The Dartman property presents other opportunities due to its proximity to the EHPS School property.

Since that holding of 9.662 acres is contiguous to an existing site as defined in MCA 20-6-621, it would be eligible for purchase by the Trustee without the need for a “Site approval election” prior to entering into an “option” before the election.

Other property options also exist that warrant keen consideration as potential school sites. As was discussed at the October 1, 2012 meeting of the Infrastructure Committee, the property donated by R and D Partners, LLC of 9.21 acres situated in part of section 35, Township 10 North, Range 3 West as described as Amended Tract D as described on the certificate of survey dated December 13, 2004.(See Attachment A). The discussion of the groups pointed out some limitations of the property due to the Highway 12 crossing of multiple lanes of traffic and multiple rail crossings for access to this potential school site. Also, there are limitations to the site due to its geography best described as a small hill and lastly the bisecting of the property by a road, eventually splitting the property into two parcels of approximately 7 acres and 2 acres. Using “Educational Facilities: Planning, Modernization and Management” by Basil Castaldi as a source of rule of thumb minimum standards, this parcel would be substandard for the minimum 10 acre siting recommendations.

With the projected first phase of the Mountain View Meadow subdivision slated to expand to 1,800 housing units and using the previously calculated per student per housing unit calculations figure of 0.43 students/household, it becomes quite apparent that 1800 homes in our school district will impact student enrollment by as many as 774 new students. Since the current buildings are projected by the 2007 committee to hold an absolute maximum of 1323 students, this subdivision single handedly could impact the need for 3 new school buildings, each holding 250 students and at a bare minimum needing 2 elementary schools and a middle school. The property requirements to solely deal with that number and arrangement of schools would require at least 45 acres.

East Helena High School

Also considering the ongoing desire by a large number of local residents to keep their high school aged students in a community high school, the district would also be prudent to consider the acquisition of an additional 50 acres of suitable land for siting a high school. As was discussed at the October 1, 2012 meeting, the idea of a high school is a “long shot” for the East Helena community. However, three possible scenarios could transpire to create a window of opportunity for East Helena.

The first scenario would be that the Helena School District would eventually realize the need for a third High School in the greater Helena area. If East Helena had property holdings of 50 acres they may be able to leverage the Helena School Board to consider building the school on East Helena School District property. Scenario 2 would be that a group of motivated citizens could lobby the legislature to consider revoking the moratorium on new high school districts (MCA 20-6-104) or making an exception to the moratorium as was done in Ophir for the new high school at Big Sky. The third scenario would be the passing of a charter school bill by the legislature. Such legislature, if marked by a requirement of a school board to oversee the actions of a charter school, could potentially be another option. Every effort should be made however to discourage legislation related to charter schools, since the cherry picking of quality students in this situation is destructive to a free nation of choice and social and cultural diversity that currently exists in public schools.

In working on the EHPS School Board Strategic Plan, the Trustees have targeted the pursuit of ways to bring a high school to East Helena. The pursuit of information concerning the property that is contiguous with Radley School was supported by the actions of the committee on October1, 2012. Contracts with the Montana Department of Natural Resources and Conservation (DNRC) are in place and being executed at this moment to quantify the level of soil contamination on 55 acres of the METG holdings. An access argument will be signed by October 11th, 2012 with METG to gain legal access to the grounds for the purpose of investigation of soil contamination. A contract with SDL Enterprises, Inc. Box 1230 East Helena and the EHPS District is signed and simply waiting for the approval of the Access Agreement. As was pointed out, the cost of cleanup to EPA Record of Decision (ROD) standards, suggestions from the EPA School siting document and County Institutional Controls (IC) standards will enter into any consideration by the School Board to move further toward considering by the property for purchase or donation should that be an option.

2012 Update to the Initial Planning Assessment

The East Helena Public Schools is organized into three grade-level buildings that have a combined enrollment of approximately 1,148 students for the 2012-2013 school year.

Eastgate Elementary School houses 258 kindergarten through 1st grade students, the East Helena branch of Headstart, 21 Teaching and 11 instructional support staff, currently occupying 19 classrooms, a multipurpose cafeteria/gymnasium, a gymnasium, a special ed classroom, a teachers room, a computer lab, a library and a music classroom. The addition of full day kindergarten has filled Eastgate to its maximum planned classroom-use capability. Three or four small classroom spaces are used for ancillary instruction or as a staff lunchroom. Eastgate houses one part of East Helena's preschool program. Headstart uses an in-kind contribution by the School District to deliver pre-school services to students age 3 – 5 in a morning and afternoon session that have a waiting list for entrance to the program. A precarious balance of students at Eastgate makes it one of the population centers that needs close monitoring of significant overcrowding within the district.

Robert H. Radley Elementary School houses 512 students and 30 Teaching and 16 instructional support staff that are organized into 23 second through fifth grade classrooms, a Title I room, a reading tutor Room, a special education room, a single student self contained room, a music/band room, two computer labs, a conference room, a gymnasium, a cafeteria, the district kitchen, the central supply room, a library, a small teachers room and 1 small classroom size storage room. The school is also home to an office for the Center for Mental ~~Mental~~ Health Services for Radley. They occupy a classroom in the east wing of the basement. This east wing of Radley School is a structural marvel. It was built in 1963 and constructed with 12-16 inch solid steel reinforced concrete walls to serve as a fallout shelter.   Windows were added to the structure in the late 80's.

East Valley Middle School is home to 345 middle school students and 35 staff that are organized into a series of grade level teams and specialty teachers for the 6^{th}, 7^{th} and 8^{th} graders. The building houses three (3), one grade level teams composed of four teachers that specialize in mathematics, science, Communication Arts (English) and Social Studies at each grade level for a total of 12 classrooms. In addition to the 12 core curriculum area classrooms there is a Title I room, a music room, a band room, two computer labs, an art room (including a darkroom & Kiln room), a shop/practical arts room, a small computer assisted drafting and computer art lab, a small conference room, a gymnasium, a cafeteria, a library, a home economics room, a 4 office area special ed room, 3 teaming rooms, a health enhancement room and a science lab. The mechanical system of the building was built to accommodate future additions to the building of approximately 7 additional classrooms.

The district also employs 24 support staff for custodial, transportation and food services and 4.25 Central office staff to serve the 1,158 district students.

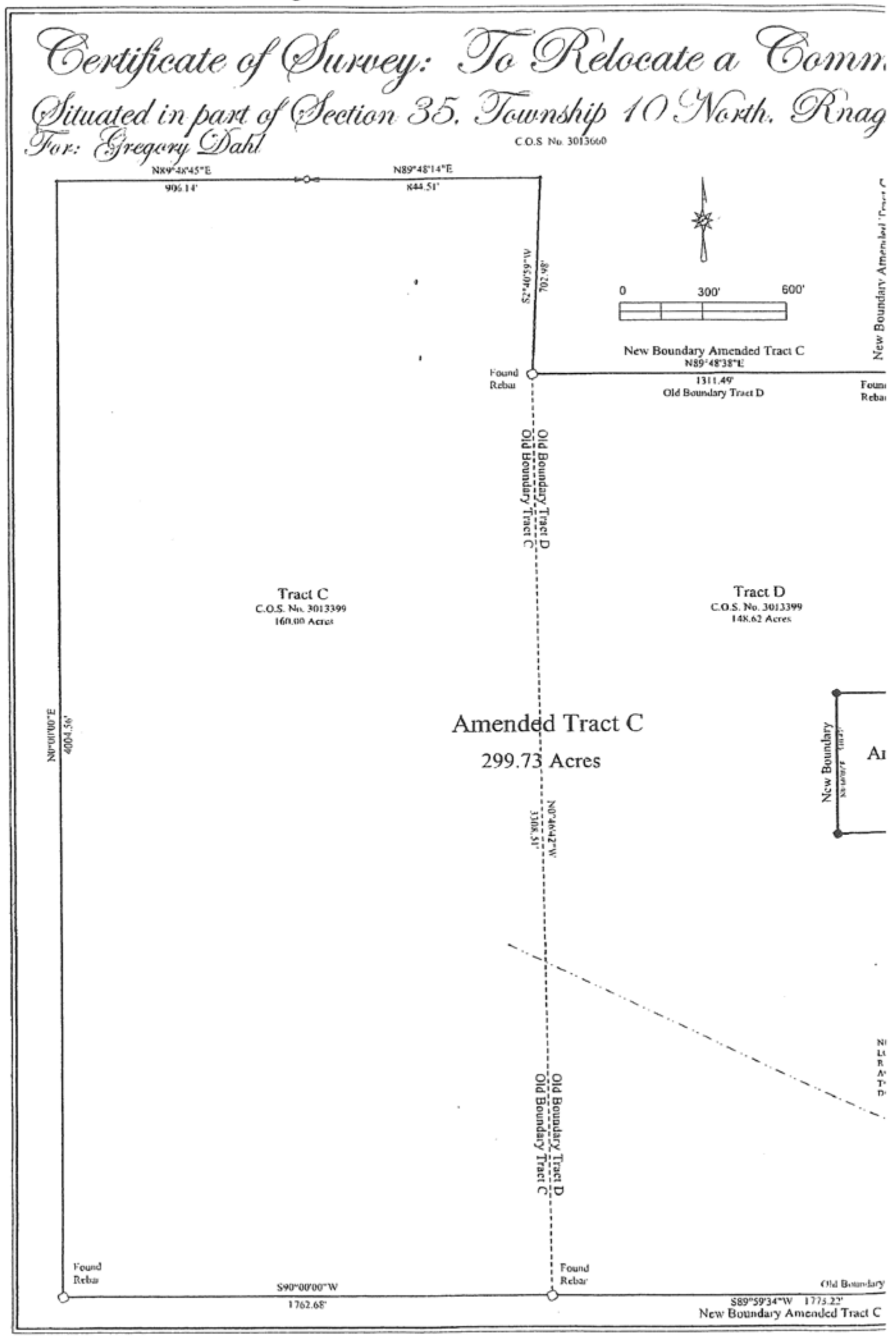
School		Grade Level	Incr/(Decr)	Fall 2008	Fall 2009	Fall 2010	Fall 2011	Current Fall 2012	Projected Fall 2013
Eastgate		K	7	142	114	128	128	**135**	135
		1	-5	116	130	121	133	**128**	135
Radley Elem		2	14	119	118	122	119	**133**	128
		3	-1	**107**	130	118	123	**122**	133
		4	19	124	**106**	131	116	**135**	122
		5	-6	127	124	**112**	131	**125**	135
East Valley MS		6	17	143	129	123	**114**	**131**	125
		7	-8	114	141	157	128	**120**	131
		8	3	123	123	144	128	**131**	120
		HS							
	TOTALS		**40**	**1115**	**1115**	**1156**	**1120**	**1160**	**1164**

Tutition Agreements

Grade	Enrollment Current	Sections 12-13	Tuition/Yr 07-08	Tuition/Yr 08-09	Tuition/Yr 09-10	10-11	11-12	12-13	13-14
Kndg	135	7 @ 19.3*	13	15	14	19	16	19	
1	128	7 @ 18.3*	13	12	17	17	19	19	
2	133	7 @ 19.0*	6	15	13	15	16	19	
3	122	6 @ 20.3*	7	7	21	11	19	14	
4	135	5 @ 27.0*	9	13	6	20	13	22	
5	125	5 @ 25.0*	8	9	10	7	21	14	
6	131	6 @ 21.8*	12	17	12	13	8	22	
7	120	6 @ 20.0	6	11	14	13	11	12	
8	131	6 @ 21.8	8	7	13	11	13	10	
	1160		**82**	**106**	**120**	**126**	**136**	**151**	**0**

* Capped

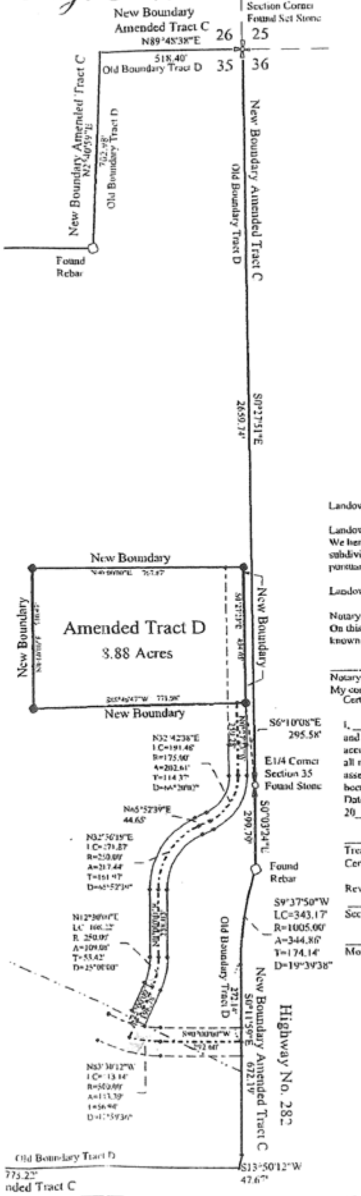
Attachment A. pg. 1/2



Attachment A pg 2/2

ommon Boundary

Rnage 3 West, P.M.M., Lewis and Clark County, Montana.



Amended Tract D:
Being a tract of land situated in part of the NW 1/4 of Section 35, Township 10 North, Range 3 West, P.M.M., Lewis and Clark County, Montana; and being more particularly described as follows: Commence at the Southeast corner of herein described tract for the point of beginning from which the East 1/4 corner of said Section 35 bears S 6°10'08"E 295.58 feet; thence from said point of beginning S88°46'47"W for 771.98 feet; thence N0°E for 510.47 feet; thence N90°E for 767.87 feet; thence S0°27' 23"E for 494.05 feet to the point of beginning containing 8.88 acres more or less and being served by and subject to right-of-ways and easements as shown, existing, or of record, including being served by a road right-of-way as shown on the attached plat.

Amended Tract C:
Being a tract of land situated in part of Section 35, Township 10 North, Range 3 West, P.M.M., Lewis and Clark County, Montana; and being more particularly described as follows: Commence at the North 1/4 corner of said Section 35 for the point of beginning; thence N89°48'14"E for 844.51 feet; thence leaving said section line S2°40'59"W for 702.98 feet; thence N89°48'38"E for 1311.49 feet; thence N2°40'59"E for 702.98 feet; thence N89°48'38"E for 518.40 feet to the Northeast corner of said section; thence along the East boundary of said section S0°27'51"E for 2659.74 feet to the East 1/4 corner; thence S0°03'24"E for 299.79 feet to the westerly boundary of Highway 282; thence along said highway right-of-way the following three (3) courses: alonga curve to the Left having a radius of 1005.00 feet from which the radius point bears S70°32'21"E, an arc length of 344.86 feet, said curve having a chord bearing of S9°37'50"W for 343.17 feet; thence S0°11'59"E for 672.19 feet; thence S13°50'12"W for 47.67 feet; thence leaving said highway S89°59'34"W for 1773.22 feet; thence S90°W for 1762.68 feet; thence N0°E for 4004.56 feet to the North boundary of said Section 35; thence along said section line N89°48'45"E for 906.14 feet to the point of beginning: EXCEPTING Amended Tract D as shown on this Certificate of Survey containing 8.88 acres more or less. Amended Tract C have a net acreage of 299.73 Acres more or less and being served by and subject to right-of-way and easements as shown, existing, or of record including a road easement serving Amended Tract D as shown on the attached plat.

Road Easement Description:
Being a road easement situated in the East 1/2 of Section 35 Township 10 North, Range 3 West, P.M.M., Lewis and Clark County, Montana; serving Amended Tract D being particularly described as follows: Commence at the East 1/4 corner of said Section 35; thence S0°03'24"E for 299.79 feet to the westerly boundary of Highway 282; thence along said highway right-of-way along a curve to the Left having a radius of 1005.00 feet from which the radius point bears S70°32'21"E, an arc length of 344.86 feet, said curve having a chord bearing of S9°37'50"W for 343.17 feet; thence S0°11'59"E for 272.14 feet to the centerline of herein described road easement centerline and true point of beginning; thence along the centerline of a 100.0 feet wide road easement the following two (2) courses: S90°W for 292.60 feet; thence along a 500.00 feet radius curve to the Right (chord bears N83°30'12"W 113.14 feet) 113.39 feet; thence along the centerline of a 64.0 feet wide road easement the following seven (7) courses: N25°E for 198.78 feet; thence along a 250.00 feet radius curve to the Left (chord bears N12°30'E 108.22 feet) 109.08 feet; thence N0°E for 238.03 feet; thence along a 250.00 feet radius curve to the Right (chord bears N32°56'19"E 271.87 feet) 287.44 feet; thence N65°52'39"E for 44.65 feet; thence along a 175.00 feet radius curve to the Left (chord bears N32°42'38"E 191.48 feet) 202.61 feet; thence N0°27'23"W for 259.28 feet to the point of terminus.

Landowner's Certification:

Landowners' Certification:
We hereby certify that the purpose of this survey is to relocate a common boundary line between adjoining properties outside a planed subdivision and that no additional parcels are hereby created. Therefore, this division of land is exempt from review as a subdivision pursuant to section 76-3-207(1)(a), MCA.

Landowner(s): ________________ ________________

Notary:
On this ____ day of __________ 20 ___, before me a Notary Public for the State of Montana, personally appeared ______________________ known to me to be the persons whose names are subscribed to the within instrument, and acknowledged to me that they executed the same.

______________________ Residing at __________
Notary Public for the State of Montana
My commission expires _____________.

Certificate of Treasurer:

I, ______________________, Treasurer of Lewis and Clark County, Montana, do hereby certify that the accompanying plat has been duly examined and that all real property taxes and special assessments assessed and levied on the land to be subdivided have been paid.
Dated this ______ day of _______________, 20___.

____
Treasurer of Lewis and Clark County

Certificate of Examination:

Reviewed for errors and omissions this the _____day of _________________20___, pursuant to Section 76-3-611(2)(a), MCA.

____
Montana Registration No. ____________

Certificate of Clerk and Recorder:

I,________________, Clerk and Recorder of Lewis and Clark County, Montana, do hereby certify that the foregoing instrument was filed in my office at ___o'clock, (am or pm), the ____day of _________, AD, 20___, and recorded in Book _______ of Plats on Page ______, Records of the Clerk and Recorder, Lewis and Clark County, Montana.

____
Clerk and Recorder

Certificate of Surveyor:

I hereby certify the attached plat is a true representation of a survey performed under my supervision and completed on December 10, 2004 and described the same as shown on the accompanying plat in accordance with the provisions of the Montana Subdivision and Platting Act.
Dated this 13th day of December

Surveyor: ______________________
Donald M. Schauber L.S.
P.O. Box 177
Townsend, Mt. 59644

MONTANA
DONALD M. SCHAUBER
5430 S
REGISTERED
LAND SURVEYOR

LEGEND

- SECTION CORNER
- Quarter Corner
- Found Rebar
- Set Rebar
- Point of Record

Sec. 35 T.10N.,R.3W., Lewis & Clark Co.			
FOR: Gregory Dahl			
Type: Boundary Relocation			
Schauber Surveying			266-4602
SCALE 300 Ft/In	DATE 12-13-2004	FILE NAME 2060COSTRY	
DRAWN BY bms	REVISION	SHEET 1/1	JOB 2060

Basis of Bearing - Certificate of Survey No. 3013399

Attachment B.

Montana Code Annotated 2011

20-6-621. Selection of school sites -- approval election. (1) (a) Except as provided in subsection (1)(b), the trustees of a district may select the sites for school buildings or for other school purposes, but the selection must first be approved by the qualified electors of the district before a contract for the purchase of a site is entered into by the trustees.

(b) The trustees may purchase or otherwise acquire property contiguous to an existing site that is in use for school purposes without a site approval election. The trustees may take an option on a site prior to the site approval election.

(2) The election for the approval of a site must be called under the provisions of 20-20-201 and must be conducted in the manner prescribed by this title for school elections. An elector who may vote at a school site election is qualified to vote under the provisions of 20-20-301. If a majority of those voting at the election approve the site selection, the trustees may purchase the site. A site approval election is not required when the site was specifically identified in an election at which an additional levy or the issuance of bonds was approved for the purchase of the site.

(3) Any site for a school building or other building of the district that is selected or purchased by the trustees must:

(a) be in a place that is convenient, accessible, and suitable;

(b) comply with the minimum size and other requirements prescribed by the department of public health and human services; and

(c) comply with the statewide building regulations, if any, promulgated by the department of labor and industry.

History: En. 75-8203 by Sec. 475, Ch. 5, L. 1971; R.C.M. 1947, 75-8203; amd. Sec. 75, Ch. 575, L. 1981; amd. Sec. 1, Ch. 352, L. 1985; amd. Sec. 48, Ch. 418, L. 1995; amd. Sec. 67, Ch. 546, L. 1995; amd. Sec. 1, Ch. 79, L. 1997; amd. Sec. 1, Ch. 18, L. 1999; amd. Sec. 50, Ch. 483, L. 2001.

Provided by Montana Legislative Services

Attachment C

Montana Code Annotated 2011

20-6-104. Moratorium on creation of new district -- exceptions. (1) Except as provided in subsections (2) and (3), a school district may not initiate the creation of a new elementary district or a new high school district.

(2) Pursuant to the provisions of 20-6-326, the trustees or the electors of an existing elementary district may initiate the creation of a new high school district solely for the purpose of expanding into a K-12 district.

(3) The moratorium in subsection (1) does not apply to a district that results from the procedure for the dissolution of a K-12 school district pursuant to 20-6-704.

History: En. Sec. 56, Ch. 633, L. 1993; amd. Sec. 2, Ch. 285, L. 1995; amd. Sec. 15, Ch. 219, L. 1997; amd. Sec. 2, Ch. 194, L. 2007.

Appendix B

Schlenker McKittrick Architects, P.C. East Helena Public Schools Planning Report

East Helena Public Schools

School District No. 9

Planning Report

PO Box 1280 | East Helena, MT 59635

June 29, 2014

SMA ARCHITECTS

SCHLENKER & McKITTRICK ARCHITECTS, P.C.

SMA Project No. 1321

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Table of Contents

1

Problem Statement + Background

East Helena School District Mission |

"East Helena Public Schools in partnership with the parents and community will offer a secure place where students gain knowledge, grow in wisdom, develop confidence and value learning for life."

This mission is the guide to the District as it strives to serve over 1100 students each year in grades K through 8. The District is organized currently into three buildings according to their grade level. Eastgate School is the District's elementary building for kindergarten and first grade students, Radley educates the second through fifth grades and the newest building in the District, East Valley Middle School prepares another 350+ students for high school in grades sixth through eighth.

East Helena School District Motto |

"Success for All Students"

The District motto is key to the attitudes of the professionals that serve our students and our District has a great tradition of offering the students an excellent education. Students of all abilities are prepared for the future with a fundamental understanding of the three R's and also allowed to excel in computer technology, foreign language, advanced math, and arts and music. Though the District operates on a lean budget, students receive only the best from a dedicated staff of 70+ professionals, two thirds of which have earned a Masters degree or above. Robert H. Radley Elementary School was recognized as the only Blue Ribbon School in the State of Montana in the 2007 - 2008 school year by the U.S. Department of Education and continues to boast excellent achievement scores in reading and math. These test scores are indicative of the excellent education students receive in East Helena. Our staff also includes 3 Walmart Teachers of the Year, A Veterans of Foreign Wars Regional Teacher of the Year, a School Board Principal of the Year, and the 2007 Montana AHPERD Teacher of the Year. Through an understanding of the needs of all children and the commitment to Success for All Students, East Helena Public Schools offers the wonderful community of East Helena an outstanding education.

Problem Statement + Background

In an effort to prepare for the anticipated enrollment increases identified by East Helena Public Schools in their Long Term Infrastructure Handbook, the District contracted with Schlenker and McKittrick Architects , P.C. (SMA), in collaboration with Great West Engineering, to perform a study of the District's existing facilities and their ability to accommodate the expansion required to house the anticipated increase in student enrollment. This report will evaluate each of the District's existing facilities based on site size and characteristics, existing facility condition, existing building configuration, current grade levels housed and current enrollment in order to determine the feasibility of providing additional classroom and support spaces at each facility. East Helena Public Schools will use the information and recommendation provided in this report in their continued efforts to determine the best way to accommodate their anticipated enrollment increase; to provide additional classroom space at the Districts existing facilities or to provide a new school building on a new site.

The current and projected student enrollment at the District's existing facilities have reached the Trigger Points identified in the Long Term Infrastructure Handbook requiring the District to evaluate existing facility capacities, growth potential, future classroom needs and the construction of a new elementary school. As of the writing of this report, the current enrollment of East Helena Public Schools is 1,147 students with an anticipated Fall 2014 enrollment of 1,174. While student enrollments in the District remain fluid, the current enrollment numbers generally match or exceed the projected enrollment numbers reported by the Dodge Data Systems that are included in the Long Term Infrastructure Handbook. (See Figure 1 below) While the growth rate of student population has remained fairly stable over the last 2 to 3 years despite advances in affordable housing, the District must anticipate a resurgence in the new home construction within the District, particularly in the Mountain View Meadows Subdivision which has the potential to add 1,800 new homes.

As indicated in the following table (See Figure 2 below), the available classrooms at each of the District's current facilities are approaching their maximum capacities outlined in Section 10.55.712, Montana School Accreditation Standards and Procedures Manual. In some cases the addition of only a few students in a grade level would push enrollment beyond the maximum capacity. In addition to classrooms capacities, the common and support spaces at each existing school (gymnasium, cafeteria, computer labs, music rooms, etc.) must be evaluated in order to determine their capacity to serve increased enrollment.

A.R. M. Rule: 10.55.712 CLASS SIZE: ELEMENTARY

(1) In single grade rooms, the maximum class size shall be:
- (a) no more than 20 students in kindergarten and grades 1 and 2;
- (b) no more than 28 students in grades 3 and 4;
- (c) no more than 30 students in grades 5 through 8.

(2) In multigrade classrooms, the maximum class size shall be:
- (a) no more than 20 students in grades k, 1, 2, and 3;
- (b) no more than 24 students in grades 4, 5 and 6;
- (c) no more than 26 students in grades 7 and 8.

(3) Multigrade classrooms that cross grade level boundaries (e.g. 3-4, 6-7) shall use the maximum of the lower grade.

(4) In one-teacher schools, the maximum class size shall be 18 students.

(5) Instructional aides are mandatory when class size or teacher load exceed the standards. An instructional aide shall be assigned a minimum of 1 1/2 hours per day, per student overload up to six hours.

(6) An overload of five students per classroom is considered excessive.

The younger grade levels are of particular concern to the District. Based on the projected enrollment and the maximum classroom sizes outlined by the Department of Education, East Helena Public Schools will face the need for additional classroom spaces in the kindergarten through 3rd grade levels in the very near future.

The following document is an evaluation of the ability and appropriateness of each of East Helena Public Schools existing facilities for expansion in order accommodate the District's projected enrollment and provide the best educational opportunity for the students of East Helena.

Design Team

Throughout the documentation and evaluation process, Schlenker & McKittrick Architects [SMA] consulted with the District Superintendent, District Staff, School Board, and the design team listed below:

Owner

East Helena Public Schools
PO Box 1280
226 E. Clinton
East Helena, MT 59635

Superintendent |

Ron Whitmoyer

Board Trustees |

Ann Marie Thompson
Marcia Ellermeyer
Breck Scheet
Mark Diehl
Scott Walter
Kevin Bokovoy
Joe Nye

Architect

Schlenker & McKittrick Architects, P.C. [SMA]
50 South Last Chance Gulch, Suite 1
Helena, MT 59601
P | 406.442.4933 / F | 406.442.4936
www.architects-sma.com

Civil Engineer

Great West Engineering
2501 Belt Veiw Drive
PO Box 4817
Helena, MT 59604
P | 406.449.8627

Acknowledgements
Schlenker & McKittrick Architects [SMA] and the design team would like to thank the entire District Staff for their patience and accommodation during the preparation of this document.

Appendix L

Enrollment Projections – Helena School District #1 (Dodge Report)

Prepared November, 2005

Prepared by Dodge Data Systems
2905 N Montana Ave, Helena, MT 59601

The Dodge report was contracted by the Helena School District as an indicator of future growth using an "…enrollment grade-retention (cohort-survival) model based on district and county school enrollment information as reported by the Montana Office of Public Instruction and economic and demographic date published by the National Planning Association (NPA) and the U.S. Bureau of Census." The report uses a variety of birth and death rates as well migration data as prepared by various state and federal agencies to predict future changes in area populations.

The school enrollment projections as reported by Dodge Data Systems in a brief summary show the following projections for East Helena Schools in isolation from the Helena School District.

Sum K – 8 Enrollment

Year	Births	Enrollment
1995	99	1062
1996	109	1141
1997	108	1146
1998	117	1177
1999	120	1125
2000	120	1152
2001	114	1071
2002	110	1055
2003	111	1043
2004	113	1091
2005	121	1063
2006	*113*	*1070 **
2007	*113*	*1075 **
2008	*111*	*1087 ** See Current Enrollment*
2009	*118*	*1084 **
2010	*120*	*1095 **
2011	*121*	*1109 **
2012	*123*	*1114 **
2013	*124*	*1135 **
…	…	…

A complete copy of the Enrollment Projections – Helena School District #1 (Dodge Report) is available in the East Helena Public Schools Central Office.

Figure 1
Courtesy East Helena Public Schools - *"Long Term Infrastructure Handbook"*

Table 1: Student Enrollment and Classroom Capacity 2012/2013

	Grade	2012/2013 Student Enrollment*	Number of Classes*	Average Number of Students per Class	Maximum Capacity of Classrooms**
Eastgate School	K	135	7	19.3	20
	1	128	7	18.3	20
Radley School	2	133	7	19.0	20
	3	122	6	20.3	28
	4	135	5	27.0	28
	5	125	5	25.0	30
East Valley Middle School	6	131	6	21.8	30
	7	120	6	20.0	30
	8	131	6	21.8	30
Total		1160			

*Source: East Helena Elementary School District
**Source: Section 10.55.712, Montana School Accreditation Standards and Procedures Manual, July 1, 2013, Board of Public Education

School District enrollment for the 2012/2013 school year was 1,160 students. Projections for the 2013/2014 school year are 1,164 students and 1,179 students for the 2014/2015 school year (Source: East Helena Elementary School District). The *Long Term Infrastructure Handbook* states that when enrollment approaches 1,200 students, the Long Term Infrastructure Planning Committee will meet to discuss constructing a new facility to accommodate student population growth. Because student enrollment is approaching the 1,200 trigger point that will lead to overcrowding and negative impacts to public health and safety, the School District is planning to construct a new school.

Figure 2

Courtesy East Helena Public Schools - *"Quality Schools Grant Program Planning Grant Application 2015 Biennium"*

2

Evaluation Criteria

Evaluation Criteria

For the purpose of this report, the following criteria will be utilized to evaluate each of East Helena Public Schools existing facilities. Many of the criteria below are nationally accepted rules of thumb, recognized school design best practices or proven standards of East Helena Public Schools.

Existing Site Evaluation:

Each existing site will be evaluated based on its size, configuration, parking and traffic flow to determine its ability to accommodate additional classroom expansion. Student safety is of primary concern when evaluating the size and traffic flows of site, particularly during pick-up and drop-off. Per "Educational Facilities: Planning, Modernization and Management" Fourth Addition © 1994Allyn Bacon by Basil Castaldi, the suggested size for an elementary school site is 10 acres plus 1 acre for every 100 students. The Council of Educational Planners International in "School Site Size – How Many Acres Are necessary? © September 2003, indicates that the following formulas are used by many states to determine the size of school sites: Elementary Schools = 10 acres plus 1 acre for every 100 students; Middle Schools = 20 acres plus 1 acre for every 100 students. These accepted standards will be used as a basis for evaluation of size of the existing facility sites.

Existing Building Condition:

The condition of each of the three existing buildings will be evaluated in order to determine the capacity of the structure to facilitate a new addition. The construction type, age, integrity, code compliance and general condition of each building will be evaluated.

Building Configuration:

The configuration of each building will be evaluated to determine the feasibility of providing an addition to the existing structure. The relationship to the classroom wings to each other and adjacent support spaces will be assessed in order to determine if a classroom addition can be constructed in an efficient manner.

Utilities/infrastructure:

The capacity of existing utilities on each site, including electrical power, domestic and fire protection water service, sewer, and natural gas would need further investigation to determine if they have the capacity to handle the additional loads required by any proposed school additions. While a preliminary analysis has been conducted for each school, there are a number of factors that would drive the potential impacts to building utility and infrastructure. Some of these factors include the proposed building addition size, number of new students served, existing fire flows (city water flow per minute), etc.

School Size:

Studies have shown that the size of an elementary school has a direct correspondence to student success. East Helena Public Schools is committed to providing the best learning environment possible for student by ensuring that their school facilities are sized properly. According to. "School Size, School Climate and Student Performance", NWREL School Improvement Research Series, Close Up #2, © May 1996 by Kathleen Cotton, on average, research indicates that an effective size for an elementary school is in the range of 300-400 students. Furthermore, "Educational Facilities: Planning, Modernization and Management" Fourth Addition © 1994 Allyn Bacon by Basil Castaldi, indicates that the recommended minimum enrollment size for an elementary school is 200 students and the maximum enrollment size is between 600 and 650 students. These recognized recommendations will be utilized to evaluate the existing school sizes and their ability to absorb additional enrollment.

Grade Level Schools:

In order to improve the efficiency of District resources, save money and increase academic success, East Helena

Public schools has made a commitment to Grade level Schools. The District has seen the benefits of this decision through higher test scores. (See figure 3 below). The size and configuration of classrooms and support spaces within each existing facility will be evaluated to determine if a classroom addition would allow for even distribution of students within each grade level, and support the District's commitment to Grade Level Schools. ■

East Helena Public Schools										
State Level MontCAS Test Scores										
Proficient and Advanced Percentages										
			EHPS/State AVE							
	Reading									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
3rd Grade			84	88	85/84	89/85	94/85	100/85	97/84	96/85
4th Grade	64	78	80	86	88/79	79/81	94/83	94/83	94/86	93/83
5th Grade			82	86	87/82	85/84	88/86	95/87	93/88	96/86
6th Grade			81	89	86/84	90/85	89/87	85/87	92/89	93/87
7th Grade			77	84	75/84	84/83	87/85	95/86	91/89	88/84
8th Grade	51	51	69	76	82/82	71/82	93/84	89/85	93/88	86/84

East Helena Public Schools										
State Level MontCAS Test Scores										
Proficient and Advanced Percentages										
			EHPS/State AVE							
	Math									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
3rd Grade			71	74	68/63	73/68	79/69	86/70	92/72	88/70
4th Grade	32	41	77	76	77/67	64/67	79/69	86/70	87/69	89/68
5th Grade			71	86	78/68	76/67	79/71	89/73	86/74	88/70
6th Grade			72	73	79/64	68/65	75/68	74/67	81/69	79/65
7th Grade			61	65	66/67	71/66	78/68	74/70	75/68	78/70
8th Grade	60	60	41	55	59/60	53/61	70/67	67/66	80/66	68/63

East Helena Public Schools								
State Level MontCAS Test Scores								
Proficient and Advanced Percentages								
			EHPS/State AVE					
	Science							
	2004	2005	2006	2007	2008	2009	2010	2011
3rd Grade								
4th Grade							78/67	68/62
5th Grade								
6th Grade								
7th Grade								
8th Grade							71/62	76/65

Figure 3

Test Score Information provided by East Helena Public Schools Superintendent Ron Whitmoyer

3

Existing Facility Evaluation

Existing Facility Evaluation

Eastgate Elementary School |

Eastgate Elementary School was originally constructed in 1986 as an approximately 31,000 s.f. facility. An approximately 13,350 s.f. classroom and gymnasium addition to the building was built in 1998. The building is a one story structure. Eastgate Elementary School houses 261 Kindergarten through first grade students and an additional 40 preschool students from the East Helena Branch of Headstart. The school is home to 21 teaching and 11 instructional support staff, currently occupying 17 classrooms, a multipurpose cafeteria gymnasium, a gymnasium, a special education classroom, a teacher's room, a computer lab, a library and a music classroom.

Enrollment and Distribution:

Preschool: 40 students in 2 classrooms (20 students per classroom)
Kindergarten: 132 students in 7 classrooms (18.9 students per classroom)
First Grade: 129 students in 8 classrooms (16.1 students per classroom)

Total: 301 Students

Existing Site Evaluation:

Eastgate School sits on a 6.56 acre site. The District also owns an adjacent 2.954 acre lot that houses the District's Bus Barn. The existing Eastgate Elementary site is significantly smaller than the 13 acres recommended using the guidelines for elementary school site size outlined previously in this report. Even if the District were to incorporate part of the adjacent lot that houses the Districts Bus Barn, the site would still be two and one half acres smaller than recommended. Adding additional building square footage and student enrollment by building an addition to Eastgate School would only exacerbate the existing site constraints.

The building is oriented east-west on the site with the main parking and playground area to the south and additional staff parking to the north. Parking lot size is inadequate for the student population and the configuration of parking is inefficient leading to unsafe conditions at drop-off and pickup. The arrangement of the building, parking and playground area on the site do not allow space for an addition to be built. (See Figure 4 Below)

Existing Building Condition Evaluation:

Overall, the building is in good condition for its age. Both the original building and addition are concrete masonry unit (CMU) bearing walls with masonry veneer exterior walls and CMU and metal stud interior walls. A cursory visual inspection of the masonry bearing wall systems revealed no concerns. The building is heated with a radiant, hydronic system. The existing boilers are older and not as efficient as the boilers at other facilities. Depending on the size and location of a proposed addition, the existing boilers may not have the capacity to provide heating to the addition. The existing building does not have a fire suppression sprinkler system. If an addition were built, both the addition and existing building would need to be equipped with an automatic fire sprinkler throughout. Depending on the size and configuration of a proposed addition, the construction type, allowable building area and required exiting would need to be evaluated to determine if they meet current code requirements.

Existing Building Configuration Evaluation:

The original building consisted of a central administrative and multipurpose room core flanked by classroom wings to the east and west. The building addition extended the east classroom wing by 6 classrooms terminated

Figure 4

Eastgate Elementary Aerial View

by a gymnasium addition at the east end. Due to the configuration of the building and its location on the site, there is no opportunity to expand either of the existing classroom wings. Adding additional classroom space, and the associated increase in students and staff, would stress the common/support spaces in the building and would require the construction of additional support/common spaces to be considered.

Utility and Infrastructure Evaluation:

According to original school drawings prepared by E.F. Link and Associated which were located in SMA's drawing vault, there is an existing 2.5" water line serving the building. This water line comes from the main water line in Lake Helena Drive to the west of the school and enters the school on the west side. If a new addition were planned, a new 4" to 6" water service would need to be installed to the building to handle future fire suppressions system flows.

According to the original drawings, there appears to be a 6" sanitary sewer line entering the building from Lake Helena Drive to the west side of the school. At this time, the design team feels an additional sanitary sewer service would only be required if there is a long distance between existing sewer plumbing and any possible new addition plumbing. The 6" sewer service, if sloped correctly has a relatively high capacity.

School Size Evaluation:

The current student population of 301 at Eastgate School would accommodate additional expansion and still be within the recommended elementary school size of 300 – 400 students and below the maximum recommended size of 600 – 650 students. However the site limitations make expansion impractical if not impossible.

Grade Level School Evaluation:

Eastgate Elementary School currently serves the District's preschool, kindergarten and 1st grade students. While the current enrollment at the school is supported by the number of classrooms, only a small increase in enrollment per grade could increase the student per classroom numbers beyond the maximum capacities outlined in Section 10.55.712, Montana School Accreditation Standards and Procedures Manual.

Robert H. Radley Elementary School |

Robert H. Radley Elementary School was constructed in two phases. The original building (east Wing) was built in 1963 and the addition (West Wing), including the gymnasium was built in 1978. The total building area is approximately 67,900 s.f. It is a one story structure with a full basement with classrooms on each level, gymnasium on the first floor and cafeteria/kitchen in the basement below the gym. Radley School houses 507 students 2nd through 5th grade students. The school is home to 30 teaching and 16 instructional support staff that are organized in 23 second through fifth grade classrooms, a Title I room, a reading tutor room, a special education room, a single student self-contained room, a music/band room, two computer labs, a conference room, a gymnasium a cafeteria, the District kitchen, the central supply room, a library, a small teacher's room and a storage room.

Enrollment and Distribution:

2nd Grade: 134 students in 7 classrooms (19.1 students per classroom)

3rd Grade: 127 students in 6 classrooms (21.2 students per classroom)

4th Grade: 123 students in 5 classrooms (24.6 students per classroom)

5th Grade: 123 students in 5 classrooms (24.6 students per classroom)

Total: 507 Students

Existing Site Evaluation:

Radley School sits on a 9.662 acre site shared with the District Administration building. The site is smaller than the 15 acres recommended using the guidelines for elementary school site size outlined previously in this report. The classrooms of the building are oriented east west with the gymnasium/cafeteria wing extending to the north. The building is flanked by parking to the south and west with the playground area and running

Gym/ Cafeteria Wing

Utility Service Location

9.662 Acre Site

Figure 5

Radley Elementary Aerial View

track to the north. Parking on the site is inadequate for the student population served and causes congestion at drop-off and pick-up. The north wing basement (cafeteria/kitchen) experiences regular flooding due to high water table, poor site grading and inadequate drainage. The orientation of the classroom wings on the site does not allow for additions to the wings at either the east or west. The location of the parking lot to the south and utility services to the north of the building limit the potential for additional classrooms being added to the building without significant reconfiguration to the site. (See Figure 5 Below)

Existing Building Condition Evaluation:

Overall the building condition is good for its age. Both the original building and addition are a combination of concrete and concrete masonry unit (CMU) bearing walls with masonry veneer exterior walls and CMU and metal stud interior walls. A cursory visual inspection of the building revealed no structural concerns. The East Wing was built to serve as a fallout shelter and has 12 – 16 inch thick reinforced concrete walls. Openings were cut into the concrete walls so classroom windows could be added to the structure in the late 1980's. While efficient operationally, the existing boilers are older and have been discontinued making finding replacement parts and maintenance difficult. Depending on the size and location of a proposed addition, the existing boilers may not have the capacity to provide heating to the addition. The building does not have a fire suppression sprinkler system except for the basement of the east wing. If an addition were built, both the addition and existing building would need to be equipped with an automatic fire sprinkler throughout. Depending on the size and configuration of a proposed addition, the construction type, allowable building area and required exiting would need to be evaluated to determine if they meet current code requirements.

Existing Building Configuration Evaluation:

Radley Elementary School is configured with the classroom wings oriented east-west and the kitchen/cafeteria/gymnasium wing extending to the north. Due to the configuration of the building and its location on the site, there is no opportunity to expand either of the existing classroom wings. Furthermore, the fact that the existing building has a basement that houses classrooms requiring proper egress further complicates providing and addition to the building. Adding additional classroom space, and the associated increase in students and staff, would stress the common/support spaces in the building and would require the construction of additional support/common spaces to be considered.

Utility and Infrastructure Evaluation:

Although the design team was unable to find existing school drawings for utility information, the school maintenance department was able to provide the following information regarding utilities and infrastructure. The existing building has a 3" line serving the building for domestic water supply and a 4" line serving the building for fire suppression. Contingent upon proposed building addition size and existing water flows, there is the possibility that a 6" fire suppression service line would need to be installed from the water main to the school.

The existing school is currently served by a 6" sanitary service line. At this time, the design team feels that if the existing line is correctly sloped, it should continue to serve the building well, including a new addition. If new plumbing fixtures were located too far from the existing sanitary sewer outlets, there is the possibility a new line would be required.

School Size Evaluation:

Radley School's student population currently exceeds the recommended effective size for an elementary school of 300 – 400 students and is approaching the recommended maximum enrollment size of 600 - 650. Any proposed addition to Radley School would push it population above these recommended values.

Grade Level School Evaluation:

Radley Elementary School currently serves the District's 2nd, 3rd , 4th and 5th grade students. While the current enrollment at the school is supported by the number of classrooms, only a small increase in enrollment per grade, particularly at the 2nd grade level, could increase the student per classroom numbers beyond the maximum capacities outlined in Section 10.55.712, Montana School Accreditation Standards and Procedures Manual.

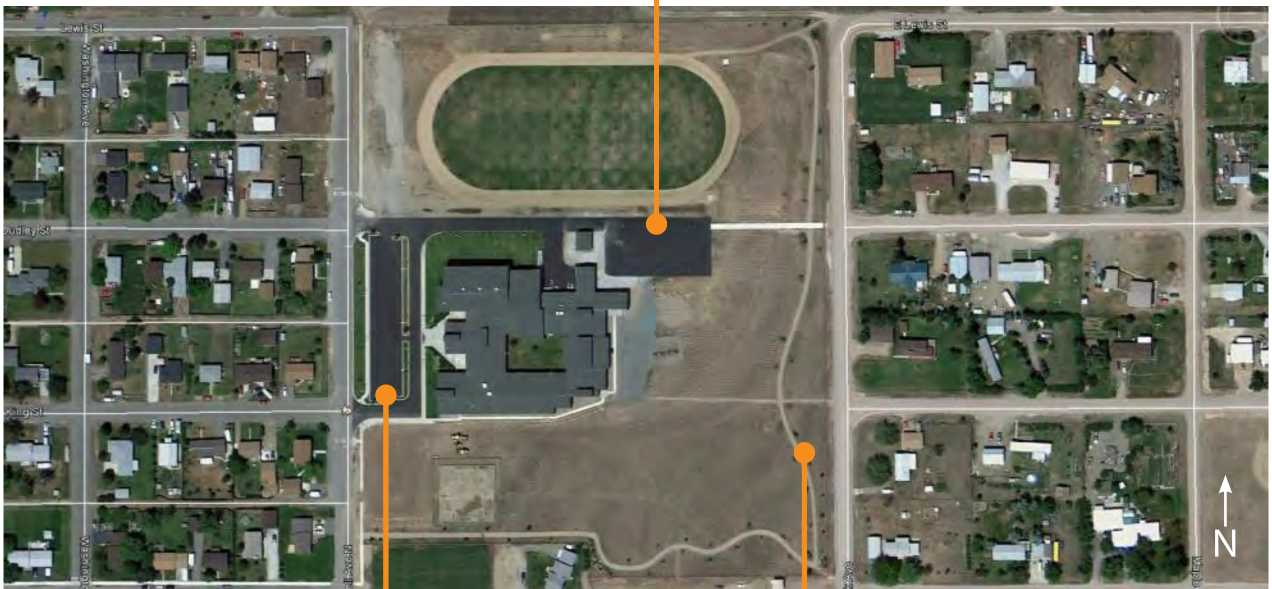


Figure 6
East Valley Middle School Aerial View

East Valley Middle School |

East Valley Middle School was constructed in 1998 as a 61,980 s.f. single story structure. East Valley Middle School is home to 379 6th, 7th and 8th grade students and 35 staff that are organized into a series of grade level teams and specialty teaches for the 6th, 7th, and 8th grade levels. The building houses three single grade level teams composed of four teachers that specialize in mathematics, science, communication arts and social studies at each grade level for a total of 12 classrooms. In addition, to the 12 core curriculum area classrooms, there is a Title I room, a music room, a band room, two computer labs, an art room (including a dark room and kiln room) a shop/practical arts room, a small computer assisted drafting and computer art lab, a small conference room, a gymnasium, a cafeteria, a library, a home economics room, a four office area special education room, 3 teaming rooms, a health enhancement room and a science lab.

Enrollment and Distribution:

6th Grade: 133 students in 6 classrooms (22.2 students per classroom)
7th Grade: 138 students in 6 classrooms (23 students per classroom)
8th Grade: 108 students in 6 classrooms (18 students per classroom)

Total: 379 Students

Existing Site Evaluation:

East Valley Middle School sits on a 19.22 acre site. The current site size falls within the recommended size for elementary schools, but falls below the recommended 24 acres recommended for a middle school site. The building is situated on the site with the main paved parking area to the west with additional gravel parking areas to the north and south of the paved parking along Kalispell Ave. North of the building there is a running track and asphalt court area. To the east and south of the building there is open space with a trail system. The site does provide potential space for a building addition to the east and south, however a building addition and the corresponding increase in enrollment would further increase the disparity between the size of the site and the recommended minimum site size for a middle school. (See Figure 6 Below)

Existing Building Condition Evaluation:

East Valley Middle School is the newest school facility in the District and is in good condition. The existing structure is a combination of Concrete Masonry Unit (CMU) and wood stud exterior bearing walls with wood truss and steel joist roof system. A cursory visual inspection of the building revealed no structural concerns. The building is equipped throughout with an automatic fire sprinkler system. While the building's mechanical systems are the newest in the District, it was noted that they do require more maintenance time than the other facilities. Depending on the size and configuration of a proposed addition, the construction type, allowable building area and required exiting would need to be evaluated to determine if they meet current code requirements.

Existing Building Configuration Evaluation:

The existing building is configured with four wings surrounding a central court. The main entry and administration forms the west wing of the building with the gymnasium, cafeteria and mechanical support spaces forming the north wing. The library and classrooms form the south and east wings of the building. While the site offers room for expansion, the configuration of the wings around the central court meeting at right angles would make positioning a new addition awkward and inefficient. Due to the building's configuration and location on the site, and proposed addition would need to extend to the south and/or east of the building. Adding additional classroom space, and the associated increase in students and staff, would stress the common/support spaces in the building and would require the construction of additional support/ common spaces to be considered.

Utility and Infrastructure Evaluation:

East Valley Middle School was originally designed by SMA and the following information was verified with as-built construction documents. The existing school is served by an 8" water line that is necked down to a 6" line entering the school. The water line connects to the water main in Kalispell Avenue and runs parallel to the north side of the school before turning into a valve box on the north side of the school near the school's 'mid point'. Therefore, any proposed additions to the north side of the school would require the removal and relocation of this main water service line. The design team is of the opinion that any significant additions to East Valley Middle School a new 4" to 6" water supply should be assumed for fire suppression. Again, this requirement is contingent on the scale of an addition and existing city water flows at the school.

The existing sanitary sewer line is a 6" line that runs directly below the main entry door out into Kalispell Avenue. An additional sewer line would only be required if there is a long distance between existing sewer plumbing and any possible new addition plumbing. If the 6" seer service is sloped correctly, it has a relatively high capacity.

School Size Evaluation:

East Valley Middle School's current student population of 379 falls within the recommended effective size of 300 – 400 students, and would allow for additional students before approaching the recommended maximum enrollment size of 600 – 650 students.

Grade level School Evaluation:

East Valley Middle School currently serves the District's 6th, 7th and 8th grade students. As noted above, the size of the school would accommodate future growth, but based on the District's commitment to grade level schools and the size and configuration of the support spaces within the school, an addition to EVMS would best serve the current 6th, 7th and 8th grade levels housed in the building. East Helena School District's commitment to grade level schools, and the proven academic success that they have provided, would make redistribution of students to EVMS from Radley or Eastgate Schools impractical if an addition were provided. ■

4

Conclusion + Recommendations

Conclusions + Recommendations

Eastgate Elementary School

While the student population at Eastgate would allow for a classroom addition and still fall within the recommended school size, the size of the site and configuration of the existing building would make an efficient, cost effective classroom addition impractical. Due to the site constraints and building configuration it is not recommended that an addition be provided at Eastgate Elementary School.

Robert H. Radley Elementary School

Radley Elementary School has the highest student population of any facility within the District. A classroom addition to Radley Elementary School would increase the school's population beyond the recommended maximum size for an elementary school. In addition, the size of the site and configuration of the existing building would make an efficient, cost effective addition to the existing building impractical. Due to the size of Radley school and the constraints of the site, it is not recommended that an addition be provided at Radley Elementary School.

East Valley Middle School

East Valley middle School is the District's newest school facility and offers the most potential for a classroom addition. However, a new classroom addition to East Valley Middle school would push the student population above the recommended effective school size of 300 – 400 students but still below the recommended maximum population of 600 – 650 students. While the East Valley Middle School site is more generous than either Eastgate Elementary or Radley Elementary, it is still below the recommended size for a middle school site. The configuration of the building and its placement on the site would limit the location, size and configuration of an addition. Based on the factors above and East Helena Public Schools commitment to Grade level Schools, it is recommended that an addition to EVMS only be provided if it serves the current 6th, 7th and 8th grade population.

District Wide Recommendations

The current and projected enrollments for East Helena Public Schools have reached the trigger points outlined in the Long Term Infrastructure Handbook that require the District to evaluate their existing facilities capability to handle the projected student populations. Based on the projected enrollment and maximum classroom sized dictated by the Montana Department of Education, the District's greatest needs in the near future will be at the kindergarten through 3rd grade levels.

The preceding evaluation of each of the District's existing facilities outline the opportunities and limitations of those facilities to meet the projected enrolment needs. Per the conclusions for each of the existing school facilities outlined above, none of the existing facilities provides an opportunity for an addition that will satisfactorily meet the District's most pressing enrollment needs: Eastgate and Radley Elementary Schools have restricted sites that do not allow for a classroom addition. Radley Elementary School's current population of 507 students is beyond the recommended school size of 300 – 400 students and an addition would push the enrollment near the maximum recommended size of 600 to 650 students. East Valley Middle School provides the most opportunity for an addition, but the building configuration and East Helena Public School's commitment to Grade Level Schools do not create a suitable situation for an addition serving the District's greatest need in the kindergarten to 3rd grade levels.

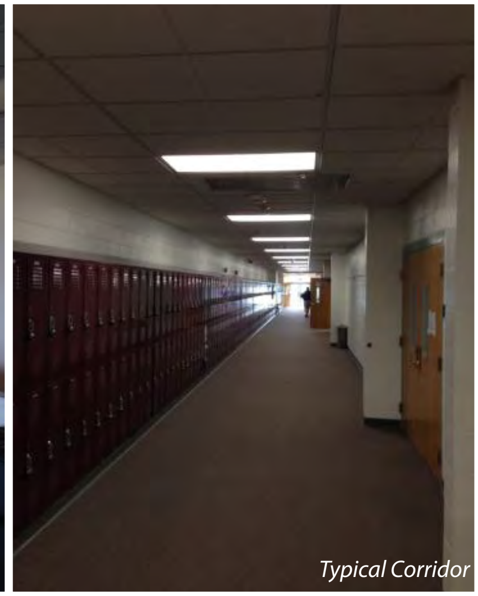
Due to the inability of the District's existing facilities to accommodate an effective classroom addition to facilitate the District's projected enrollment needs, it the our recommendation that the District pursue the construction of a new school facility on a new site. A new school on a new site would provide the greatest opportunity for the District to address their projected enrollment needs in an efficient, cost effective manner and support the District's commitment to Grade Level Schools. ■

5

Appendix
Existing School Photographs

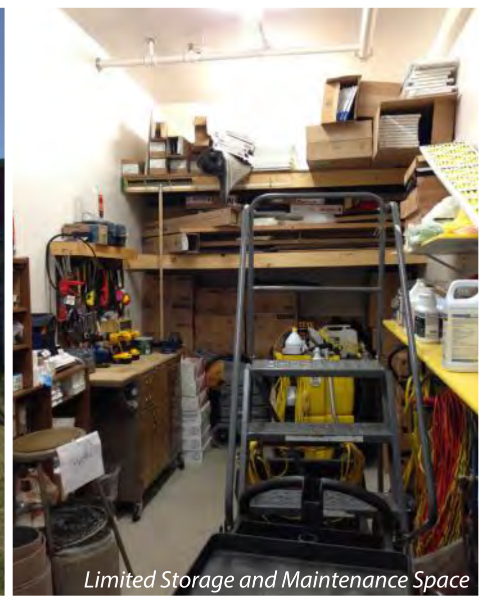
East Valley Middle School

Existing Caffeteria

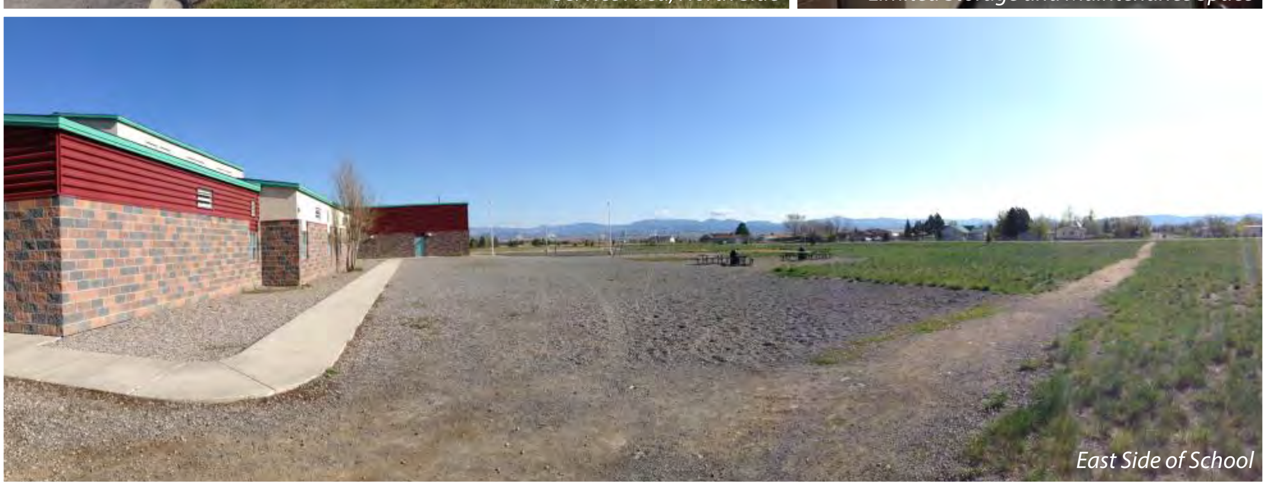


Typical Corridor

Service Area, North Side



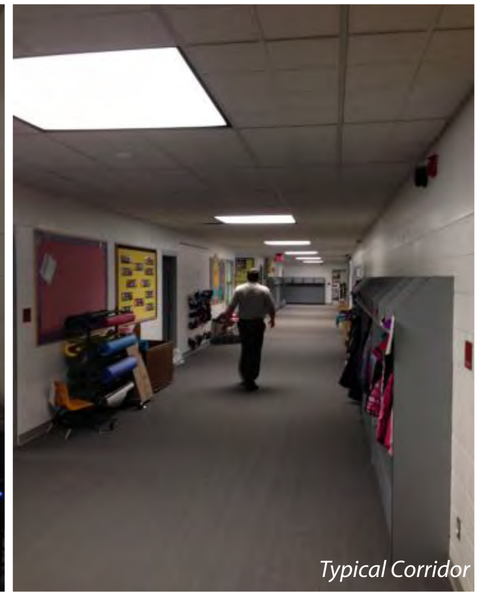
Limited Storage and Maintenance Space



East Side of School

Eastgate Elementary School

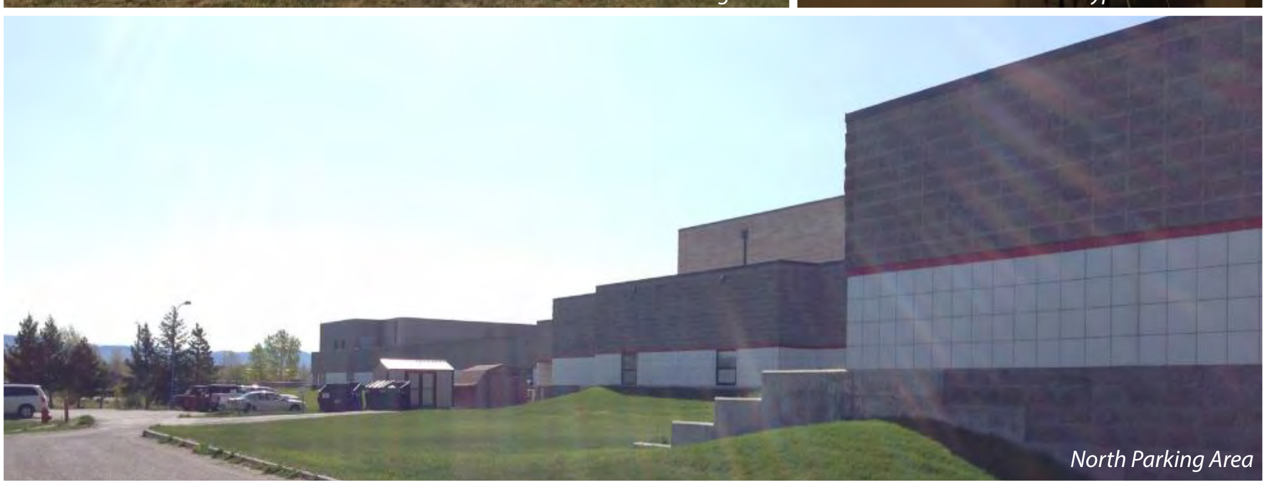
Existing Computer Lab



Typical Corridor

Main Parking Area

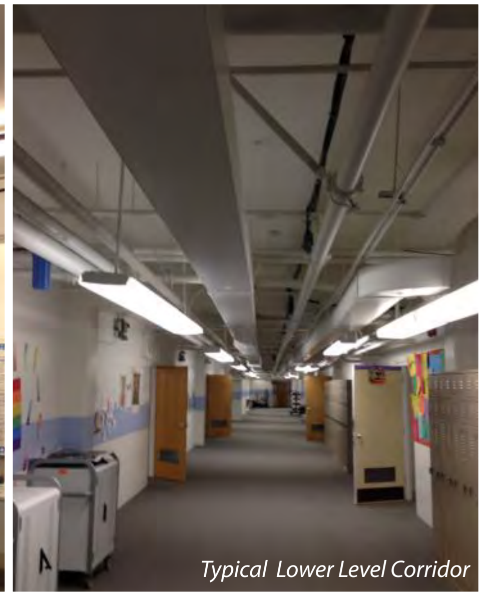
Typical Classroom



North Parking Area

Robert H. Radley Elementary School

Existing Lower Level Computer Lab



Typical Lower Level Corridor

Service Area, Northeast Side

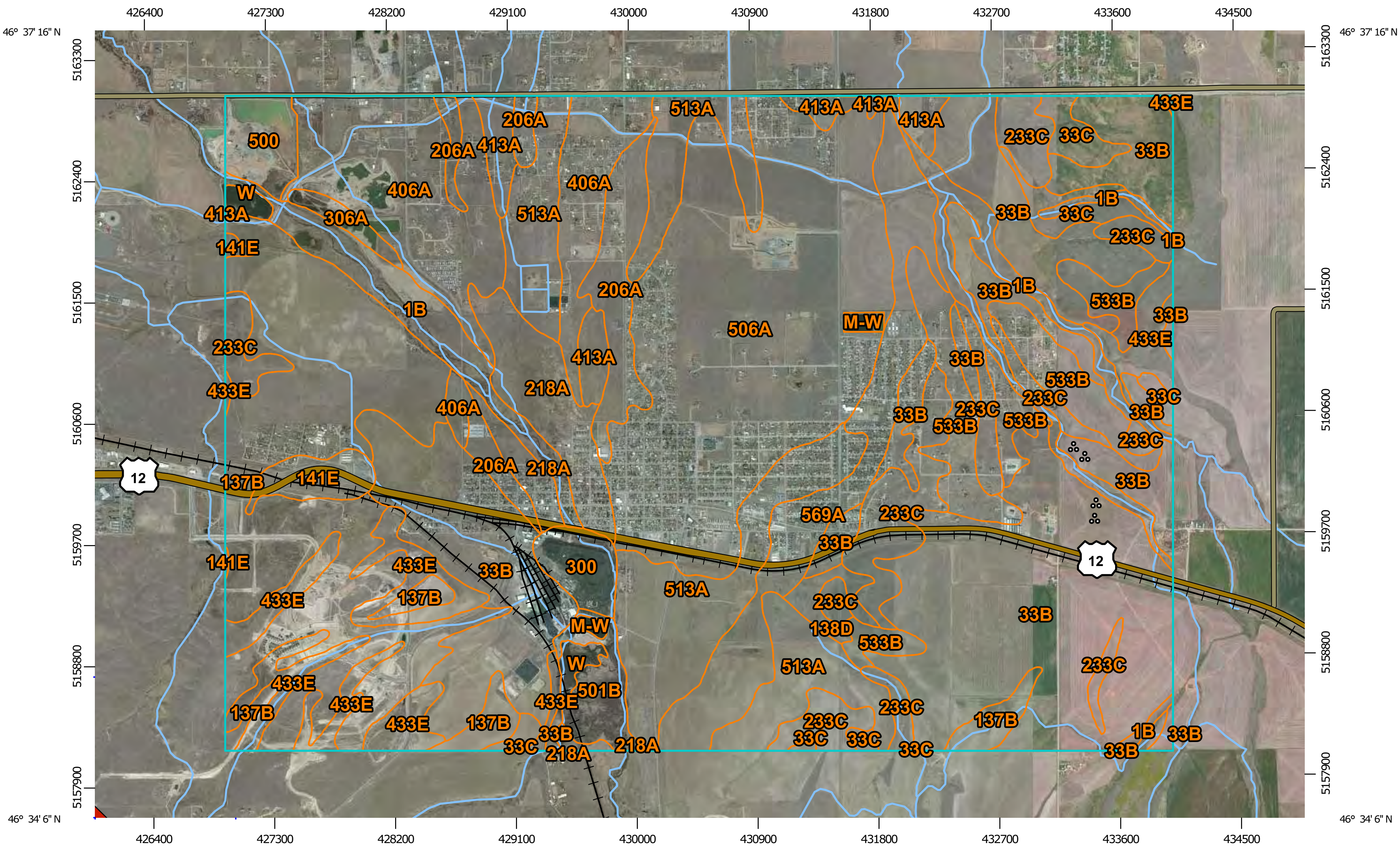
Aging Boilers

East + North Side of School

end of report

Appendix C
Soils Maps

Soil Map—Lewis and Clark County Area, Montana
(East Helena School Site Alternatives)



111° 57' 57" W

111° 50' 54" W

Map Scale: 1:41,200 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 500 1000 2000 3000

Feet: 0 2000 4000 8000 12000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 12N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL: http://websoilsurvey.nrcs.usda.gov
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 26, 2010—Apr 3, 2012

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Lewis and Clark County Area, Montana (MT630)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
1B	Aridic Ustifluvents, channeled, 0 to 4 percent slopes	353.0	4.1%
33B	Sappington-Amesha loams, 1 to 4 percent slopes	1,879.4	22.1%
33C	Sappington-Amesha loams, 4 to 8 percent slopes	133.0	1.6%
137B	Musselshell-Crago complex, 2 to 8 percent slopes	1,046.9	12.3%
138D	Crittenden-Tolman complex, 4 to 35 percent slopes	39.1	0.5%
141E	Crago-Pensore channery loams, 15 to 45 percent slopes	72.3	0.8%
206A	Nippt very cobbly loam, 0 to 4 percent slopes	226.3	2.7%
218A	Meadowcreek-Fairway complex, 0 to 2 percent slopes	235.6	2.8%
233C	Geohrock-Crago very cobbly loams, 2 to 8 percent slopes	451.1	5.3%
300	Dumps, mine	72.5	0.9%
306A	Nippt-Attewan-Beaverell complex, 0 to 4 percent slopes	31.4	0.4%
406A	Nippt gravelly loam, 0 to 2 percent slopes	599.6	7.0%
413A	Attewan loam, 0 to 2 percent slopes	126.9	1.5%
433E	Crago-Musselshell gravelly loams, 4 to 35 percent slopes	340.6	4.0%
500	Pits, gravel	86.6	1.0%
501B	Fluvaquents and Fluvaquentic Haplustolls soils, 0 to 4 percent slopes	83.4	1.0%
506A	Nippt-Attewan complex, 0 to 2 percent slopes	1,213.0	14.3%
513A	Attewan-Nippt complex, 0 to 2 percent slopes	744.0	8.7%
533B	Sappington-Musselshell gravelly loams, 2 to 8 percent slopes	348.5	4.1%
569A	Yamacall-Attewan loams, 0 to 2 percent slopes	373.7	4.4%
M-W	Miscellaneous water	17.2	0.2%

Lewis and Clark County Area, Montana (MT630)			
Map Unit Symbol	**Map Unit Name**	**Acres in AOI**	**Percent of AOI**
W	Water	37.3	0.4%
Totals for Area of Interest		**8,511.6**	**100.0%**

Lewis and Clark County Area, Montana

1B—Aridic Ustifluvents, channeled, 0 to 4 percent slopes

Map Unit Setting

Elevation: 3,500 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 90 to 120 days

Map Unit Composition

Aridic ustifluvents, channeled, and similar soils: 90 percent
Minor components: 10 percent

Description of Aridic Ustifluvents, Channeled

Setting

Landform: Flood-plain steps, drainageways, flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 5 inches: loam
C1 - 5 to 25 inches: stratified gravelly sandy loam to loam
2C2 - 25 to 60 inches: extremely gravelly loamy sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Occasional
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 4.0 mmhos/cm)
Available water storage in profile: Low (about 4.2 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Minor Components

Ryell

Percent of map unit: 4 percent
Landform: Flood-plain steps, drainageways, flood plains

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Rivra

Percent of map unit: 4 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Fairway

Percent of map unit: 2 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

33B—Sappington-Amesha loams, 1 to 4 percent slopes

Map Unit Setting

Elevation: 3,800 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Sappington and similar soils: 60 percent
Amesha and similar soils: 35 percent
Minor components: 5 percent

Description of Sappington

Setting

Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 6 inches: clay loam
Btk - 6 to 9 inches: loam
Bk1 - 9 to 20 inches: loam
Bk2 - 20 to 60 inches: loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Description of Amesha

Setting

Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium; gravelly colluvium

Typical profile

A - 0 to 4 inches: loam
Bk - 4 to 32 inches: loam
BC - 32 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 1 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Farmland classification: Prime farmland if irrigated
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Minor Components

Sappington, greater slope

Percent of map unit: 3 percent
Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Musselshell

Percent of map unit: 2 percent
Landform: Plains, alluvial fans, hillsides
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

33C—Sappington-Amesha loams, 4 to 8 percent slopes

Map Unit Setting

Elevation: 3,800 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Sappington and similar soils: 50 percent
Amesha and similar soils: 40 percent
Minor components: 10 percent

Description of Sappington

Setting

Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 6 inches: clay loam
Btk - 6 to 9 inches: loam
Bk1 - 9 to 20 inches: loam
Bk2 - 20 to 60 inches: loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Description of Amesha

Setting

Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium; gravelly colluvium

Typical profile

A - 0 to 4 inches: loam
Bk - 4 to 32 inches: loam
BC - 32 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 35 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: High (about 9.1 inches)

Interpretive groups

Farmland classification: Farmland of statewide importance
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Minor Components

Amesha, greater slope

Percent of map unit: 4 percent
Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Sappington, gravelly

Percent of map unit: 4 percent
Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Crago

Percent of map unit: 2 percent

Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

137B—Musselshell-Crago complex, 2 to 8 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Musselshell and similar soils: 70 percent
Crago and similar soils: 25 percent
Minor components: 5 percent

Description of Musselshell

Setting

Landform: Plains, alluvial fans, hillsides
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium derived from limestone; coarse-loamy slope alluvium derived from limestone

Typical profile

A - 0 to 4 inches: loam
Bk1 - 4 to 34 inches: gravelly loam
Bk2 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.6 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Description of Crago

Setting

Landform: Plains, alluvial fans, hillsides, escarpments

Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from limestone; gravelly colluvium derived from limestone; gravelly slope alluvium derived from limestone

Typical profile

A - 0 to 4 inches: gravelly loam
Bk1 - 4 to 32 inches: very gravelly clay loam
Bk2 - 32 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 70 percent
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Minor Components

Amesha

Percent of map unit: 2 percent
Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Crago, cobbly

Percent of map unit: 2 percent
Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Delpoint

Percent of map unit: 1 percent
Landform: Knolls, hills, escarpments
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Silty (Si) RRU 46-N 10-14" p.z. (R046XN236MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

206A—Nippt very cobbly loam, 0 to 4 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 39 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Nippt and similar soils: 95 percent
Minor components: 5 percent

Description of Nippt

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium over sandy and gravelly alluvium

Typical profile

E - 0 to 3 inches: very cobbly loam
Bt - 3 to 9 inches: very cobbly clay loam
Bk1 - 9 to 15 inches: very cobbly sandy loam
2Bk2 - 15 to 60 inches: extremely cobbly sand

Properties and qualities

Slope: 0 to 4 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Minor Components

Nippt

Percent of map unit: 3 percent
Landform: Stream terraces
Down-slope shape: Linear

Across-slope shape: Linear
Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Nippt

Percent of map unit: 2 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

233C—Geohrock-Crago very cobbly loams, 2 to 8 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,300 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Geohrock and similar soils: 60 percent
Crago and similar soils: 30 percent
Minor components: 10 percent

Description of Geohrock

Setting

Landform: Alluvial fans, valley floors, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium; gravelly slope alluvium

Typical profile

A - 0 to 4 inches: very cobbly loam
Bt - 4 to 10 inches: very gravelly clay loam
Btk - 10 to 18 inches: very gravelly loam
Bk - 18 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 3.5 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Silty-Droughty (SiDr) 10-14" p.z. (R044XC456MT)

Description of Crago

Setting

Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from limestone; gravelly colluvium derived from limestone; gravelly slope alluvium derived from limestone

Typical profile

A - 0 to 4 inches: very cobbly loam
Bk1 - 4 to 32 inches: very cobbly clay loam
Bk2 - 32 to 60 inches: extremely cobbly sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 70 percent
Available water storage in profile: Low (about 4.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Silty-Stony (SiSt) 10-14" p.z. (R044XC458MT)

Minor Components

Nippt

Percent of map unit: 5 percent
Landform: Flood-plain steps, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Geohrock, greater slope

Percent of map unit: 5 percent
Landform: Alluvial fans, valley floors, terraces
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Silty-Droughty (SiDr) 10-14" p.z. (R044XC456MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

406A—Nippt gravelly loam, 0 to 2 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Nippt and similar soils: 95 percent
Minor components: 5 percent

Description of Nippt

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium over sandy and gravelly alluvium

Typical profile

E - 0 to 3 inches: gravelly loam
Bt - 3 to 9 inches: very gravelly clay loam
Bk1 - 9 to 15 inches: very gravelly sandy loam
2Bk2 - 15 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Minor Components

Scravo

Percent of map unit: 2 percent
Landform: Stream terraces

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Thess

Percent of map unit: 2 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Nippt, greater slope

Percent of map unit: 1 percent
Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

433E—Crago-Musselshell gravelly loams, 4 to 35 percent slopes

Map Unit Setting

Elevation: 3,600 to 5,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Crago and similar soils: 50 percent
Musselshell and similar soils: 40 percent
Minor components: 10 percent

Description of Crago

Setting

Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium derived from limestone; gravelly colluvium derived from limestone; gravelly slope alluvium derived from limestone

Typical profile

A - 0 to 4 inches: gravelly loam
Bk1 - 4 to 32 inches: very gravelly clay loam
Bk2 - 32 to 60 inches: extremely gravelly loam

Properties and qualities

Slope: 4 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 70 percent
Available water storage in profile: Low (about 3.8 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Description of Musselshell

Setting

Landform: Plains, alluvial fans, hillsides
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium derived from limestone; coarse-loamy slope alluvium derived from limestone

Typical profile

A - 0 to 4 inches: gravelly loam
Bk1 - 4 to 34 inches: gravelly loam
Bk2 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 4 to 35 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Minor Components

Amesha

Percent of map unit: 3 percent
Landform: Plains, knolls, alluvial fans, hillsides
Landform position (two-dimensional): Toeslope, footslope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Crago, greater slope

Percent of map unit: 3 percent
Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Crago, cobbly

Percent of map unit: 2 percent
Landform: Plains, alluvial fans, hillsides, escarpments

Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Pensore

Percent of map unit: 1 percent
Landform: Knolls, hillsides, ridges, strath terraces, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Shallow (Sw) 10-14" p.z. (R044XC452MT)

Crago, stony

Percent of map unit: 1 percent
Landform: Plains, alluvial fans, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

506A—Nippt-Attewan complex, 0 to 2 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,000 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Nippt and similar soils: 70 percent
Attewan and similar soils: 25 percent
Minor components: 5 percent

Description of Nippt

Setting

Landform: Stream terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium over sandy and gravelly alluvium

Typical profile

E - 0 to 4 inches: cobbly loam
Bt - 4 to 10 inches: gravelly clay loam
2Bk - 10 to 60 inches: extremely gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Description of Attewan

Setting

Landform: Stream terraces
Down-slope shape: Linear

Across-slope shape: Linear
Parent material: Alluvium

Typical profile

A - 0 to 5 inches: loam
Bt - 5 to 10 inches: clay loam
Bk - 10 to 23 inches: gravelly loam
2C - 23 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Farmland classification: Not prime farmland
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Minor Components

Very cobbly loam surfaces

Percent of map unit: 5 percent
Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

513A—Attewan-Nippt complex, 0 to 2 percent slopes

Map Unit Setting

Elevation: 3,600 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Attewan and similar soils: 60 percent
Nippt and similar soils: 30 percent
Minor components: 10 percent

Description of Attewan

Setting

Landform: Stream terraces, plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Fine-loamy alluvium over sandy and gravelly alluvium

Typical profile

A - 0 to 5 inches: loam
Bt - 5 to 10 inches: clay loam
Bk - 10 to 23 inches: gravelly loam
2C - 23 to 60 inches: very gravelly loamy sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Low (about 4.6 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Description of Nippt

Setting

Landform: Flood-plain steps, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Gravelly alluvium over sandy and gravelly alluvium

Typical profile

E - 0 to 3 inches: gravelly loam
Bt - 3 to 9 inches: very gravelly clay loam
Bk1 - 9 to 15 inches: very gravelly sandy loam
2Bk2 - 15 to 60 inches: very gravelly sand

Properties and qualities

Slope: 0 to 2 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Available water storage in profile: Very low (about 2.3 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): 6s
Land capability classification (nonirrigated): 6s
Hydrologic Soil Group: B
Ecological site: Shallow to Gravel (SwGr) 10-14" p.z. (R044XC454MT)

Minor Components

Nippt, very cobbly

Percent of map unit: 5 percent
Landform: Flood-plain steps, terraces
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Nippt, very gravelly

Percent of map unit: 5 percent
Landform: Flood-plain steps, terraces
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Gravel (Gr) 10-14" p.z. (R044XC447MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Lewis and Clark County Area, Montana

533B—Sappington-Musselshell gravelly loams, 2 to 8 percent slopes

Map Unit Setting

Elevation: 3,800 to 4,500 feet
Mean annual precipitation: 10 to 14 inches
Mean annual air temperature: 37 to 45 degrees F
Frost-free period: 105 to 120 days

Map Unit Composition

Sappington and similar soils: 50 percent
Musselshell and similar soils: 40 percent
Minor components: 10 percent

Description of Sappington

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium

Typical profile

A - 0 to 4 inches: loam
Bt - 4 to 6 inches: clay loam
Btk - 6 to 9 inches: loam
Bk1 - 9 to 20 inches: loam
Bk2 - 20 to 60 inches: loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 40 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 8.1 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: Silty (Si) 10-14" p.z. (R044XC455MT)

Description of Musselshell

Setting

Landform: Alluvial fans
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy alluvium derived from limestone

Typical profile

A - 0 to 4 inches: gravelly loam
Bk1 - 4 to 34 inches: gravelly loam
Bk2 - 34 to 60 inches: very gravelly sandy loam

Properties and qualities

Slope: 2 to 8 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 60 percent
Salinity, maximum in profile: Nonsaline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.5 inches)

Interpretive groups

Farmland classification: Farmland of local importance
Land capability classification (irrigated): 4
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Minor Components

Crago

Percent of map unit: 5 percent
Landform: Plains, alluvial fans, alluvial fans, hillsides, hillsides, escarpments
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Musselshell

Percent of map unit: 5 percent
Landform: Plains, alluvial fans, alluvial fans, hillsides
Down-slope shape: Linear
Across-slope shape: Linear

Ecological site: Silty-Limy (SiLy) 10-14" p.z. (R044XC457MT)

Data Source Information

Soil Survey Area: Lewis and Clark County Area, Montana
Survey Area Data: Version 9, Dec 10, 2013

Appendix D
Biological Species of Concern Reports

Animal Species of Concern

Species List Last Updated **04/21/2014**

1 Special Status Species
5 Species of Concern
5 Potential Species of Concern
Filtered by the following criteria:
Township = 10 N Range = 2 W

MONTANA Natural Heritage Program

A program of the Montana State Library's Natural Resource Information System operated by the University of Montana.

Species of Concern

5 Species
Filtered by the following criteria:
Township = 10 N Range = 2 W

BIRDS (AVES)

4 SPECIES
FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 2 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Aquila chrysaetos Golden Eagle	**Accipitridae** Hawks / Kites / Eagles	G5	S3	BGEPA; MBTA; BCC		SENSITIVE	2	3%	100%	Grasslands
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Custer, Deer Lodge, Fallon, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Lake, Lewis and Clark, Madison, McCone, Musselshell, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Teton, Toole, Valley, Wheatland, Yellowstone								
Ardea herodias Great Blue Heron	**Ardeidae** Bitterns / Egrets / Herons / Night-Herons	G5	S3				3	3%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Small breeding population size, evidence of recent declines, and declining regeneration of riparian cottonwood forests due to altered hydrology and grazing.								
Catharus fuscescens Veery	**Turdidae** Thrushes	G5	S3B				2	6%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone								
Dolichonyx oryzivorus Bobolink	**Icteridae** Blackbirds	G5	S3B			SENSITIVE	3	9%	100%	Moist grasslands
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Meagher, Missoula, Park, Petroleum, Phillips, Powell, Ravalli, Richland, Roosevelt, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Valley, Wibaux, Yellowstone **State Rank Reason:** Species has undergone recent large population declines in Montana and a patchwork of declines and increases have been documented in surrounding states and provinces.								

FISH (ACTINOPTERYGII)

1 SPECIES
FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 2 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Oncorhynchus clarkii lewisi	**Salmonidae** Trout	G4T3	S2		SENSITIVE	SENSITIVE	1		34%	Mountain streams, rivers, lakes

Westslope Cutthroat Trout		**Species verified in these Counties:** Beaverhead, Broadwater, Carbon, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Sweet Grass, Teton, Wheatland

Potential Species of Concern

5 Species

Filtered by the following criteria:

Township = 10 N Range = 2 W

BIRDS (AVES)

2 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 2 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Bucephala islandica Barrow's Goldeneye	**Anatidae** Swans / Geese / Ducks	G5	S4				3	2%	31%	Mountain Lakes and Wetlands
		Species verified in these Counties: Beaverhead, Broadwater, Cascade, Chouteau, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, McCone, Mineral, Missoula, Park, Phillips, Pondera, Powell, Ravalli, Roosevelt, Sanders, Sheridan, Silver Bow, Teton, Toole, Valley								
Lophodytes cucullatus Hooded Merganser	**Anatidae** Swans / Geese / Ducks	G5	S4				2	2%	100%	Rivers / Riparian Wetland
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Mineral, Missoula, Musselshell, Park, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Teton, Valley, Yellowstone								

FISH (ACTINOPTERYGII)

1 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 2 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Lota lota Burbot	**Gadidae** Burbot	G5	S4				1	1%	20%	Large rivers, lakes
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fergus, Flathead, Garfield, Glacier, Golden Valley, Hill, Jefferson, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Petroleum, Phillips, Pondera, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

INVERTEBRATES - INSECTS

2 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 2 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
DRAGONFLIES										
Rhionaeschna californica California Darner	**Aeshnidae** Darner Dragonflies	G5	S3S5						69%	Wetlands / lakes with emergent veg
		Species verified in these Counties: Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Golden Valley, Granite, Hill, Jefferson, Lewis and Clark, Madison, Meagher, Missoula, Park, Petroleum, Phillips, Powell, Stillwater, Sweet Grass, Yellowstone								
Rhionaeschna multicolor Blue-eyed Darner	**Aeshnidae** Darner Dragonflies	G5	S2S4						84%	Wetlands / lakes with emergent veg
		Species verified in these Counties: Big Horn, Blaine, Carter, Cascade, Custer, Deer Lodge, Flathead, Granite, Hill, Lewis and Clark, Liberty, Lincoln, Madison, Missoula, Powder River, Silver Bow, Yellowstone								

Special Status Species

1 Species

Filtered by the following criteria:

Township = 10 N Range = 2 W

BIRDS (AVES)										**1 SPECIES** FILTERED BY THE FOLLOWING CRITERIA: TOWNSHIP = 10 N RANGE = 2 W
SCIENTIFIC NAME COMMON NAME TAXA SORT	**FAMILY (SCIENTIFIC) FAMILY (COMMON)**	**GLOBAL RANK**	**STATE RANK**	**USFWS**	**USFS**	**BLM**	**CFWCS TIER ID**	**% OF GLOBAL BREEDING RANGE IN MT**	**% OF MT THAT IS BREEDING RANGE**	**HABITAT**
Haliaeetus leucocephalus Bald Eagle	**Accipitridae** Hawks / Kites / Eagles	G5	S4	DM; BGEPA; MBTA; BCC	SENSITIVE	SENSITIVE	1	2%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Glacier, Granite, Hill, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Musselshell, Park, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Populations numbers have steadily increased since the 1980s and breeding pairs now occupy a high percentage of suitable habitat across the state. However the species is still protected under the Bald and Golden Eagle Protection Act of 1940.								

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 7/21/2014, from http://mtnhp.org/SpeciesOfConcern/?AorP=a

Animal Species of Concern

Species List Last Updated **04/21/2014**

1 Special Status Species
11 Species of Concern
5 Potential Species of Concern
Filtered by the following criteria:
Township = 10 N Range = 3 W

Montana Natural Heritage Program

A program of the Montana State Library's Natural Resource Information System operated by the University of Montana.

Species of Concern

11 Species
Filtered by the following criteria:
Township = 10 N Range = 3 W

MAMMALS (MAMMALIA)

2 SPECIES
FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Gulo gulo Wolverine	**Mustelidae** Weasels	G4	S3	C	SENSITIVE	SENSITIVE	2	0%	37%	Boreal Forest and Alpine Habitats
		Species verified in these Counties: Beaverhead, Broadwater, Carbon, Cascade, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Park, Pondera, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland								
Lasiurus cinereus Hoary Bat	**Vespertilionidae** Bats	G5	S3				2	2%	100%	Riparian and forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Prairie, Ravalli, Richland, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wibaux, Yellowstone								

BIRDS (AVES)

8 SPECIES
FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Ardea herodias Great Blue Heron	**Ardeidae** Bitterns / Egrets / Herons / Night-Herons	G5	S3				3	3%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Stillwater, Sweet Grass, Teton, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Small breeding population size, evidence of recent declines, and declining regeneration of riparian cottonwood forests due to altered hydrology and grazing.								
Catharus fuscescens Veery	**Turdidae** Thrushes	G5	S3B				2	6%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone								
Dolichonyx oryzivorus Bobolink	**Icteridae** Blackbirds	G5	S3B			SENSITIVE	3	9%	100%	Moist grasslands
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Fallon, Fergus, Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, Meagher, Missoula, Park, Petroleum, Phillips, Powell, Ravalli, Richland, Roosevelt, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Valley, Wibaux, Yellowstone								

		State Rank Reason: Species has undergone recent large population declines in Montana and a patchwork of declines and increases have been documented in surrounding states and provinces.								
Gymnorhinus cyanocephalus Pinyon Jay	**Corvidae** Jays / Crows / Magpies	G5	S3				2	5%	55%	Open conifer forest
		Species verified in these Counties: Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Fergus, Gallatin, Garfield, Jefferson, Lewis and Clark, Musselshell, Park, Petroleum, Phillips, Powder River, Rosebud, Stillwater, Sweet Grass, Wheatland, Yellowstone								
Haemorhous cassinii Cassin's Finch	**Fringillidae** Finches	G5	S3				3	11%	62%	Drier conifer forest
		Species verified in these Counties: Beaverhead, Big Horn, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Wheatland, Yellowstone								
Nucifraga columbiana Clark's Nutcracker	**Corvidae** Jays / Crows / Magpies	G5	S3				3	9%	84%	Conifer forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Glacier, Golden Valley, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Lincoln, Madison, Meagher, Mineral, Missoula, Musselshell, Park, Petroleum, Phillips, Pondera, Powder River, Powell, Ravalli, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Wheatland								
Numenius americanus Long-billed Curlew	**Scolopacidae** Sandpipers	G5	S3B			SENSITIVE	1	19%	100%	Grasslands
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Daniels, Dawson, Deer Lodge, Fallon, Fergus, Gallatin, Glacier, Golden Valley, Granite, Hill, Jefferson, Judith Basin, Lake, Lewis and Clark, Liberty, Madison, McCone, Meagher, Missoula, Musselshell, Petroleum, Phillips, Powder River, Powell, Prairie, Ravalli, Roosevelt, Rosebud, Sanders, Sheridan, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								
Spizella breweri Brewer's Sparrow	**Emberizidae** Sparrows	G5	S3B			SENSITIVE	2	12%	100%	Sagebrush
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Chouteau, Custer, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Garfield, Glacier, Golden Valley, Hill, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Musselshell, Park, Petroleum, Phillips, Powder River, Powell, Prairie, Ravalli, Rosebud, Sanders, Silver Bow, Stillwater, Teton, Toole, Valley, Wheatland, Yellowstone **State Rank Reason:** Species faces threats from loss of sagebrush habitats it is dependent on as a result of habitat covertype conversion for agriculture and increased frequency of fire as a result of weed encroachment and drought.								

AMPHIBIANS (AMPHIBIA)

1 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Spea bombifrons Plains Spadefoot	**Scaphiopodidae** Spadefoots	G5	S3		SENSITIVE	SENSITIVE	2	12%	73%	Wetlands, floodplain pools
		Species verified in these Counties: Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Custer, Fergus, Gallatin, Garfield, Golden Valley, Lewis and Clark, Musselshell, Petroleum, Powder River, Prairie, Rosebud, Sheridan, Stillwater, Toole, Treasure, Valley, Yellowstone								

Potential Species of Concern

5 Species

Filtered by the following criteria:

Township = 10 N Range = 3 W

BIRDS (AVES)

1 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Lophodytes cucullatus Hooded Merganser	**Anatidae** Swans / Geese / Ducks	G5	S4				2	2%	100%	Rivers / Riparian Wetland
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Deer Lodge, Flathead, Gallatin, Glacier, Granite, Jefferson, Lake, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Mineral, Missoula, Musselshell, Park, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Roosevelt, Rosebud, Sanders, Sheridan, Silver Bow, Teton, Valley, Yellowstone								

FISH (ACTINOPTERYGII)

1 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Lota lota Burbot	**Gadidae** Burbot	G5	S4				1	1%	20%	Large rivers, lakes
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fergus, Flathead, Garfield, Glacier, Golden Valley, Hill, Jefferson, Lewis and Clark, Liberty, Lincoln, Madison, McCone, Meagher, Petroleum, Phillips, Pondera, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone								

INVERTEBRATES - INSECTS

3 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
DRAGONFLIES										
Rhionaeschna californica California Darner	**Aeshnidae** Darner Dragonflies	G5	S3S5						69%	Wetlands / lakes with emergent veg
		Species verified in these Counties: Broadwater, Carbon, Carter, Cascade, Chouteau, Deer Lodge, Fergus, Flathead, Gallatin, Golden Valley, Granite, Hill, Jefferson, Lewis and Clark, Madison, Meagher, Missoula, Park, Petroleum, Phillips, Powell, Stillwater, Sweet Grass, Yellowstone								
Rhionaeschna multicolor Blue-eyed Darner	**Aeshnidae** Darner Dragonflies	G5	S2S4						84%	Wetlands / lakes with emergent veg
		Species verified in these Counties: Big Horn, Blaine, Carter, Cascade, Custer, Deer Lodge, Flathead, Granite, Hill, Lewis and Clark, Liberty, Lincoln, Madison, Missoula, Powder River, Silver Bow, Yellowstone								
Sympetrum madidum Red-veined Meadowhawk	**Libellulidae** Skimmer Dragonflies	G4	S2S3						100%	Wetlands / lakes with emergent veg
		Species verified in these Counties: Beaverhead, Big Horn, Carter, Chouteau, Deer Lodge, Flathead, Glacier, Hill, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, Missoula, Petroleum, Pondera, Powder River, Powell, Rosebud, Valley, Yellowstone								

Special Status Species

1 Species

Filtered by the following criteria:

Township = 10 N Range = 3 W

BIRDS (AVES)										1 SPECIES FILTERED BY THE FOLLOWING CRITERIA: TOWNSHIP = 10 N RANGE = 3 W
SCIENTIFIC NAME COMMON NAME TAXA SORT	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	CFWCS TIER ID	% OF GLOBAL BREEDING RANGE IN MT	% OF MT THAT IS BREEDING RANGE	HABITAT
Haliaeetus leucocephalus Bald Eagle	**Accipitridae** Hawks / Kites / Eagles	G5	S4	DM; BGEPA; MBTA; BCC	SENSITIVE	SENSITIVE	1	2%	100%	Riparian forest
		Species verified in these Counties: Beaverhead, Big Horn, Blaine, Broadwater, Carbon, Carter, Cascade, Chouteau, Custer, Dawson, Deer Lodge, Fallon, Fergus, Flathead, Gallatin, Glacier, Granite, Hill, Jefferson, Lake, Lewis and Clark, Lincoln, Madison, McCone, Meagher, Mineral, Missoula, Musselshell, Park, Phillips, Pondera, Powder River, Powell, Prairie, Ravalli, Richland, Roosevelt, Rosebud, Sanders, Silver Bow, Stillwater, Sweet Grass, Teton, Toole, Treasure, Valley, Wheatland, Wibaux, Yellowstone **State Rank Reason:** Populations numbers have steadily increased since the 1980s and breeding pairs now occupy a high percentage of suitable habitat across the state. However the species is still protected under the Bald and Golden Eagle Protection Act of 1940.								

Citation for data on this website:
Montana Animal Species of Concern Report. Montana Natural Heritage Program and Montana Fish, Wildlife and Parks. Retrieved on 7/22/2014, from http://mtnhp.org/SpeciesOfConcern/?AorP=a

Plant Species of Concern

Species List Last Updated **06/18/2014**

Filtered by the following criteria:
Township = 10 N Range = 2 W

A program of the Montana State Library's
Natural Resource Information System
operated by the University of Montana.

Species of Concern

0 Species

Filtered by the following criteria:
Township = 10 N Range = 2 W

Potential Species of Concern

0 Species

Filtered by the following criteria:

Township = 10 N Range = 2 W

Special Status Species

0 Species

Filtered by the following criteria:

Township = 10 N Range = 2 W

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 7/24/2014, from http://mtnhp.org/SpeciesOfConcern/?AorP=p

Plant Species of Concern

2 Species of Concern
1 Potential Species of Concern
Filtered by the following criteria:
Township = 10 N Range = 3 W

Species List Last Updated **06/18/2014**

MONTANA Natural Heritage Program

A program of the Montana State Library's Natural Resource Information System operated by the University of Montana.

Species of Concern

2 Species
Filtered by the following criteria:
Township = 10 N Range = 3 W

FLOWERING PLANTS - DICOTS (MAGNOLIOPSIDA)

2 SPECIES
FILTERED BY THE FOLLOWING CRITERIA:
TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Astragalus convallarius Lesser Rushy Milkvetch		**Fabaceae** Pea Family	G5	S3			SENSITIVE	2	Grasslands (Intermountain)
			Species verified in these Counties: Beaverhead, Broadwater, Jefferson, Lewis and Clark **State Rank Reason:** The distribution of *A. convallarius* in Montana is limited to two disjuct localities in the state: the Helena Valley vicinity and an area in extreme southwest Montana in Beaverhead County. The species has been and continues to be negatively impacted by development in the Helena area. Past development in the Helena Valley likely eliminated extensive areas of previously occupied habitat resulting in the more fragmented distribution seen today. The grassland habitats this species occupies are also being invaded by several noxious weeds, partcularly in the Helena vicinity. However, the species appears to tolerate some levels of disturbance and degradation of habitat quality. Several large occurrences are presently known and some areas of potentially suitable habitat remain unsurveyed.						
Atriplex truncata Wedge-leaf Saltbush		**Amaranthaceae** Amaranth (Pigweed) Family	G5	S3				3	Wetland/Riparian
			Species verified in these Counties: Beaverhead, Deer Lodge, Jefferson, Lake, Lewis and Clark, Park **State Rank Reason:** Known from two extent occurrences; one in the Centennial Valley and the other near Warm Springs. Also, known historically from four collections in the western half of the state. Additional population and trend data are needed to better evaluate the species' vulnerability.						

Potential Species of Concern

1 Species

Filtered by the following criteria:

Township = 10 N Range = 3 W

FLOWERING PLANTS - MONOCOTS (LILIOPSIDA)

1 SPECIES

FILTERED BY THE FOLLOWING CRITERIA:

TOWNSHIP = 10 N RANGE = 3 W

SCIENTIFIC NAME COMMON NAME TAXA SORT	OTHER NAMES	FAMILY (SCIENTIFIC) FAMILY (COMMON)	GLOBAL RANK	STATE RANK	USFWS	USFS	BLM	MNPS THREAT CATEGORY	HABITAT
Cypripedium parviflorum Small Yellow Lady's-slipper	**Cypripedium calceolus**	**Orchidaceae** Orchids	G5	S3S4		SENSITIVE		2	
			Species verified in these Counties: Flathead, Gallatin, Granite, Jefferson, Judith Basin, Lake, Lewis and Clark, Lincoln, Missoula, Pondera, Stillwater, Sweet Grass, Teton **State Rank Reason:** Many occurrences known from the western half of the state, including a dozen or so historical or poorly documented sites. Many occurrences have small population numbers, though approximately two dozen occurrences are moderate to large populations. Populations occur on variety of federal, state and private ownerships with varied land uses and management. A variety of land uses and activities, including development, livestock grazing and timber harvesting may have detrimental impacts to populations. However, yellow lady's-slipper appears to be tolerant to some disturbances at low levels and the number of populations scattered over a wide area reduces the risk to the species. A loss of populations or a significant decline in numbers may warrant a re-listing as a Species of Concern in Montana, and populations should continue to be monitored on a semi-regular basis. Moderate to large occurrences should be managed to maintain habitat and viable population numbers.						

Special Status Species

0 Species

Filtered by the following criteria:

Township = 10 N Range = 3 W

Citation for data on this website:
Montana Plant Species of Concern Report. Montana Natural Heritage Program. Retrieved on 7/22/2014, from http://mtnhp.org/SpeciesOfConcern/?AorP=p

Appendix E
Floodplain Maps

HOME FEMA's National Flood Hazard Layer (Official)

Details | Basemap | Share | Print | Measure | 1942 Harvest Loop, East H

About Content Legend

Legend

NFHL (click to expand)

LOMRs

- Effective

LOMAs

FIRM Panels

Cross-Sections

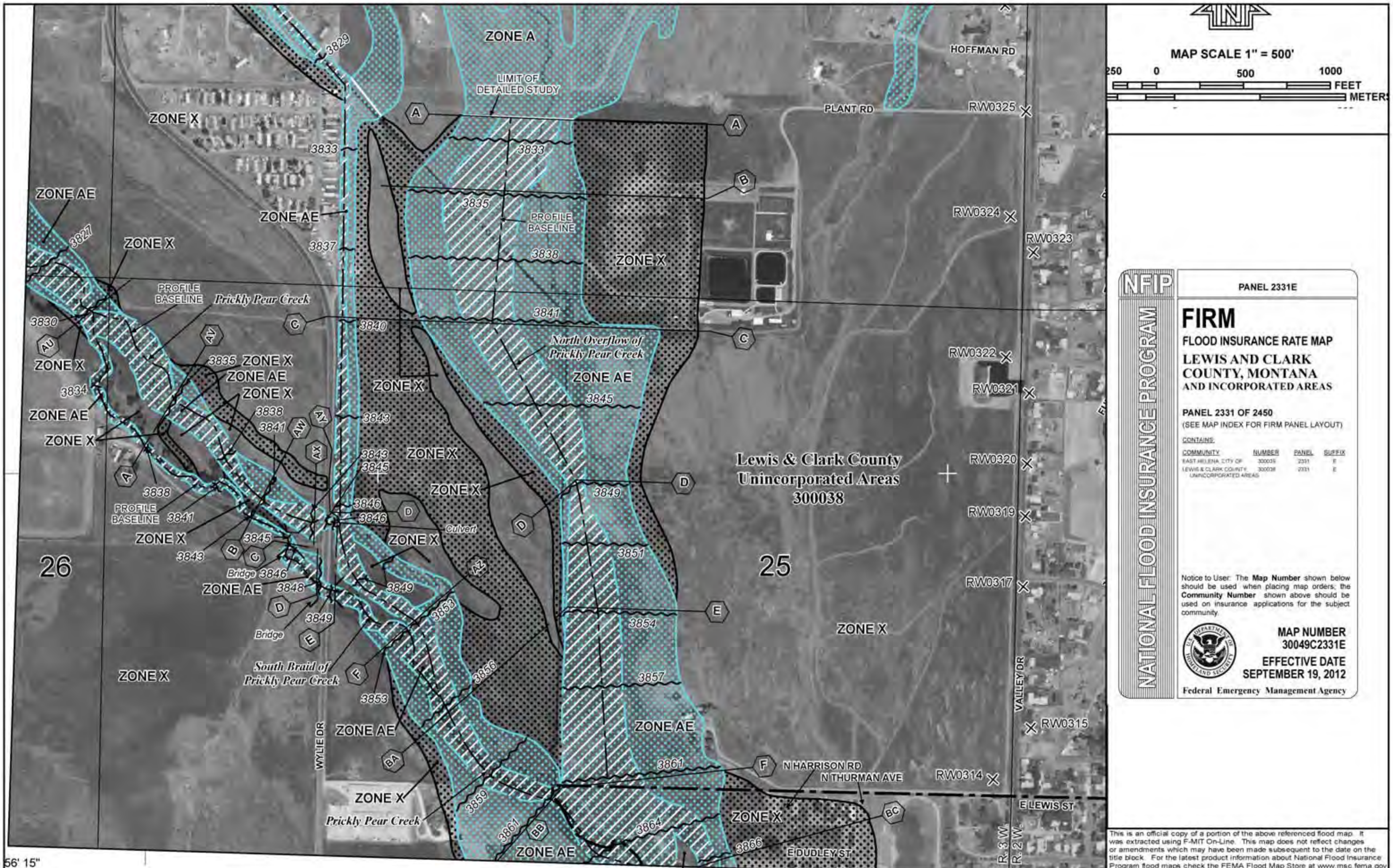
Base Flood Elevations

Flood Hazard Boundaries

- Other Boundaries
- Limit Lines
- SFHA / Flood Zone Boundary

Flood Hazard Zones

- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Special Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard



MAP SCALE 1" = 500'
250 0 500 1000
FEET
METERS
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 2331E
FIRM
FLOOD INSURANCE RATE MAP
LEWIS AND CLARK COUNTY, MONTANA
AND INCORPORATED AREAS
PANEL 2331 OF 2450
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY NUMBER PANEL SUFFIX
EAST HELENA, CITY OF 300035 2331 E
LEWIS & CLARK COUNTY UNINCORPORATED AREAS 300038 2331 E
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.
MAP NUMBER
30049C2331E
EFFECTIVE DATE
SEPTEMBER 19, 2012
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov
Lewis & Clark County
Unincorporated Areas
300038
ZONE A
ZONE AE
ZONE X
LIMIT OF DETAILED STUDY
PROFILE BASELINE
Prickly Pear Creek
North Overflow of Prickly Pear Creek
South Braid of Prickly Pear Creek
Culvert
Bridge
HOFFMAN RD
PLANT RD
WYLIE DR
VALLEY DR
N HARRISON RD
N THURMAN AVE
E LEWIS ST
E DUDLEY ST
RW0325
RW0324
RW0323
RW0322
RW0321
RW0320
RW0319
RW0317
RW0315
RW0314
26
25
R. 3 W.
R. 2 W.
56' 15"

MAP SCALE 1" = 1000'

500 0 1000 2000 FEET

METERS

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 2355E

FIRM

FLOOD INSURANCE RATE MAP

LEWIS AND CLARK COUNTY, MONTANA AND INCORPORATED AREAS

PANEL 2355 OF 2450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEWIS & CLARK COUNTY, UNINCORPORATED AREAS	300038	2355	E

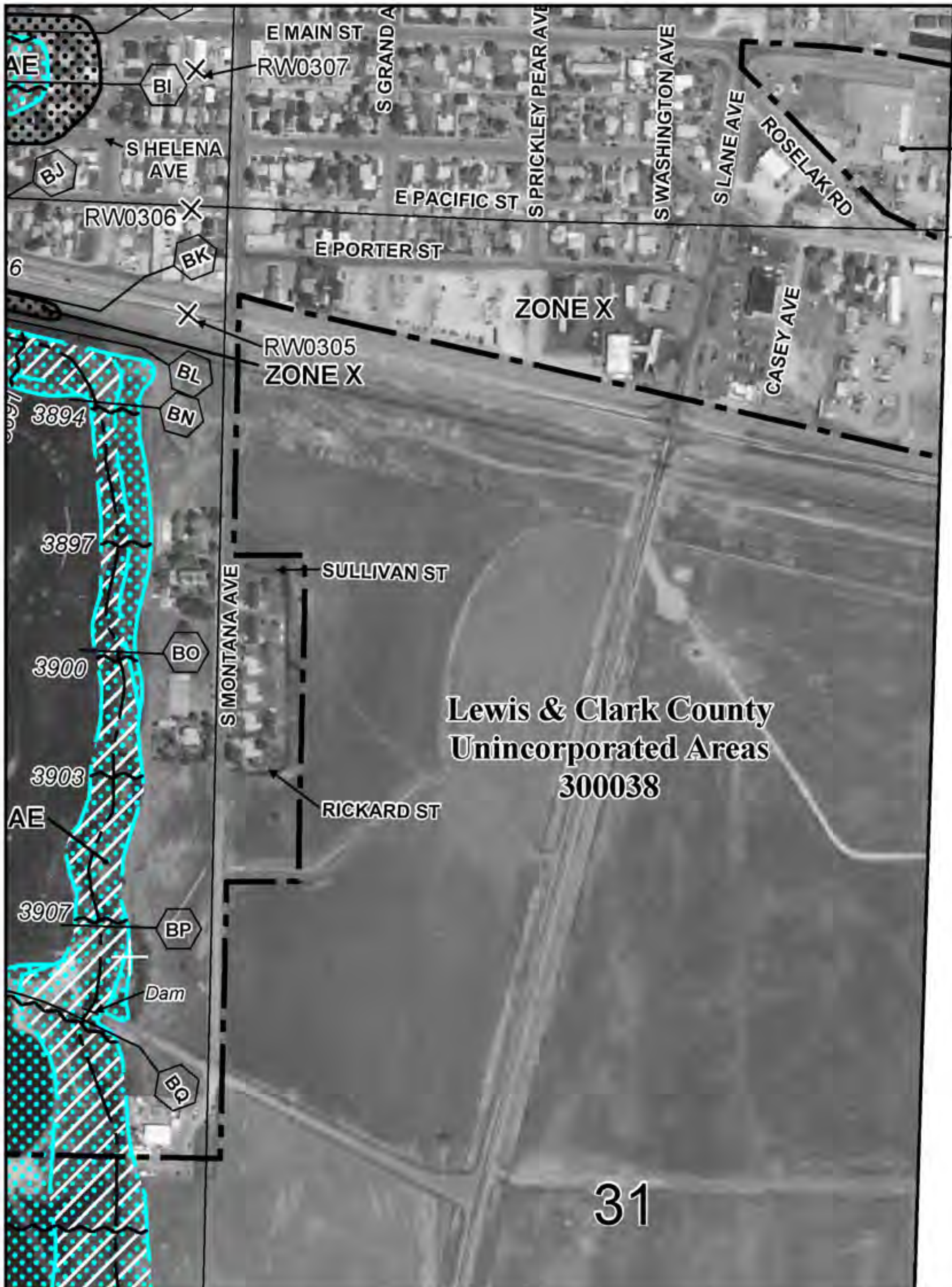
Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER 30049C2355E

EFFECTIVE DATE SEPTEMBER 19, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov



MAP SCALE 1" = 500'

250	0	500	1000	FEET

METERS

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 2333E

FIRM

FLOOD INSURANCE RATE MAP

LEWIS AND CLARK COUNTY, MONTANA AND INCORPORATED AREAS

PANEL 2333 OF 2450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

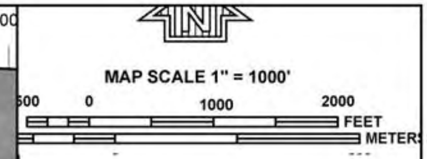
COMMUNITY	NUMBER	PANEL	SUFFIX
EAST HELENA, CITY OF	300039	2333	E
HELENA, CITY OF	300040	2333	E
LEWIS & CLARK COUNTY, UNINCORPORATED AREAS	300038	2333	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
30049C2333E

EFFECTIVE DATE
SEPTEMBER 19, 2012

Federal Emergency Management Agency



NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 2355E

FIRM

FLOOD INSURANCE RATE MAP

LEWIS AND CLARK COUNTY, MONTANA
AND INCORPORATED AREAS

PANEL 2355 OF 2450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LEWIS & CLARK COUNTY, UNINCORPORATED AREAS	300038	2355	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
30049C2355E

EFFECTIVE DATE
SEPTEMBER 19, 2012

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

MAP SCALE 1" = 500'

250 0 500 1000 FEET

METERS

NATIONAL FLOOD INSURANCE PROGRAM

NFIP

PANEL 2332E

FIRM

FLOOD INSURANCE RATE MAP

LEWIS AND CLARK COUNTY, MONTANA

AND INCORPORATED AREAS

PANEL 2332 OF 2450

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
EAST HELENA, CITY OF	300039	2332	E
LEWIS & CLARK COUNTY, UNINCORPORATED AREAS	300038	2332	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
30049C2332E

EFFECTIVE DATE
SEPTEMBER 19, 2012

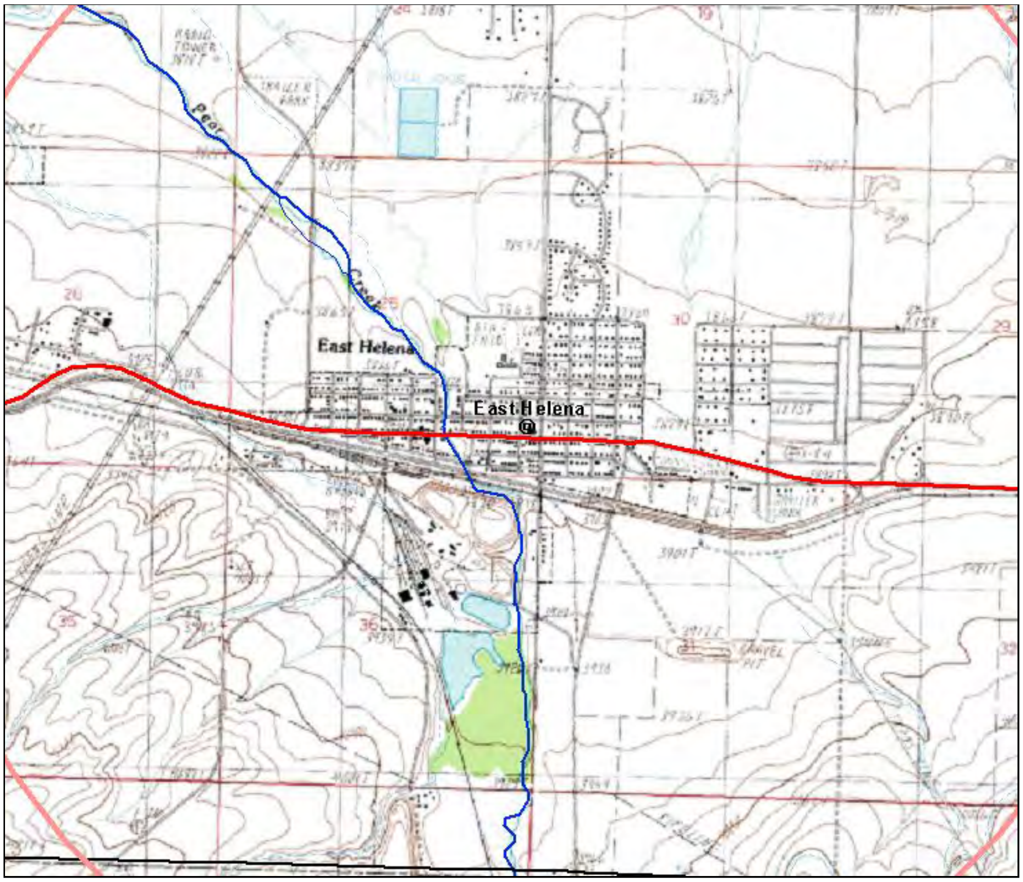
Federal Emergency Management Agency

Appendix F
Surface Water Mapping

Click here to close window and return to interactive map.

Major Streams - System Output Map **Date 7/21/2014 | Width of Map=3.27 Miles**

This map produced by the Natural Resource Information System-Helena MT 59620



Selection Area

TOWN='EAST HELENA'

With a Buffer of 2.00 Miles

Stream

Streams
- Major river or stream
- Other stream
- Un-named stream

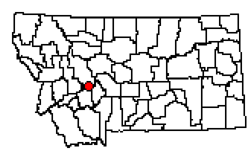
Town Population
- 0-100
- 101-1,000
- 1,001-5,000
- Over 5,000

County

Lake

Water Body
- Lake/Pond
- Swamp/Marsh
- Glacier

Highways
- Interstate Route
- U.S. Route
- Montana Route
- Secondary Route

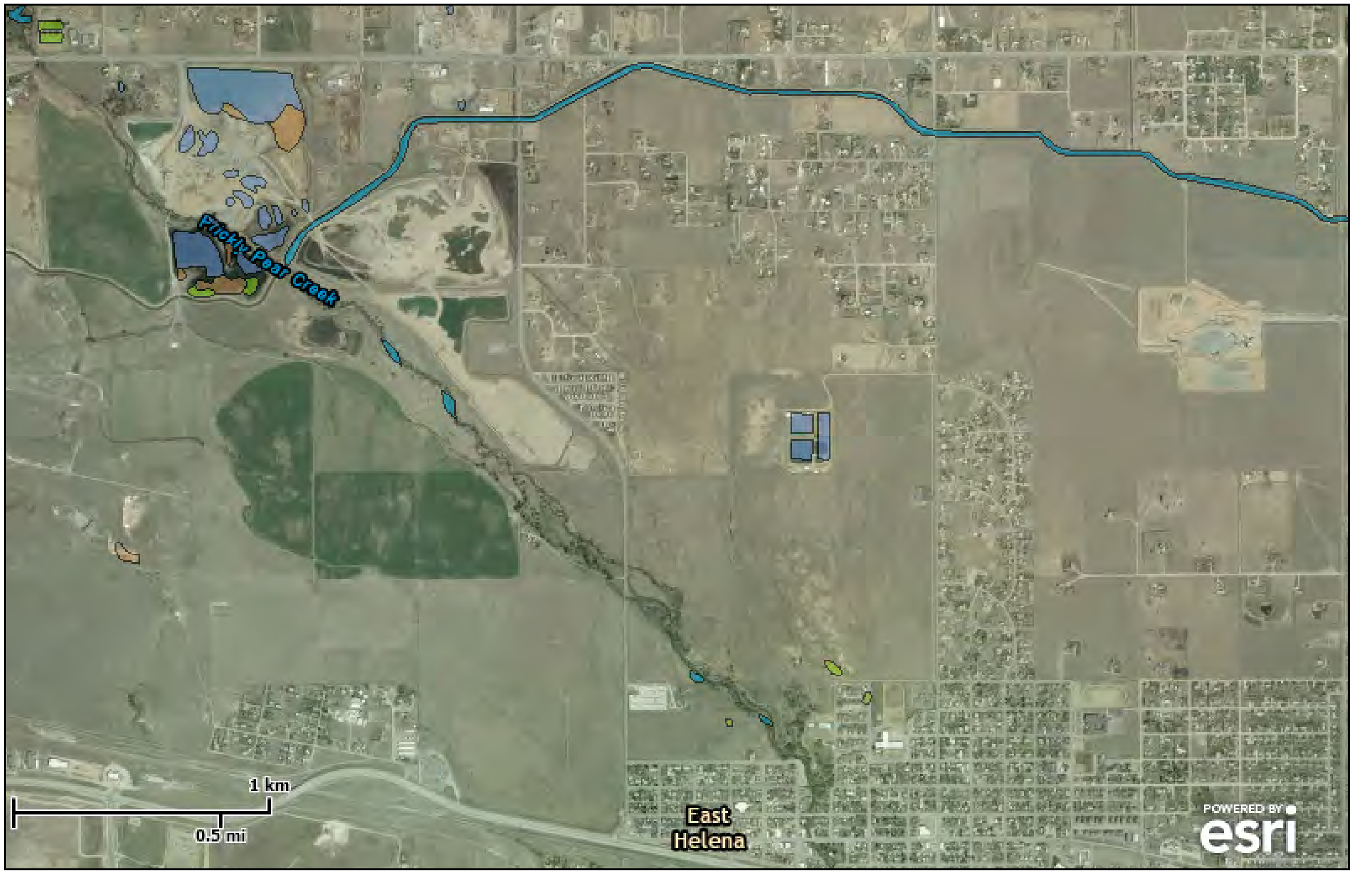


Appendix G
Known Wetland Areas

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jul 22, 2014



Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

Riparian Status

- Digital Data

User Remarks:

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jul 22, 2014

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

Riparian Status

- Digital Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jul 22, 2014

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

Riparian Status

- Digital Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

U.S. Fish and Wildlife Service

National Wetlands Inventory

Jul 22, 2014

Wetlands

- Freshwater Emergent
- Freshwater Forested/Shrub
- Estuarine and Marine Deepwater
- Estuarine and Marine
- Freshwater Pond
- Lake
- Riverine
- Other

Riparian

- Herbaceous
- Forested/Shrub

Riparian Status

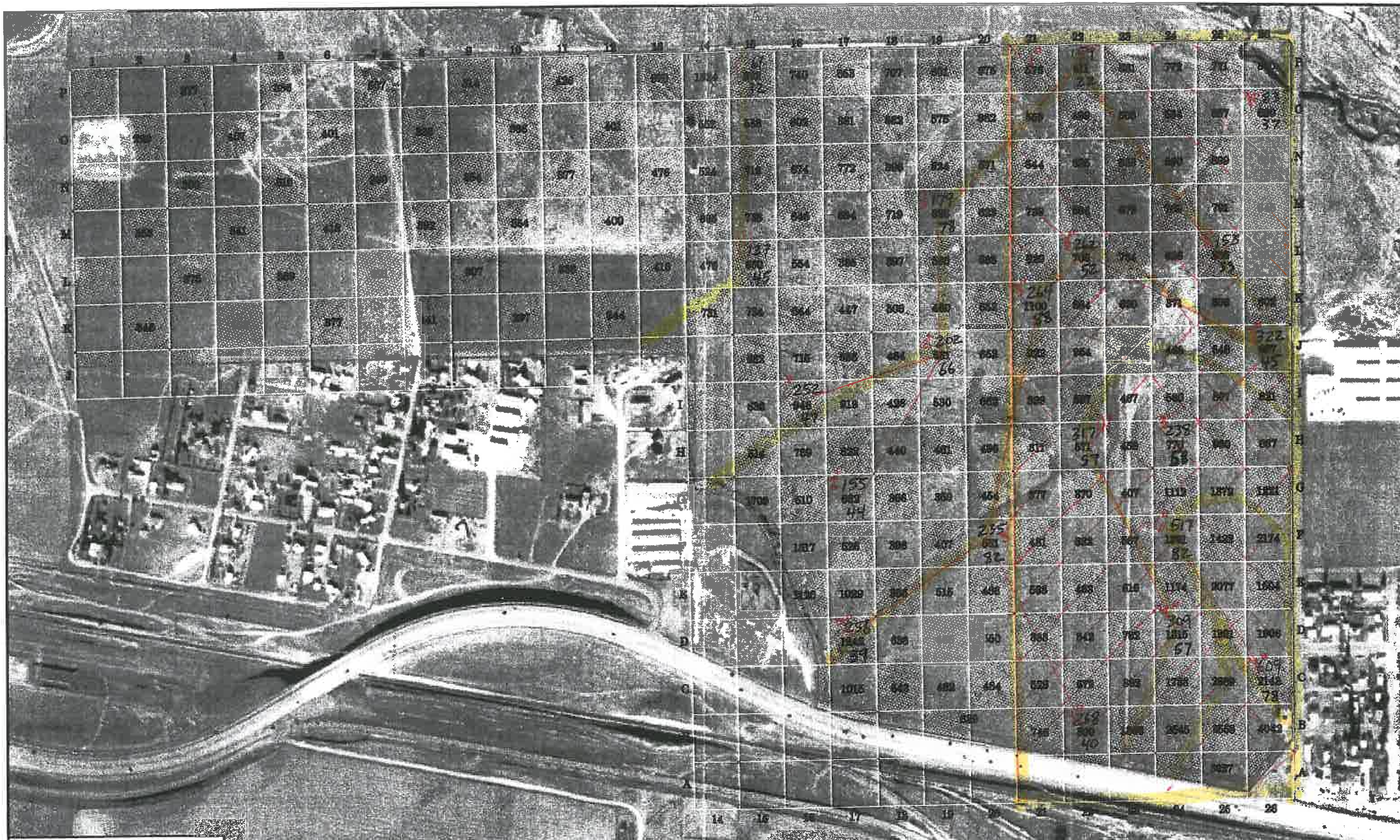
- Digital Data

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

User Remarks:

Appendix H
Site Soil Testing Information

Lamping Field



SCALE
(In Feet)
0 400
NORTH

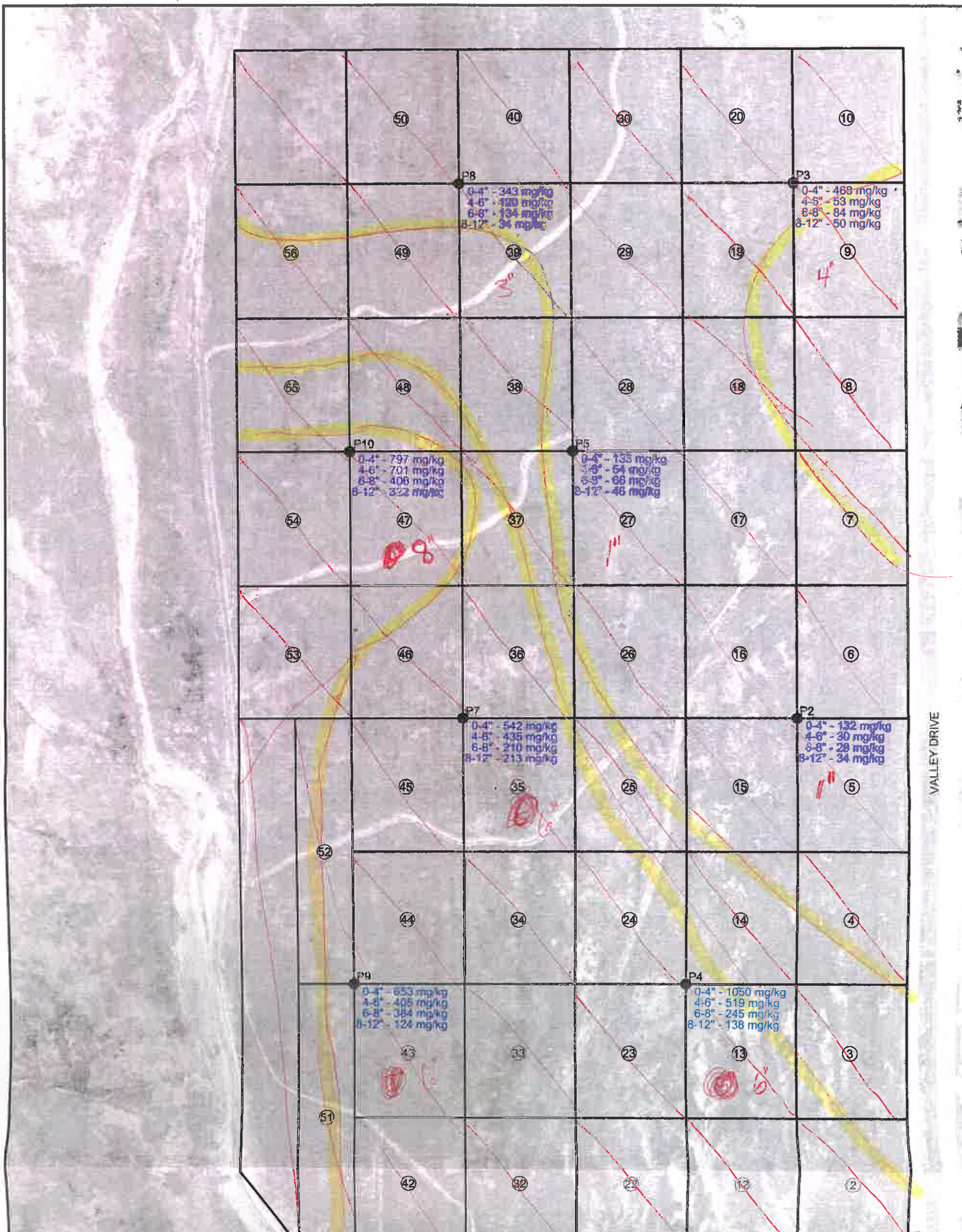
SAMPLED 11/01 UPPER 95% CALC, Pb
12/13/06
609 0-6"
2148 0-1"
78 6-12"

VA01 - ASARCO LAMPING PROPERTY

FIGURE
1

UPDATE TIME: 3:15PM
0249\HEL\103001\I:\Land Projects\1232C301\DWG\1232C301H069.dwg

Hydrometrics, Inc.



SCALE
NTS

NORTH

LEGEND

LEAD LEVEL

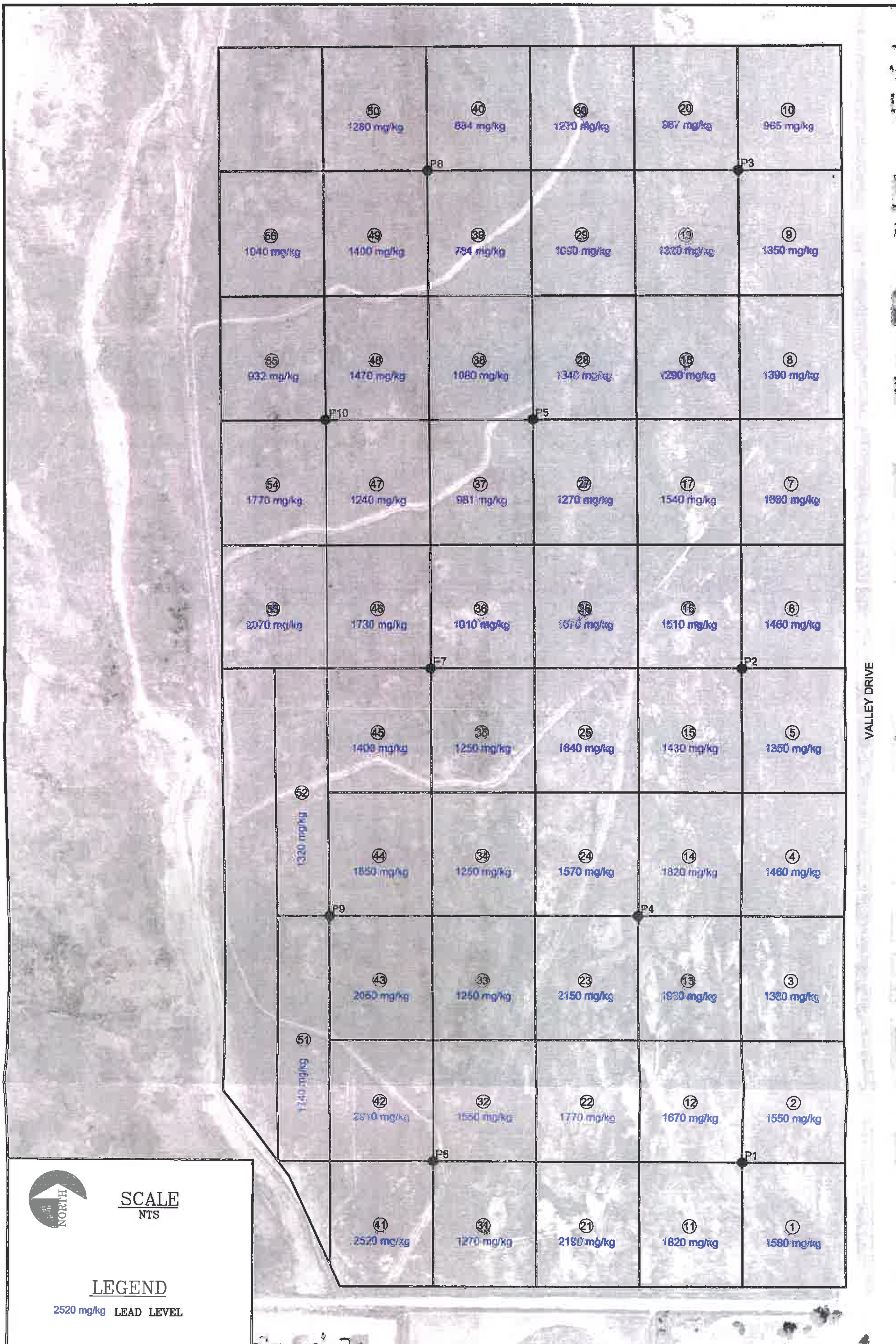
0-4" - 931 mg/kg
4-6" - 454 mg/kg
6-8" - 86 mg/kg
8-12" - 94 mg/kg

METG PROPERTY
EAST HELENA, MONTANA

PIT SAMPLE LEAD LEVELS

FIGURE
3-0

UPDATE TIME: 9:47AM
0072\HEL\050106\I:\Land Projects\1232C301\DWG\1232C301H345.dwg



METG PROPERTY
EAST HELENA, MONTANA

SURFACE SAMPLE LEAD LEVELS

FIGURE 1-0

UPDATE TIME: 9:47AM

UPDATE TIME: 3:15PM
0249\HEL\103001\L:\Land Projects\1232C301\DWG\1232C301H069.dwg

SCALE (In Feet) 0 400

NORTH

SAMPLED 11/01 UPPER 95% CALC. Pb

12/13/06 609 0-6" 2148 0-1" 78 6-12"

VA01 - ASARCO LAMPING PROPERTY

FIGURE 1

UPDATE TIME: 3:15PM
0249\HEL\103001\\:\Land Projects\1232C301\DWG\1232C301H069.dwg

Hydrometrics, Inc. ®

Dartman Field

MONTANA ENVIRONMENTAL TRUST GROUP PROPERTY

SOIL SAMPLING & ANALYTICAL REPORT

FOR:

EAST HELENA PUBLIC SCHOOLS

BY:

SDL ENTERPRISES, LLC

Objective

East Helena Public School (EHPS) is considering purchasing 55 acres of land that was formerly owned by Asarco Properties. Based on the historic information the property was flooded with waste materials produced at the Asarco Plant, there is reasonable concern that past waste materials from the flooding have impacted the surface and sub-surface on the subject property. A complete and thorough soil sampling process was conducted with 16 data points per acre. A complete soil assessment report was created herein for the East Helena School Board (EHSB) and the Montana Environmental Trust Group (METG) to assist with a potential purchase of the property. The remediation potential to the site will be considered by the EHSB for the purpose of acquisition of the parcel for a future building site for additional elementary, middle and high schools along with playing fields and recreational walkways and bikeways.

Location

The Property represents 55 acres of property, directly north of Radley School, west of Valley Drive, currently owned by METG. The EHSB is evaluating the purchase of this property for future school expansion. This property is located in the East Helena Asarco Superfund Site.

History

East Helena was the home of an operating lead smelter for more than 100 years. There has been an ongoing program remediating lead contaminated soil in East Helena over the last twenty years in an effort to protect the public from exposure to contaminated soils. Remediation of soils in and around the schools has created a clean and healthful environment on the school campuses. The school district in East Helena has 1,150 students that are educated in 3 school buildings located within that superfund site. East Helena is a growing community that is being impacted by new home construction, particularly from Mountain View Meadows Subdivision. At least 61 homes have already been built in an affordable housing portion of the subdivision, with more anticipated. The 1st phase of the development has more than 600 acres, approved for 800 homes. Using a per child figure of 0.4 school aged children per home formula quickly shows that the potential increase of 350 students in this subdivision would exceed the capacity of the existing buildings. With the future of expansion of classroom space necessitated by this growth of this single subdivision and other subdivisions, it is necessary for the school district to find property for a minimum of one to two new elementary or middle schools and a potential expansion of the district to have a high school. The property immediately adjacent to Radley Elementary is a logical move for the EHPS to consider to purchase. The EHSB, however, are concerned about the soil. The purpose of this project will be to identify real levels of contamination and the cost associated to remediate the property for a future school site.

Sampling Summary

The property was divided into 56 sections approximately one acre in size, to form a grid pattern that can be recreated for remediation purposes or further soil investigation in the future. There was a 16 spot composite sample collected from each individual section. A total of 896 sample points were used to collect the surface samples on the project. All surface samples were taken at 0-1 inch in depth from the ground surface. Additionally, a total of ten pit sample locations were established on the property. Four samples were collected from each pit sample location at depth intervals of 0-4, 4-6, 4-8, and 8-12 inches in depth from the ground surface. Four field duplicate samples were also collected. The methods of collection for the project were in accordance with *Hydrometrics Inc. 1991b Sampling and Analysis Plan (SAP)* created for the East Helena Residential Soils Project, as well as all the Modifications to the Administrative Order on Consent that update the current SAP.

Analysis Summary

All samples collected on the property were submitted to Energy Laboratories for analysis. Each of the samples was analyzed for lead, arsenic, and cadmium. All sample results for the property can be found in the Laboratory Analytical Reports. In addition, the data can be found in the Surface Sample Analytical Table, Pit Sample Analytical Table, as well as on the grid maps.

Of the 56 surface samples collected, 50 of the samples had concentrations exceeding 1000 ppm Pb. The remaining 6 samples ranged in concentration from 784 ppm Pb to 987 ppm Pb. Of the 56 surface samples collected, 31 of the samples had concentrations exceeding 100 ppm As. The remaining 25 samples ranged from 61 ppm As to 97 ppm As. All action levels for remediation on the East Helena Residential Soils Project are based on surface sample results. The project requires the analysis of Cadmium although no action level for Cadmium is in place on the project. The Cadmium results can be found in the Laboratory Analytical Reports. Given the concentrations of both lead and arsenic found on the surface of the property, however, all of the 56 sections of the property require remediation. Historically, The East Helena Residential Soils Project considered all remediation at schools similar as residential remediation in regard to action levels and cleanup levels.

In accordance with, *East Helena Superfund Site, Operable Unit #2, Residential Soils And Undeveloped Lands Final Record Of Decision, September 2009*, the entire property qualifies for remediation based on the surface levels over 500 ppm Pb.

The sample results for the pit sample range from 133 ppm Pb to 1050 ppm Pb for the 0-4 inch depth interval, 30 ppm Pb to 701 ppm Pb for the 4-6 inch depth interval, 29 ppm Pb to 406 ppm Pb for the 4-8 inch depth interval, 34 ppm Pb to 322 ppm Pb for the 8-12 inch depth interval.

Remediation Factors

In determining practical remediation factors from a construction perspective; current site conditions, proposed land use, soil type, surface sampling results, pit sample results, feasible disposal facility and replacement soil options are considered.

The current site conditions of an open field adjacent to currently developed properties without any natural or other obstacles make the property a viable property for remediation without any foreseen negative impact to the surrounding properties or community.

The proposed land use as a school property requires that remediation be performed. Once a remediation remedy is in place however, the property would be suitable for school use much like East Valley Middle School.

The soil type on the property does impact the practical decisions when determining remediation methods. The current topsoil layer is approximately 2-6 inches in depth and is considered rocky within that depth interval. Under that layer is an almost continual layer of rock with intermixed sand and loam with a few pockets of primarily sand.

As stated previously, the surface soil concentrations dictate that all areas of the 55 acre parcel be remediated if it is to be used as a school. The pit sample results indicate that a removal of 6 to 8 inches of soil is necessary to get the Pb levels to meet cleanup levels.

The METG currently offers a location for disposal of contaminated soils at a designated location adjacent to East Helena.

Suitable replacement soils are available locally. A facility such as school requires a variety of land uses for the property such as parking areas, activity fields, and actual building footprints. If a site plan was in place at the time of remediation it would be reasonable to import materials to be used in that area such as topsoil for activity fields and gravel materials for parking areas. In fact, you could actually complete parking areas and grassed activity fields prior to the school being built.

While considering all the factors involved from a construction perspective the two prevailing factors with this property are the contamination layer and the soil type and profile. The contamination is relatively uniform on this site and includes all portions of the property. This eliminates the possibility of partial remediation of the site or multiple types of remediation as the conditions are consistent throughout the property.

Remediation Options

Capping

Capping is the process of adding a cap or cover, over surfaces that do not meet remedial goals for new use. Caps do not reduce the concentrations of metals or arsenic in the soil. They do provide a barrier to exposure that would otherwise occur therefore interrupting the pathway for exposure. Capping can be a cost effective method when the contamination is deep in the ground and the removal and disposal options are costly. The few known examples of capping over future residential areas require a cap that is 24-48 inches in depth. Given the contamination layer on the property resides in the top 6 inches capping is not a viable remediation option for this property. Material import costs deem the process of general capping unrealistic. The cost to put even a 12-16 inch cap on the property is equal to the cost to remove and replace at the estimated 6" level for this property.

Asphalt capping is another method of providing a barrier to interrupt the pathway for exposure, generally seen in commercial applications. Again, given the thin layer of contamination on this property it makes this method unrealistic. The costs to asphalt an area one half acre in size would be in the $50,000 range. In order to apply asphalt you need a solid base layer of road mix material. Typically that would be in the 6" range for parking lots, following the removal of the topsoil layer. If you were placing that base atop a topsoil layer however you may have to increase that to the 12"-18"range to achieve an adequate base layer. The cost associated to add the additional material is roughly an additional $20,000 per acre. Again, the costs associated with this simply do not add up to being a realistic alternative.

In Place Treatment

The process of deep tilling simply put is thoroughly blending the soil to lower the surface soil contamination levels. In place treatment is considered an option when the surface soil profile has contamination but the subsurface levels are much lower. Amendments such as lime, phosphorus, and organic matter can be incorporated into the soils at the time of tilling. These amendments render lead less mobile in the soil. In some soil, lime actually enhances the mobility of arsenic therefore additional testing of the soil with amendments would need to be performed. The contamination layer on this property and the low subsurface soil level does make tilling an option for the property. However, the soil contains heavy rock, therefore requiring tilling to go much deeper and more passes to get enough fine material into the mixtures in order to achieve the desired contamination levels in the mixture. In addition, through the process of tilling the soil rock is continually worked up to the surface. That creates additional tasks of collecting, removing, and disposing of the rock throughout the process. Considering the amount of rock removed through that process by deep tilling this property, you could expect to be dropping the elevation of the property approximately 4 inches. In addition, you would be left with a surface area that consists primarily of a sandy mixture with rock, void of organics suitable for successful planting and vegetative growth. Ultimately you may have to add topsoil with suitable organic matter to establish even field standard level of vegetative coverage on the property.

Deep tilling on this property when considering the conditions would cost in the $15,000 range per acre. If it were necessary to import a 4 inch material layer of replacement soils, that would be approximately an additional $15,000 per acre.

Removal and Replacement

The combination of the relatively thin layer of contamination and the poor quality and rocky soil conditions on the property make a thin removal and replacement of soils a primary option over a deep tilling option. The removal and replacement process would remove the contaminated soil down to an accepted level and provide an import material layer suitable for its intended use. The East Helena Residential Soils Program to date has operated under a program that involves post sampling. Meaning each section requires post sampling after the removal process to ensure the remaining surface levels meet the cleanup criteria. Given that factor along with the fact that the pit samples were taken from ten locations spread throughout the property, there remains a level of variability. It is reasonable to assume there would be sections where excavation would be sufficient at four inches in depth, where other sections could require excavation up to ten inches in depth to meet the cleanup criteria. Nonetheless, when considering all factors, an average excavation depth for the property of 6 to 7 inches would be a reasonable conclusion to achieve the desired cleanup levels.

The cost to remove and replace the soil on this property would be in the 35-40K per acre range. This estimate is using current market value and conditions and assumes a suitable storage area for remediated soils is available.

Summary

All data collected on this project was in accordance with the current Sampling and Analysis Plan used for the East Helena Residential Soils Project. The grid pattern established on the project can be easily recreated for remediation purposes or further soil investigation in the future.

In accordance with, *East Helena Superfund Site, Operable Unit #2, Residential Soils And Undeveloped Lands Final Record Of Decision, September 2009,* the entire property qualifies for remediation based on the surface levels over 500 ppm Pb.

All opinions reflected in the Remediation Factors, Remediation Options, and Summary sections of this report are from a construction perspective and are based on 20 years of experience not only in the remediation field but specifically on the East Helena Residential Soils Project.

Removal and replacement is the best option given the conditions on the property. More importantly, however, it is more protective of children. Tilling may be considered as an option by some given the cost difference in removal and replacement. But I would warn that the conditions left by tilling would require adding 4-6 inches in material at the time of development whether the use is for parking, activity fields, or common grounds areas. Removal and replacement is also more protective than tilling if you consider the barrier the backfill material provides. Example: If at the completion of tilling you had a surface averaging 300 ppm Pb and the placement of additional import material was not considered part of the remediation project, then 300 ppm Pb would be the surface exposure level. Whereas, in the case of removal and replacement, if at the completion of excavation you had that same 300 ppm Pb average, you would have six inches of backfill material that would cover that layer. Typically, backfill materials are in the 25-40 ppm Pb range for the area and that would be your exposure level.

The EPA has developed voluntary *School Siting Guidelines, October 2011* that are intended to encourage, inform and improve consideration of environmental factors in local school siting decision-making process without infringing on local decision-making authority.

The Lewis & Clark County Health Department Institutional Controls will be a further determining factor for dealing with levels of tolerable contamination. The Lewis and Clark County Health Department will play an important role in the final siting of the school property ensuring it meets all of the necessary protective factors associated with Human Health.

The EPA would be the ultimate authority and regulating agency and in conjunction with the DEQ and Lewis and Clark County would ultimately evaluate the property and make a determination on an approved remediation method. They thoroughly review the whole process including the overall protection of human health, compliance, permanence, reduction in toxicity, short term effectiveness, implementation, cost, state acceptance, and community acceptance, etc when considering remedial alternatives. This is a more complex situation with a property owned by one party (METG) and interest in a potential purchase by another party (East Helena School District). Also, consider the Trust, DOJ, DEQ, and EPA would likely all have to agree on whether a purchase price or offer from the East Helena Schools would be adequate to justify a sale. As shown in this report the entire property requires remediation and the estimated costs associated with that work have been provided herein.

Any purchase of such property should be reviewed on a cost analysis basis discovering all pertinent reductions in value due to the existing contamination and ROD requirements. Clearly, this is a complex situation with multiple parties involved and with numerous questions yet to be answered. That said, the school district is interested in purchasing the property, the proposed use would be a positive impact on the town and community as a whole, the owners of the land will be selling the property, and the EPA is involved in the process and has an interest in protecting human health.

References

- *Hydrometrics Inc. 1991b Sampling and Analysis Plan (SAP)*
- *East Helena Superfund Site, Operable Unit #2, Residential Soils And Undeveloped Lands Final Record Of Decision, September 2009(ROD)*
- *School Siting Guidelines, October 2011*

Analytical Tables

SURFACE SAMPLE ANALYTICAL TABLE

Laboratory ID	Client Sample ID	Depth	Pb	As	Cd
H13010124-001	Pre METV1-1	0-1	1580	148	19
H13010124-002	Pre METV1-2	0-1	1550	158	13
H13010124-003	Pre METV1-3	0-1	1360	152	12
H13010124-004	Pre METV1-4	0-1	1460	135	17
H13010124-005	Pre METV1-5	0-1	1350	126	18
H13010124-006	Pre METV1-6	0-1	1460	113	20
H13010124-007	Pre METV1-7	0-1	1660	133	28
H13010124-008	Pre METV1-8	0-1	1390	124	20
H13010124-009	Pre METV1-9	0-1	1350	114	22
H13010124-010	Pre METV1-10	0-1	965	88	23
H13010124-011	Pre METV1-11	0-1	1820	169	18
H13010124-012	Pre METV1-12	0-1	1670	162	14
H13010124-013	Pre METV1-13	0-1	1930	172	16
H13010124-014	Pre METV1-14	0-1	1820	183	14
H13010124-015	Pre METV1-15	0-1	1430	134	16
H13010125-001	Pre METV1-16	0-1	1510	142	20
H13010125-002	Pre METV1-17	0-1	1540	133	17
H13010125-003	Pre METV1-18	0-1	1290	116	18
H13010125-004	Pre METV1-19	0-1	1320	110	16
H13010125-005	Pre METV1-20	0-1	987	89	14
H13010125-006	Pre METV1-20d	0-1	1040	97	14
H13010125-007	Pre METV1-21	0-1	2190	193	20
H13010125-008	Pre METV1-22	0-1	1770	155	18
H13010125-009	Pre METV1-23	0-1	2150	160	29
H13010125-010	Pre METV1-24	0-1	1570	120	24
H13010125-011	Pre METV1-25	0-1	1640	117	29
H13010125-012	Pre METV1-26	0-1	1670	104	29
H13010125-013	Pre METV1-27	0-1	1270	87	22
H13010125-014	Pre METV1-28	0-1	1340	86	20
H13010125-015	Pre METV1-29	0-1	1090	81	22
H13010126-001	Pre METV1-30	0-1	1270	78	20
H13010126-002	Pre METV1-31	0-1	2290	144	33
H13010126-003	Pre METV1-32	0-1	1550	127	34
H13010126-004	Pre METV1-33	0-1	1250	92	27
H13010126-005	Pre METV1-34	0-1	1250	86	27
H13010126-006	Pre METV1-35	0-1	1250	97	27
H13010126-007	Pre METV1-36	0-1	1010	81	23
H13010126-008	Pre METV1-37	0-1	961	76	22
H13010126-009	Pre METV1-38	0-1	1080	76	25
H13010126-010	Pre METV1-39	0-1	784	61	19
H13010126-011	Pre METV1-40	0-1	884	61	21
H13010126-012	Pre METV1-40d	0-1	903	68	20
H13010126-013	Pre METV1-41	0-1	2520	185	30
H13010126-014	Pre METV1-42	0-1	2910	153	35
H13010126-015	Pre METV1-43	0-1	2050	123	36
H13010127-001	Pre METV1-44	0-1	1850	96	34
H13010127-002	Pre METV1-45	0-1	1400	96	29
H13010127-003	Pre METV1-46	0-1	1730	72	33
H13010127-004	Pre METV1-47	0-1	1240	80	26
H13010127-005	Pre METV1-48	0-1	1470	75	27
H13010127-006	Pre METV1-49	0-1	1400	89	28
H13010127-007	Pre METV1-50	0-1	1280	61	25
H13010127-008	Pre METV1-51	0-1	1740	135	27
H13010127-009	Pre METV1-52	0-1	1320	123	22
H13010127-010	Pre METV1-53	0-1	2070	84	42
H13010127-011	Pre METV1-54	0-1	1770	96	34
H13010121-009	Pre METV1-55	0-1	932	65	18
H13010121-010	Pre METV1-56	0-1	1040	80	24

PIT SAMPLE ANALYTICAL TABLE

Sample ID	Client Sample ID	Depth	Pb	As	Cd
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H13010127-013	Pre METV1-P1b	4-6	144	23	27
H13010127-014	Pre METV1-P1c	4-8	350	50	22
H13010127-015	Pre METV1-P1d	8-12	226	32	6
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H13010122-002	Pre METV1-P2b	4-6	30	8	2
H13010122-003	Pre METV1-P2bd	4-6	33	8	2
H13010122-004	Pre METV1-P2c	4-8	29	15	<1
H13010122-005	Pre METV1-P2d	8-12	34	13	<1
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H13010122-007	Pre METV1-P3b	4-6	53	15	4
H13010122-008	Pre METV1-P3c	4-8	84	18	5
H13010122-009	Pre METV1-P3d	8-12	50	15	<1
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H13010122-011	Pre METV1-P4b	4-6	519	82	16
H13010122-012	Pre METV1-P4c	4-8	245	55	20
H13010122-013	Pre METV1-P4d	8-12	138	30	14
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H13010122-015	Pre METV1-P5b	4-6	54	24	5
H13010123-001	Pre METV1-P5c	4-8	66	23	10
H13010123-002	Pre METV1-P5d	8-12	46	15	4
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H13010123-004	Pre METV1-P6b	4-6	454	108	7
H13010123-005	Pre METV1-P6c	4-8	86	21	2
H13010123-006	Pre METV1-P6d	8-12	94	16	2
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H13010123-008	Pre METV1-P7b	4-6	435	67	7
H13010123-009	Pre METV1-P7bd	4-6	428	61	7
H13010123-010	Pre METV1-P7c	4-8	210	44	4
H13010123-011	Pre METV1-P7d	8-12	213	34	4
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H13010123-013	Pre METV1-P8b	4-6	120	29	3
H13010123-014	Pre METV1-P8c	4-8	134	26	3
H13010123-015	Pre METV1-P8d	8-12	34	11	<1
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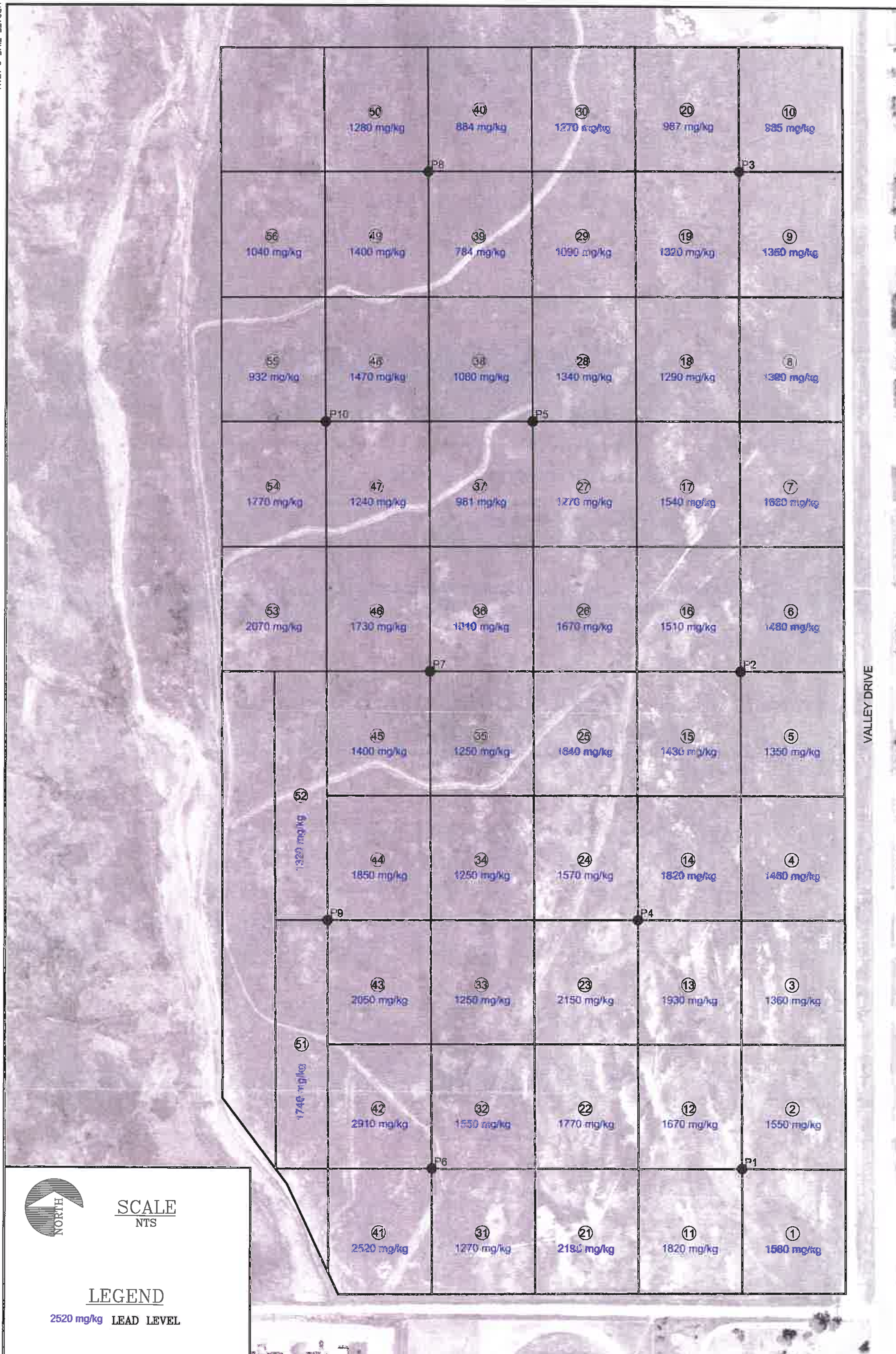
H13010121-002	Pre METV1-P9b	4-6	405	59	9
H13010121-003	Pre METV1-P9c	4-8	234	57	29
H13010121-004	Pre METV1-P9d	8-12	124	23	2
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
H13010121-006	Pre METV1-P10b	4-6	701	67	12
H13010121-007	Pre METV1-P10c	4-8	405	37	8
H13010121-008	Pre METV1-P10d	8-12	322	28	6

Grid Maps



METG PROPERTY
EAST HELENA, MONTANA

SURFACE SAMPLE LEAD LEVELS

FIGURE 1-0

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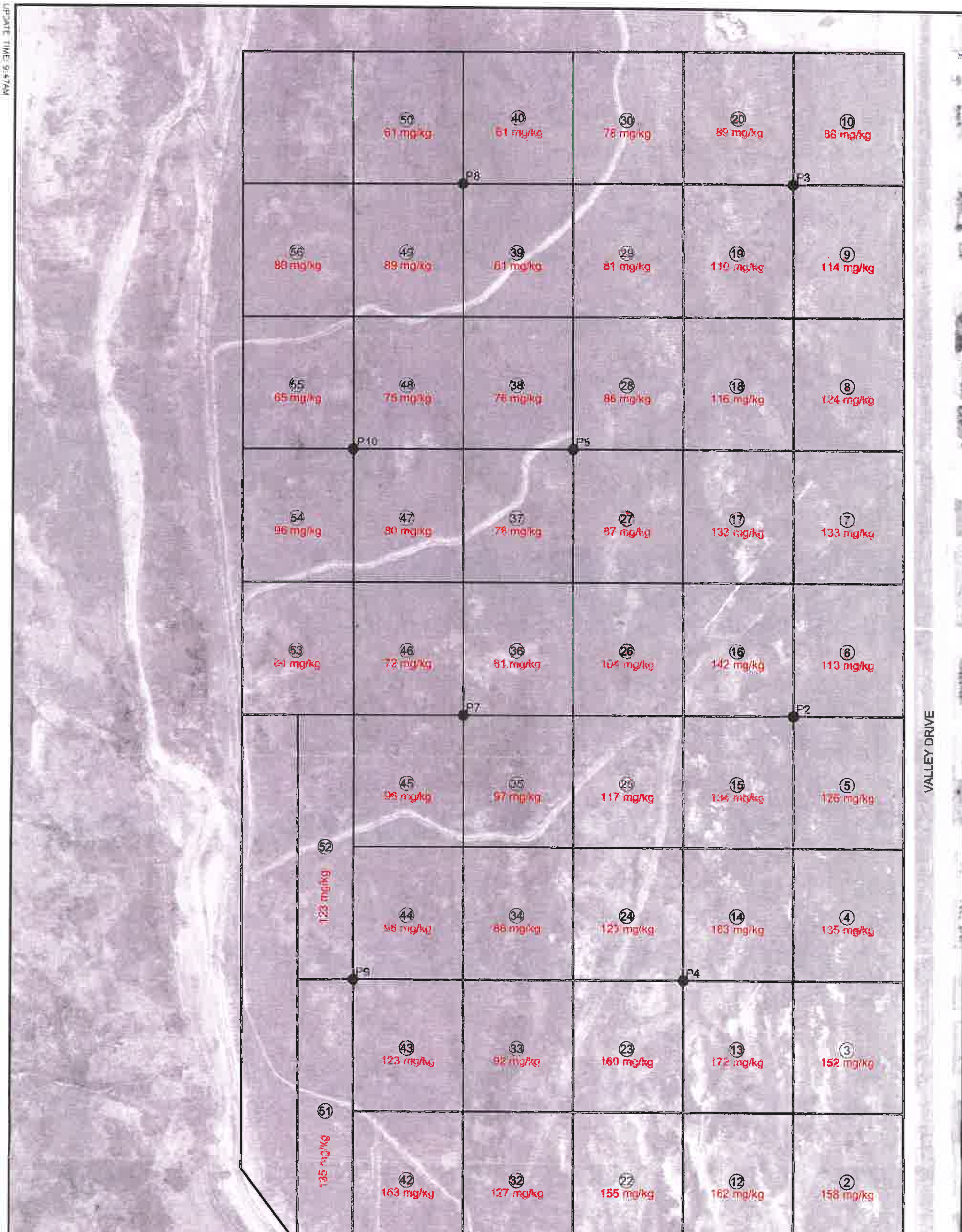

SCALE
NTS

LEGEND
185 mg/kg ARSENIC LEVEL

METG PROPERTY
EAST HELENA, MONTANA

SURFACE SAMPLE ARSENIC LEVELS

FIGURE
2-0

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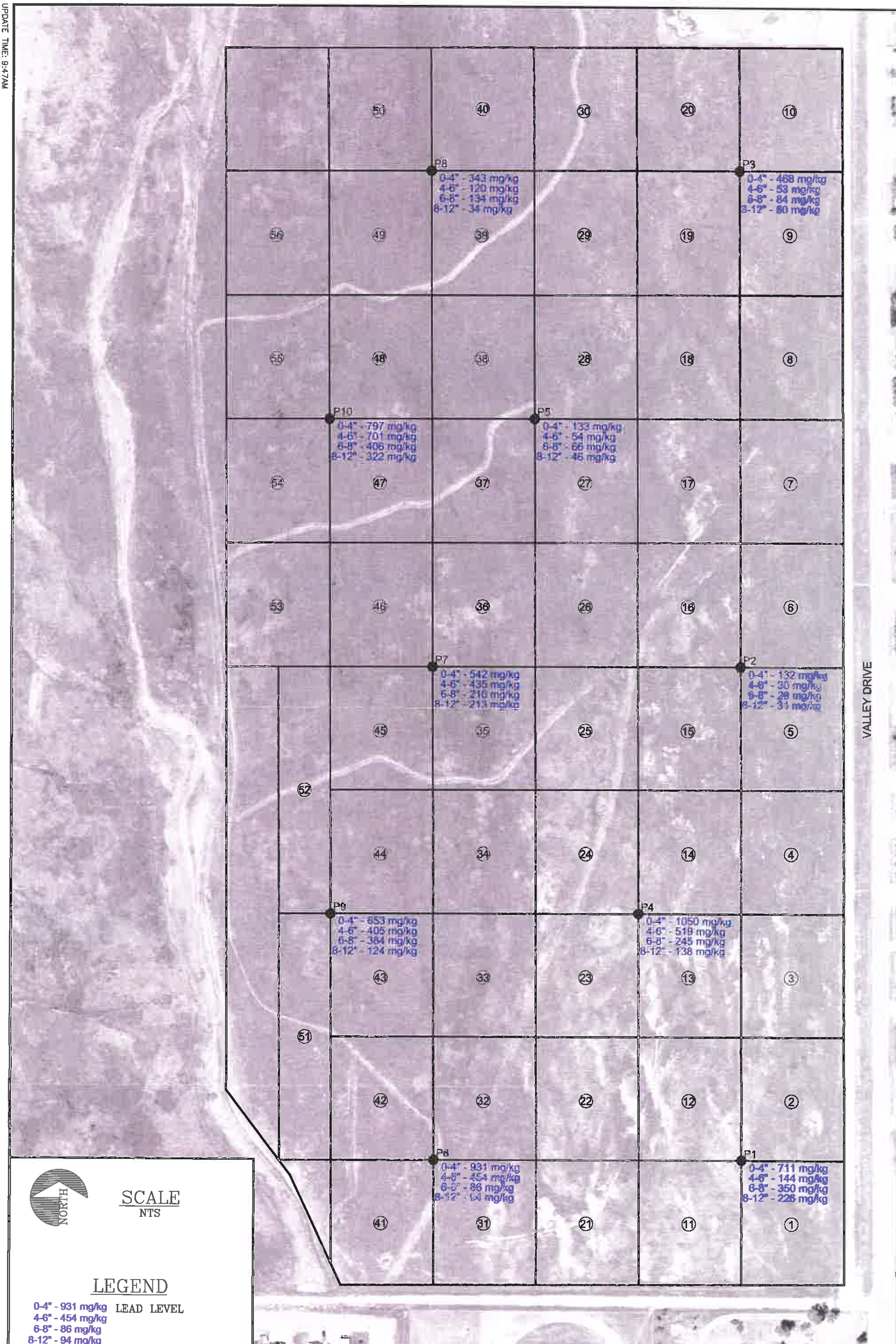

METG PROPERTY
EAST HELENA, MONTANA

PIT SAMPLE LEAD LEVELS

FIGURE 3-0

UPDATE TIME: 9:47AM
0072\HEL\050106\I:\Land Projects\1232C301\DWG\1232C301H345.dwg

Analytical Data

ENERGY LABORATORIES
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Helena, MT 877-472-0711 • Billings, MT 800-735-4489 • Casper, WY 888-235-0515
Gillette, WY 866-686-7175 • Rapid City, SD 888-672-1225 • College Station, TX 888-690-2218

ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010124

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010124-001	Pre METV1-1 0-1" [0-1]	10/22/12 9:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010124-002	Pre METV1-2 0-1" [0-1]	10/22/12 9:30	01/08/13	Soil	Same As Above
H13010124-003	Pre METV1-3 0-1" [0-1]	10/22/12 10:00	01/08/13	Soil	Same As Above
H13010124-004	Pre METV1-4 0-1" [0-1]	10/22/12 10:30	01/08/13	Soil	Same As Above
H13010124-005	Pre METV1-5 0-1" [0-1]	10/22/12 11:00	01/08/13	Soil	Same As Above
H13010124-006	Pre METV1-6 0-1" [0-1]	10/22/12 11:30	01/08/13	Soil	Same As Above
H13010124-007	Pre METV1-7 0-1" [0-1]	10/22/12 12:00	01/08/13	Soil	Same As Above
H13010124-008	Pre METV1-8 0-1" [0-1]	10/22/12 13:30	01/08/13	Soil	Same As Above
H13010124-009	Pre METV1-9 0-1" [0-1]	10/22/12 14:00	01/08/13	Soil	Same As Above
H13010124-010	Pre METV1-10 0-1" [0-1]	10/22/12 14:30	01/08/13	Soil	Same As Above
H13010124-011	Pre METV1-11 0-1" [0-1]	10/22/12 15:00	01/08/13	Soil	Same As Above
H13010124-012	Pre METV1-12 0-1" [0-1]	10/22/12 15:30	01/08/13	Soil	Same As Above
H13010124-013	Pre METV1-13 0-1" [0-1]	10/22/12 16:00	01/08/13	Soil	Same As Above
H13010124-014	Pre METV1-14 0-1" [0-1]	10/23/12 8:00	01/08/13	Soil	Same As Above
H13010124-015	Pre METV1-15 0-1" [0-1]	10/23/12 8:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 11:21:28 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010124

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010124-001	Pre METV1-1 0-1"	0	1	148	19	1580
H13010124-002	Pre METV1-2 0-1"	0	1	158	13	1550
H13010124-003	Pre METV1-3 0-1"	0	1	152	12	1360
H13010124-004	Pre METV1-4 0-1"	0	1	135	17	1460
H13010124-005	Pre METV1-5 0-1"	0	1	126	18	1350
H13010124-006	Pre METV1-6 0-1"	0	1	113	20	1460
H13010124-007	Pre METV1-7 0-1"	0	1	133	28	1660
H13010124-008	Pre METV1-8 0-1"	0	1	124	20	1390
H13010124-009	Pre METV1-9 0-1"	0	1	114	22	1350
H13010124-010	Pre METV1-10 0-1"	0	1	88	23	965
H13010124-011	Pre METV1-11 0-1"	0	1	169	18	1820
H13010124-012	Pre METV1-12 0-1"	0	1	162	14	1670
H13010124-013	Pre METV1-13 0-1"	0	1	172	16	1930
H13010124-014	Pre METV1-14 0-1"	0	1	183	14	1820
H13010124-015	Pre METV1-15 0-1"	0	1	134	16	1430

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010124

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130114B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/14/13 11:35
Arsenic		0.795	mg/L	0.0092	99	90	110			
Cadmium		0.392	mg/L	0.0010	98	90	110			
Lead		0.774	mg/L	0.013	97	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/14/13 11:50
Arsenic		-0.00599	mg/L	0.0092		0	0			
Cadmium		0.00206	mg/L	0.0010		0	0			
Lead		0.0189	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/14/13 11:54
Arsenic		1.09	mg/L	0.0092	109	80	120			
Cadmium		0.917	mg/L	0.0010	92	80	120			
Lead		0.980	mg/L	0.013	98	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/17/13
Work Order: H13010124

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19233
Sample ID: MB-19233	3	Method Blank				Run: ICP2-HE_130114B				01/14/13 13:31
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19233	3	Laboratory Fortified Blank				Run: ICP2-HE_130114B				01/14/13 13:35
Arsenic		50.2	mg/kg	1.0	100	80	120			
Cadmium		24.8	mg/kg	1.0	99	80	120			
Lead		49.1	mg/kg	1.0	98	80	120			
Sample ID: LCS-19233	3	Laboratory Control Sample				Run: ICP2-HE_130114B				01/14/13 13:38
Arsenic		262	mg/kg	1.5	77	72.3	106.4			
Cadmium		112	mg/kg	1.0	83	73	105.1			
Lead		163	mg/kg	3.1	88	75.9	108.6			
Sample ID: H13010124-015AMS	3	Sample Matrix Spike				Run: ICP2-HE_130114B				01/14/13 14:59
Arsenic		169	mg/kg	1.5	71	75	125			S
Cadmium		38.2	mg/kg	1.0	90	75	125			
Lead		1410	mg/kg	3.1		75	125			A
Sample ID: H13010124-015AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130114B				01/14/13 15:03
Arsenic		175	mg/kg	1.5	84	75	125	3.6	20	
Cadmium		39.9	mg/kg	1.0	97	75	125	4.5	20	
Lead		1450	mg/kg	3.1		75	125	3.2	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

S - Spike recovery outside of advisory limits.

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO: 1001

PROJECT NAME: EHSD-METV1

SAMPLERS: (Signature)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER		NO. OF CONTANINERS	Pb, As, Cd						REMARKS
10/22/12		0900	X		Pre METV1-1	(0-1")	1	✓						H1210124
10/22/12		0930	X		Pre METV1-2	(0-1")	1	✓						
10/22/12		1000	X		Pre METV1-3	(0-1")	1	✓						
10/22/12		1030	X		Pre METV1-4	(0-1")	1	✓						
10/22/12		1100	X		Pre METV1-5	(0-1")	1	✓						
10/22/12		1130	X		Pre METV1-6	(0-1")	1	✓						
10/22/12		1200	X		Pre METV1-7	(0-1")	1	✓						
10/22/12		1330	X		Pre METV1-8	(0-1")	1	✓						
10/22/12		1400	X		Pre METV1-9	(0-1")	1	✓						
10/22/12		1430	X		Pre METV1-10	(0-1")	1	✓						
10/22/12		1500	X		Pre METV1-11	(0-1")	1	✓						
10/22/12		1530	X		Pre METV1-12	(0-1")	1	✓						
10/22/12		1600	X		Pre METV1-13	(0-1")	1	✓						
10/23/12		0800	X		Pre METV1-14	(0-1")	1	✓						
10/23/12		0830	X		Pre METV1-15	(0-1")	1	✓						

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	Shipped via: FedEx, Ups Or other ______ Air Bill # ______
	11/8/13 16:08			
Relinquished (Signature)	**Date/Time**	**Received by: (Signature)**	**Remarks**	
			Temp 12.3 °C TB/ice	
Relinquished (Signature)	**Date/Time**	**Received by: (Signature)**	**Date/Time**	**Enclosed:** [ ] Parameter List with DTLs [ ] Cover Letter
		Esther Merritt	11-8-13 16:08	

Split Samples:

[ ] Accepted [ ] Declined ______

ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010125

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010125-001	Pre METV1-16 0-1" [0-1]	10/23/12 9:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010125-002	Pre METV1-17 0-1" [0-1]	10/23/12 9:30	01/08/13	Soil	Same As Above
H13010125-003	Pre METV1-18 0-1" [0-1]	10/23/12 10:00	01/08/13	Soil	Same As Above
H13010125-004	Pre METV1-19 0-1" [0-1]	10/23/12 10:30	01/08/13	Soil	Same As Above
H13010125-005	Pre METV1-20 0-1" [0-1]	10/23/12 11:00	01/08/13	Soil	Same As Above
H13010125-006	Pre METV1-20d 0-1" [0-1]	10/23/12 11:30	01/08/13	Soil	Same As Above
H13010125-007	Pre METV1-21 0-1" [0-1]	10/23/12 13:30	01/08/13	Soil	Same As Above
H13010125-008	Pre METV1-22 0-1" [0-1]	10/23/12 14:00	01/08/13	Soil	Same As Above
H13010125-009	Pre METV1-23 0-1" [0-1]	10/23/12 14:30	01/08/13	Soil	Same As Above
H13010125-010	Pre METV1-24 0-1" [0-1]	10/23/12 15:00	01/08/13	Soil	Same As Above
H13010125-011	Pre METV1-25 0-1" [0-1]	10/23/12 15:30	01/08/13	Soil	Same As Above
H13010125-012	Pre METV1-26 0-1" [0-1]	10/24/12 11:00	01/08/13	Soil	Same As Above
H13010125-013	Pre METV1-27 0-1" [0-1]	10/24/12 11:30	01/08/13	Soil	Same As Above
H13010125-014	Pre METV1-28 0-1" [0-1]	10/24/12 12:00	01/08/13	Soil	Same As Above
H13010125-015	Pre METV1-29 0-1" [0-1]	10/24/12 13:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 11:25:48 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010125

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010125-001	Pre METV1-16 0-1"	0	1	142	20	1510
H13010125-002	Pre METV1-17 0-1"	0	1	133	17	1540
H13010125-003	Pre METV1-18 0-1"	0	1	116	18	1290
H13010125-004	Pre METV1-19 0-1"	0	1	110	16	1320
H13010125-005	Pre METV1-20 0-1"	0	1	89	14	987
H13010125-006	Pre METV1-20d 0-1"	0	1	97	14	1040
H13010125-007	Pre METV1-21 0-1"	0	1	193	20	2190
H13010125-008	Pre METV1-22 0-1"	0	1	155	18	1770
H13010125-009	Pre METV1-23 0-1"	0	1	160	29	2150
H13010125-010	Pre METV1-24 0-1"	0	1	120	24	1570
H13010125-011	Pre METV1-25 0-1"	0	1	117	29	1640
H13010125-012	Pre METV1-26 0-1"	0	1	104	29	1670
H13010125-013	Pre METV1-27 0-1"	0	1	87	22	1270
H13010125-014	Pre METV1-28 0-1"	0	1	86	20	1340
H13010125-015	Pre METV1-29 0-1"	0	1	81	22	1090

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/17/13
Work Order: H13010125

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130114B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/14/13 11:35
Arsenic		0.795	mg/L	0.0092	99	90	110			
Cadmium		0.392	mg/L	0.0010	98	90	110			
Lead		0.774	mg/L	0.013	97	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/14/13 11:50
Arsenic		-0.00599	mg/L	0.0092		0	0			
Cadmium		0.00206	mg/L	0.0010		0	0			
Lead		0.0189	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/14/13 11:54
Arsenic		1.09	mg/L	0.0092	109	80	120			
Cadmium		0.917	mg/L	0.0010	92	80	120			
Lead		0.980	mg/L	0.013	98	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010125

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19234
Sample ID: MB-19234	3	Method Blank				Run: ICP2-HE_130114B				01/14/13 15:06
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19234	3	Laboratory Fortified Blank				Run: ICP2-HE_130114B				01/14/13 15:10
Arsenic		50.4	mg/kg	1.0	101	80	120			
Cadmium		24.9	mg/kg	1.0	100	80	120			
Lead		50.0	mg/kg	1.0	100	80	120			
Sample ID: LCS-19234	3	Laboratory Control Sample				Run: ICP2-HE_130114B				01/14/13 15:14
Arsenic		273	mg/kg	1.5	81	72.3	106.4			
Cadmium		118	mg/kg	1.0	88	73	105.1			
Lead		170	mg/kg	3.0	93	75.9	108.6			
Sample ID: H13010125-015AMS	3	Sample Matrix Spike				Run: ICP2-HE_130114B				01/14/13 17:01
Arsenic		125	mg/kg	1.5	89	75	125			
Cadmium		45.3	mg/kg	1.0	92	75	125			
Lead		1140	mg/kg	3.1		75	125			A
Sample ID: H13010125-015AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130114B				01/14/13 17:04
Arsenic		128	mg/kg	1.5	95	75	125	2.2	20	
Cadmium		47.9	mg/kg	1.0	103	75	125	5.6	20	
Lead		1210	mg/kg	3.1		75	125	5.8	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

SDL Enterprises — H13010125

Login completed by: Wanda Johnson
Reviewed by: BL2000\sdull
Reviewed Date: 1/10/2013

Date Received: 1/8/2013
Received by: elm
Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO 1001

PROJECT NAME EHSD-METVI

SAMPLERS: (Signature)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Pb, As, Cd						REMARKS
10/23/12		0900	X		Pre METVI-16 (0-1")	1	✓						H130/0125
10/23/12		0930	X		Pre METVI-17 (0-1")	1	✓						
10/23/12		1000	X		Pre METVI-18 (0-1")	1	✓						
10/23/12		1030	X		Pre METVI-19 (0-1")	1	✓						
10/23/12		1100	X		Pre METVI-20 (0-1")	1	✓						
10/23/12		1130	X		Pre METVI-20d (0-1")	1	✓						
10/23/12		1330	X		Pre METVI-21 (0-1")	1	✓						
10/23/12		1400	X		Pre METVI-22 (0-1")	1	✓						
10/23/12		1430	X		Pre METVI-23 (0-1")	1	✓						
10/23/12		1500	X		Pre METVI-24 (0-1")	1	✓						
10/23/12		1530	X		Pre METVI-25 (0-1")	1	✓						
10/24/12		1100	X		Pre METVI-26 (0-1")	1	✓						
10/24/12		1130	X		Pre METVI-27 (0-1")	1	✓						
10/24/12		1200	X		Pre METVI-28 (0-1")	1	✓						
10/24/12		1330	X		Pre METVI-29 (0-1")	1	✓						

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	Shipped via: FedEx, Ups Or other ______ Air Bill # ______
[signature]	1/8/13 1609			
Relinquished (Signature)	Date/Time	Received by: (Signature)	Remarks Temp 12.3 ETB/ice	
Relinquished (Signature)	Date/Time	Received by: (Signature) Esther Kleinett	Date/Time 1-8-13 16:19	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter

Split Samples:
[ ] Accepted [ ] Declined______

ENERGY LABORATORIES
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Helena, MT 877-472-0711 • Billings, MT 800-735-4489 • Casper, WY 888-235-0515
Gillette, WY 866-686-7175 • Rapid City, SD 888-672-1225 • College Station, TX 888-690-2218

ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010126

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010126-001	Pre METV1-30 (0-1")	10/24/12 14:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010126-002	Pre METV1-31 (0-1")	10/24/12 14:30	01/08/13	Soil	Same As Above
H13010126-003	Pre METV1-32 (0-1")	10/24/12 15:00	01/08/13	Soil	Same As Above
H13010126-004	Pre METV1-33 (0-1")	10/24/12 15:30	01/08/13	Soil	Same As Above
H13010126-005	Pre METV1-34 (0-1")	10/25/12 10:00	01/08/13	Soil	Same As Above
H13010126-006	Pre METV1-35 (0-1")	10/25/12 10:30	01/08/13	Soil	Same As Above
H13010126-007	Pre METV1-36 (0-1")	10/25/12 11:00	01/08/13	Soil	Same As Above
H13010126-008	Pre METV1-37 (0-1")	10/25/12 11:30	01/08/13	Soil	Same As Above
H13010126-009	Pre METV1-38 (0-1")	10/25/12 12:00	01/08/13	Soil	Same As Above
H13010126-010	Pre METV1-39 (0-1")	10/25/12 13:30	01/08/13	Soil	Same As Above
H13010126-011	Pre METV1-40 (0-1")	10/25/12 14:00	01/08/13	Soil	Same As Above
H13010126-012	Pre METV1-40d (0-1")	10/25/12 14:30	01/08/13	Soil	Same As Above
H13010126-013	Pre METV1-41 (0-1")	10/25/12 15:00	01/08/13	Soil	Same As Above
H13010126-014	Pre METV1-42 (0-1")	10/26/12 10:00	01/08/13	Soil	Same As Above
H13010126-015	Pre METV1-43 (0-1")	10/26/12 10:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 11:28:18 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010126

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010126-001	Pre METV1-30 (0-1")	0	0	78	20	1270
H13010126-002	Pre METV1-31 (0-1")	0	0	144	33	2290
H13010126-003	Pre METV1-32 (0-1")	0	0	127	34	1550
H13010126-004	Pre METV1-33 (0-1")	0	0	92	27	1250
H13010126-005	Pre METV1-34 (0-1")	0	0	86	27	1250
H13010126-006	Pre METV1-35 (0-1")	0	0	97	27	1250
H13010126-007	Pre METV1-36 (0-1")	0	0	81	23	1010
H13010126-008	Pre METV1-37 (0-1")	0	0	76	22	961
H13010126-009	Pre METV1-38 (0-1")	0	0	76	25	1080
H13010126-010	Pre METV1-39 (0-1")	0	0	61	19	784
H13010126-011	Pre METV1-40 (0-1")	0	0	61	21	884
H13010126-012	Pre METV1-40d (0-1")	0	0	68	20	903
H13010126-013	Pre METV1-41 (0-1")	0	0	185	30	2520
H13010126-014	Pre METV1-42 (0-1")	0	0	153	35	2910
H13010126-015	Pre METV1-43 (0-1")	0	0	123	36	2050

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Report Date: 01/17/13
Project: 1001 EHSD METV1
Work Order: H13010126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130115B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/15/13 10:02
Arsenic		0.787	mg/L	0.0092	98	90	110			
Cadmium		0.395	mg/L	0.0010	99	90	110			
Lead		0.783	mg/L	0.013	98	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/15/13 10:17
Arsenic		-0.00129	mg/L	0.0092		0	0			
Cadmium		-0.00354	mg/L	0.0010		0	0			
Lead		-0.00340	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/15/13 10:21
Arsenic		1.08	mg/L	0.0092	108	80	120			
Cadmium		0.907	mg/L	0.0010	91	80	120			
Lead		0.955	mg/L	0.013	95	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010126

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19244
Sample ID: MB-19244	3	Method Blank				Run: ICP2-HE_130115B				01/15/13 11:18
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19244	3	Laboratory Fortified Blank				Run: ICP2-HE_130115B				01/15/13 11:22
Arsenic		47.0	mg/kg	1.0	94	80	120			
Cadmium		23.3	mg/kg	1.0	93	80	120			
Lead		45.8	mg/kg	1.0	92	80	120			
Sample ID: LCS-19244	3	Laboratory Control Sample				Run: ICP2-HE_130115B				01/15/13 11:25
Arsenic		275	mg/kg	1.5	80	72.3	106.4			
Cadmium		116	mg/kg	1.0	85	73	105.1			
Lead		169	mg/kg	3.1	91	75.9	108.6			
Sample ID: H13010126-015AMS	3	Sample Matrix Spike				Run: ICP2-HE_130115B				01/15/13 12:45
Arsenic		156	mg/kg	1.5	67	75	125			S
Cadmium		52.8	mg/kg	1.0	70	75	125			S
Lead		1930	mg/kg	3.1		75	125			A
Sample ID: H13010126-015AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130115B				01/15/13 12:49
Arsenic		158	mg/kg	1.5	72	75	125	1.5	20	S
Cadmium		53.3	mg/kg	1.0	72	75	125	0.9	20	S
Lead		1910	mg/kg	3.1		75	125	1.1	20	A

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

S - Spike recovery outside of advisory limits.

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

SDL Enterprises

H13010126

Login completed by: Esther L. Merritt

Reviewed by: BL2000\sdull

Reviewed Date: 1/10/2013

Date Received: 1/8/2013

Received by: elm

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO	PROJECT NAME
1001	EHSD-METV1

SAMPLERS: (*Signature*)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER		NO. OF CONTAINERS	Pb, As, Cd						REMARKS
10/24/12		1400	X		Pre METV1-30	(0-1")	1	✓						H13010126
10/24/12		1430	X		Pre METV1-31	(0-1")	1	✓						
10/24/12		1500	X		Pre METV1-32	(0-1")	1	✓						
10/24/12		1530	X		Pre METV1-33	(0-1")	1	✓						
10/25/12		1000	X		Pre METV1-34	(0-1")	1	✓						
10/25/12		1030	X		Pre METV1-35	(0-1")	1	✓						
10/25/12		1100	X		Pre METV1-36	(0-1")	1	✓						
10/25/12		1130	X		Pre METV1-37	(0-1")	1	✓						
10/25/12		1200	X		Pre METV1-38	(0-1")	1	✓						
10/25/12		1330	X		Pre METV1-39	(0-1")	1	✓						
10/25/12		1400	X		Pre METV1-40	(0-1")	1	✓						
10/25/12		1430	X		Pre METV1-40d	(0-1")	1	✓						
10/25/12		1500	X		Pre METV1-41	(0-1")	1	✓						
10/26/12		1000	X		Pre METV1-42	(0-1")	1	✓						
10/26/12		1030	X		Pre METV1-43	(0-1")	1	✓						

Relinquished (*Signature*)	Date/Time	Received by: (*Signature*)	LAB	Shipped via: FedEx, Ups Or other ____ Air Bill # ____
	1/8/13 16:07			
Relinquished (*Signature*)	Date/Time	Received by: (*Signature*)	Remarks Temp 2.3 OTB/ICE	
Relinquished (*Signature*)	Date/Time	Received by: (*Signature*) Esther Merritt	Date/Time 1-8-13 16:07	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter

Split Samples:
[ ] Accepted [ ] Declined________

ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010127

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010127-001	Pre METV1-44 0-1" [0-1]	10/26/12 11:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010127-002	Pre METV1-45 0-1" [0-1]	10/26/12 11:30	01/08/13	Soil	Same As Above
H13010127-003	Pre METV1-46 0-1" [0-1]	10/26/12 12:00	01/08/13	Soil	Same As Above
H13010127-004	Pre METV1-47 0-1" [0-1]	10/26/12 13:30	01/08/13	Soil	Same As Above
H13010127-005	Pre METV1-48 0-1" [0-1]	10/26/12 14:00	01/08/13	Soil	Same As Above
H13010127-006	Pre METV1-49 0-1" [0-1]	10/26/12 14:30	01/08/13	Soil	Same As Above
H13010127-007	Pre METV1-50 0-1" [0-1]	10/26/12 15:00	01/08/13	Soil	Same As Above
H13010127-008	Pre METV1-51 0-1" [0-1]	10/29/12 11:00	01/08/13	Soil	Same As Above
H13010127-009	Pre METV1-52 0-1" [0-1]	10/29/12 11:30	01/08/13	Soil	Same As Above
H13010127-010	Pre METV1-53 0-1" [0-1]	10/29/12 12:00	01/08/13	Soil	Same As Above
H13010127-011	Pre METV1-54 0-1" [0-1]	10/29/12 12:30	01/08/13	Soil	Same As Above
H13010127-012	Pre METV1-P1a 0-4" [0-4]	10/29/12 13:30	01/08/13	Soil	Same As Above
H13010127-013	Pre METV1-P1b 4-6" [4-6]	10/29/12 14:00	01/08/13	Soil	Same As Above
H13010127-014	Pre METV1-P1c 4-8" [4-8]	10/29/12 14:30	01/08/13	Soil	Same As Above
H13010127-015	Pre METV1-P1d 8-12" [8-12]	10/29/12 15:00	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 11:29:45 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010127

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010127-001	Pre METV1-44 0-1"	0	1	96	34	1850
H13010127-002	Pre METV1-45 0-1"	0	1	96	29	1400
H13010127-003	Pre METV1-46 0-1"	0	1	72	33	1730
H13010127-004	Pre METV1-47 0-1"	0	1	80	26	1240
H13010127-005	Pre METV1-48 0-1"	0	1	75	27	1470
H13010127-006	Pre METV1-49 0-1"	0	1	89	28	1400
H13010127-007	Pre METV1-50 0-1"	0	1	61	25	1280
H13010127-008	Pre METV1-51 0-1"	0	1	135	27	1740
H13010127-009	Pre METV1-52 0-1"	0	1	123	22	1320
H13010127-010	Pre METV1-53 0-1"	0	1	84	42	2070
H13010127-011	Pre METV1-54 0-1"	0	1	96	34	1770
H13010127-012	Pre METV1-P1a 0-4"	0	4	99	25	711
H13010127-013	Pre METV1-P1b 4-6"	4	6	23	27	144
H13010127-014	Pre METV1-P1c 4-8"	4	8	50	22	350
H13010127-015	Pre METV1-P1d 8-12"	8	12	32	6	226

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010127

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7									Analytical Run: ICP2-HE_130116A
Sample ID: ICV	Initial Calibration Verification Standard								01/16/13 08:57
Arsenic	0.808	mg/L	0.0092	101	90	110			
Cadmium	0.397	mg/L	0.0010	99	90	110			
Lead	0.809	mg/L	0.013	101	90	110			
Sample ID: ICSA	Interference Check Sample A								01/16/13 09:12
Arsenic	-0.00612	mg/L	0.0092		0	0			
Cadmium	0.000900	mg/L	0.0010		0	0			
Lead	0.0562	mg/L	0.013		0	0			
Sample ID: ICSAB	Interference Check Sample AB								01/16/13 09:16
Arsenic	1.11	mg/L	0.0092	111	80	120			
Cadmium	0.921	mg/L	0.0010	92	80	120			
Lead	0.965	mg/L	0.013	96	80	120			
Method: E200.7									Analytical Run: ICP2-HE_130117B
Sample ID: ICV	Initial Calibration Verification Standard								01/17/13 09:30
Arsenic	0.808	mg/L	0.0092	101	90	110			
Sample ID: ICSA	Interference Check Sample A								01/17/13 09:45
Arsenic	0.00487	mg/L	0.0092		0	0			
Sample ID: ICSAB	Interference Check Sample AB								01/17/13 09:49
Arsenic	1.10	mg/L	0.0092	110	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010127

Analyte	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B									Batch: 19245
Sample ID: MB-19245	Method Blank				Run: ICP2-HE_130116A				01/16/13 09:31
Arsenic	ND	mg/kg	0.4						
Cadmium	ND	mg/kg	0.01						
Lead	ND	mg/kg	1						
Sample ID: LFB-19245	Laboratory Fortified Blank				Run: ICP2-HE_130116A				01/16/13 09:35
Arsenic	50.3	mg/kg	1.0	101	80	120			
Cadmium	24.9	mg/kg	1.0	100	80	120			
Lead	51.4	mg/kg	1.0	103	80	120			
Sample ID: LCS-19245	Laboratory Control Sample				Run: ICP2-HE_130116A				01/16/13 09:39
Arsenic	287	mg/kg	1.5	84	72.3	106.4			
Cadmium	123	mg/kg	1.0	91	73	105.1			
Lead	186	mg/kg	3.1	100	75.9	108.6			
Sample ID: H13010127-015AMS	Sample Matrix Spike				Run: ICP2-HE_130116A				01/16/13 10:59
Arsenic	82.7	mg/kg	1.5	108	75	125			
Cadmium	29.2	mg/kg	1.0	95	75	125			
Lead	279	mg/kg	3.1		75	125			A
Sample ID: H13010127-015AMSD	Sample Matrix Spike Duplicate				Run: ICP2-HE_130116A				01/16/13 11:02
Arsenic	82.7	mg/kg	1.5	108	75	125	0.1	20	
Cadmium	28.9	mg/kg	1.0	94	75	125	0.8	20	
Lead	305	mg/kg	3.1		75	125	9.0	20	A
Method: SW6010B									Batch: 19245
Sample ID: MB-19245	Method Blank				Run: ICP2-HE_130117B				01/17/13 11:18
Arsenic	ND	mg/kg	0.4						
Cadmium	ND	mg/kg	0.01						
Lead	ND	mg/kg	1						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

SDL Enterprises

H13010127

Login completed by: Wanda Johnson

Reviewed by: BL2000\sdull

Reviewed Date: 1/10/2013

Date Received: 1/8/2013

Received by: elm

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO 1001

PROJECT NAME EHSD-METVI

SAMPLERS: (Signature) [signature]

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER		NO. OF CONTANINERS	Pb, As, Cd						REMARKS
10/26/12		1100	X		Pre METVI-44	(0-1")	1	✓						H1301027
10/26/12		1130	X		Pre METVI-45	(0-1")	1	✓						
10/26/12		1200	X		Pre METVI-46	(0-1")	1	✓						
10/26/12		1330	X		Pre METVI-47	(0-1")	1	✓						
10/26/12		1400	X		Pre METVI-48	(0-1")	1	✓						
10/26/12		1430	X		Pre METVI-49	(0-1")	1	✓						
10/26/12		1500	X		Pre METVI-50	(0-1")	1	✓						
10/29/12		1100	X		Pre METVI-51	(0-1")	1	✓						
10/29/12		1130	X		Pre METVI-52	(0-1")	1	✓						
10/29/12		1200	X		Pre METVI-53	(0-1")	1	✓						
10/29/12		1230	X		Pre METVI-54	(0-1")	1	✓						
10/29/12		1330		X	Pre METVI-P1a	(0-4")	1	✓						
10/29/12		1400		X	Pre METVI-P1b	(4-6")	1	✓						
10/29/12		1430		X	Pre METVI-P1c	(6-8")	1	✓						
10/29/12		1500		X	Pre METVI-P1d	(8-12")	1	✓						

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	Shipped via: FedEx, Ups Or other ______ Air Bill # ______
[signature]	1/8/13 16:06			
Relinquished (Signature)	Date/Time	Received by: (Signature)	Remarks Temp 12.3 °TB/ice	
Relinquished (Signature)	Date/Time	Received by: (Signature)	Date/Time	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter
		Esther Merritt	1-8-13 16:06	

Split Samples:
[ ] Accepted [ ] Declined______

ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010122

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010122-001	Pre METV1-P2a 0-4" [0-4]	10/29/12 15:30	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010122-002	Pre METV1-P2b 4-6" [4-6]	10/29/12 16:00	01/08/13	Soil	Same As Above
H13010122-003	Pre METV1-P2bd 4-6" [4-6]	10/29/12 16:30	01/08/13	Soil	Same As Above
H13010122-004	Pre METV1-P2c 4-8" [4-8]	10/29/12 17:00	01/08/13	Soil	Same As Above
H13010122-005	Pre METV1-P2d 8-12" [8-12]	10/29/12 17:30	01/08/13	Soil	Same As Above
H13010122-006	Pre METV1-P3a 0-4" [0-4]	10/30/12 9:00	01/08/13	Soil	Same As Above
H13010122-007	Pre METV1-P3b 4-6" [4-6]	10/30/12 9:30	01/08/13	Soil	Same As Above
H13010122-008	Pre METV1-P3c 4-8" [4-8]	10/30/12 10:00	01/08/13	Soil	Same As Above
H13010122-009	Pre METV1-P3d 8-12" [8-12]	10/30/12 10:30	01/08/13	Soil	Same As Above
H13010122-010	Pre METV1-P4a 0-4" [0-4]	10/30/12 11:00	01/08/13	Soil	Same As Above
H13010122-011	Pre METV1-P4b 4-6" [4-6]	10/30/12 11:30	01/08/13	Soil	Same As Above
H13010122-012	Pre METV1-P4c 4-8" [4-8]	10/30/12 12:00	01/08/13	Soil	Same As Above
H13010122-013	Pre METV1-P4d 8-12" [8-12]	10/30/12 12:30	01/08/13	Soil	Same As Above
H13010122-014	Pre METV1-P5a 0-4" [0-4]	10/31/12 14:00	01/08/13	Soil	Same As Above
H13010122-015	Pre METV1-P5b 4-6" [4-6]	10/31/12 14:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 10:46:53 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010122

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010122-001	Pre METV1-P2a 0-4"	0	4	47	6	132
H13010122-002	Pre METV1-P2b 4-6"	4	6	8	2	30
H13010122-003	Pre METV1-P2bd 4-6"	4	6	8	2	33
H13010122-004	Pre METV1-P2c 4-8"	4	8	15	< 1	29
H13010122-005	Pre METV1-P2d 8-12"	8	12	13	< 1	34
H13010122-006	Pre METV1-P3a 0-4"	0	4	85	12	468
H13010122-007	Pre METV1-P3b 4-6"	4	6	15	4	53
H13010122-008	Pre METV1-P3c 4-8"	4	8	18	5	84
H13010122-009	Pre METV1-P3d 8-12"	8	12	15	< 1	50
H13010122-010	Pre METV1-P4a 0-4"	0	4	151	12	1050
H13010122-011	Pre METV1-P4b 4-6"	4	6	82	16	519
H13010122-012	Pre METV1-P4c 4-8"	4	8	55	20	245
H13010122-013	Pre METV1-P4d 8-12"	8	12	30	14	138
H13010122-014	Pre METV1-P5a 0-4"	0	4	35	8	133
H13010122-015	Pre METV1-P5b 4-6"	4	6	24	5	54

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises **Report Date:** 01/17/13

Project: 1001 EHSD METV1 **Work Order:** H13010122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130111B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/11/13 10:42
Arsenic		0.814	mg/L	0.0092	102	90	110			
Cadmium		0.396	mg/L	0.0010	99	90	110			
Lead		0.754	mg/L	0.013	94	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/11/13 10:57
Arsenic		-0.0177	mg/L	0.0092		0	0			
Cadmium		0.00197	mg/L	0.0010		0	0			
Lead		0.0114	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/11/13 11:01
Arsenic		1.07	mg/L	0.0092	107	80	120			
Cadmium		0.902	mg/L	0.0010	90	80	120			
Lead		0.972	mg/L	0.013	97	80	120			
Method: E200.7										Analytical Run: ICP2-HE_130114B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/14/13 11:35
Arsenic		0.795	mg/L	0.0092	99	90	110			
Cadmium		0.392	mg/L	0.0010	98	90	110			
Lead		0.774	mg/L	0.013	97	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/14/13 11:50
Arsenic		-0.00599	mg/L	0.0092		0	0			
Cadmium		0.00206	mg/L	0.0010		0	0			
Lead		0.0189	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/14/13 11:54
Arsenic		1.09	mg/L	0.0092	109	80	120			
Cadmium		0.917	mg/L	0.0010	92	80	120			
Lead		0.980	mg/L	0.013	98	80	120			
Method: E200.7										Analytical Run: ICP2-HE_130115B
Sample ID: ICV		Initial Calibration Verification Standard								01/15/13 10:02
Arsenic		0.787	mg/L	0.0092	98	90	110			
Sample ID: ICSA		Interference Check Sample A								01/15/13 10:17
Arsenic		-0.00129	mg/L	0.0092		0	0			
Sample ID: ICSAB		Interference Check Sample AB								01/15/13 10:21
Arsenic		1.08	mg/L	0.0092	108	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/17/13
Work Order: H13010122

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19222
Sample ID: MB-19222	3	Method Blank				Run: ICP2-HE_130111B				01/11/13 11:58
Arsenic		0.7	mg/kg	0.4						
Cadmium		0.02	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19222	3	Laboratory Fortified Blank				Run: ICP2-HE_130111B				01/11/13 12:01
Arsenic		50.5	mg/kg	1.0	100	80	120			
Cadmium		24.5	mg/kg	1.0	98	80	120			
Lead		48.5	mg/kg	1.0	97	80	120			
Sample ID: LCS-19222	3	Laboratory Control Sample				Run: ICP2-HE_130111B				01/11/13 12:05
Arsenic		284	mg/kg	1.5	84	72.3	106.4			
Cadmium		120	mg/kg	1.0	89	73	105.1			
Lead		174	mg/kg	3.0	95	75.9	108.6			
Sample ID: H13010122-015AMS	3	Sample Matrix Spike				Run: ICP2-HE_130111B				01/11/13 13:26
Arsenic		69.1	mg/kg	1.5	90	75	125			
Cadmium		26.6	mg/kg	1.0	89	75	125			
Lead		96.9	mg/kg	3.1	106	75	125			
Sample ID: H13010122-015AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130111B				01/11/13 13:30
Arsenic		67.8	mg/kg	1.5	88	75	125	1.9	20	
Cadmium		25.3	mg/kg	1.0	84	75	125	5.2	20	
Lead		82.6	mg/kg	3.1	77	75	125	16	20	
Method: SW6010B										Batch: 19222
Sample ID: MB-19222	3	Method Blank				Run: ICP2-HE_130114B				01/14/13 12:35
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						
Method: SW6010B										Batch: 19222
Sample ID: MB-19222	3	Method Blank				Run: ICP2-HE_130115B				01/15/13 11:06
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

SDL Enterprises

H13010122

Login completed by: Wanda Johnson

Reviewed by: BL2000\sdull

Reviewed Date: 1/11/2013

Date Received: 1/8/2013

Received by: elm

Carrier name: Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

Sample ID on COC is Pre METV1-P2bd 4-6", bag states METV1-P2bd 8-12". Contacted client regarding difference. Wj 1/9/13

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO: 1001

PROJECT NAME: EHSD-METV-1

SAMPLERS: (Signature)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER		NO. OF CONTAINERS	Pb, As, Cd	REMARKS
10/29/12		1530		X	Pre METV1-P2a	0-4"	1	✓	H301D122
10/29/12		1600		X	Pre METV1-P2b	4-6"	1	✓	
10/29/12		1630		X	Pre METV1-P2bd	4-6"	1	✓	
10/29/12		1700		X	Pre METV1-P2c	4-8"	1	✓	
10/29/12		1730		X	Pre METV1-P2d	8-12"	1	✓	
10/30/12		0900		X	Pre METV1-P3a	0-4"	1	✓	
10/30/12		0930		X	Pre METV1-P3b	4-6"	1	✓	
10/30/12		1000		X	Pre METV1-P3c	4-8"	1	✓	
10/30/12		1030		X	Pre METV1-P3d	8-12"	1	✓	
10/30/12		1100		X	Pre METV1-P4a	0-4"	1	✓	
10/30/12		1130		X	Pre METV1-P4b	4-6"	1	✓	
10/30/12		1200		X	Pre METV1-P4c	4-8"	1	✓	
10/30/12		1230		X	Pre METV1-P4d	8-12"	1	✓	
10/31/12		1400		X	Pre METV1-P5a	0-4"	1	✓	
10/31/12		1430		X	Pre METV1-P5b	4-6"	1	✓	

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	
[signature]	1/8/13 16:05			Shipped via: FedEx, Ups Or other ______ Air Bill # ______
Relinquished (Signature)	Date/Time	Received by: (Signature)	Remarks: Temp 12.3 °C ice	
Relinquished (Signature)	Date/Time	Received by: (Signature) Esther Merced	Date/Time 1-8-13 16:05	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter

Split Samples:

[ ] Accepted [ ] Declined ______

ENERGY LABORATORIES
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ANALYTICAL SUMMARY REPORT

January 17, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010123

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 15 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010123-001	Pre METV1-P5c 4-8" [4-8]	10/31/12 15:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010123-002	Pre METV1-P5d 8-12" [8-12]	10/31/12 15:30	01/08/13	Soil	Same As Above
H13010123-003	Pre METV1-P6a 0-4" [0-4]	11/01/12 9:00	01/08/13	Soil	Same As Above
H13010123-004	Pre METV1-P6b 4-6" [4-6]	11/01/12 9:30	01/08/13	Soil	Same As Above
H13010123-005	Pre METV1-P6c 4-8" [4-8]	11/01/12 10:00	01/08/13	Soil	Same As Above
H13010123-006	Pre METV1-P6d 8-12" [8-12]	11/01/12 10:30	01/08/13	Soil	Same As Above
H13010123-007	Pre METV1-P7a 0-4" [0-4]	11/01/12 11:00	01/08/13	Soil	Same As Above
H13010123-008	Pre METV1-P7b 4-6" [4-6]	11/01/12 11:30	01/08/13	Soil	Same As Above
H13010123-009	Pre METV1-P7bd 4-6" [4-6]	11/01/12 12:00	01/08/13	Soil	Same As Above
H13010123-010	Pre METV1-P7c 4-8" [4-8]	11/01/12 12:30	01/08/13	Soil	Same As Above
H13010123-011	Pre METV1-P7d 8-12" [8-12]	11/01/12 13:00	01/08/13	Soil	Same As Above
H13010123-012	Pre METV1-P8a 0-4" [0-4]	11/02/12 9:00	01/08/13	Soil	Same As Above
H13010123-013	Pre METV1-P8b 4-6" [4-6]	11/02/12 9:30	01/08/13	Soil	Same As Above
H13010123-014	Pre METV1-P8c 4-8" [4-8]	11/02/12 10:00	01/08/13	Soil	Same As Above
H13010123-015	Pre METV1-P8d 8-12" [8-12]	11/02/12 10:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By:

Amanda Blackburn
Assistant Branch Manager - Helena, MT

Digitally signed by
Amanda B. Blackburn
Date: 2013.01.18 11:20:01 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010123

Report Date: 01/17/13
Date Received: 01/08/13

		Analysis		As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010123-001	Pre METV1-P5c 4-8"	4	8	23	10	66
H13010123-002	Pre METV1-P5d 8-12"	8	12	15	4	46
H13010123-003	Pre METV1-P6a 0-4"	0	4	106	24	931
H13010123-004	Pre METV1-P6b 4-6"	4	6	108	7	454
H13010123-005	Pre METV1-P6c 4-8"	4	8	21	2	86
H13010123-006	Pre METV1-P6d 8-12"	8	12	16	2	94
H13010123-007	Pre METV1-P7a 0-4"	0	4	70	14	542
H13010123-008	Pre METV1-P7b 4-6"	4	6	67	7	435
H13010123-009	Pre METV1-P7bd 4-6"	4	6	61	7	428
H13010123-010	Pre METV1-P7c 4-8"	4	8	44	4	210
H13010123-011	Pre METV1-P7d 8-12"	8	12	34	4	213
H13010123-012	Pre METV1-P8a 0-4"	0	4	59	9	343
H13010123-013	Pre METV1-P8b 4-6"	4	6	29	3	120
H13010123-014	Pre METV1-P8c 4-8"	4	8	26	3	134
H13010123-015	Pre METV1-P8d 8-12"	8	12	11	< 1	34

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises

Project: 1001 EHSD METV1

Report Date: 01/17/13

Work Order: H13010123

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130111B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/11/13 10:42
Arsenic		0.814	mg/L	0.0092	102	90	110			
Cadmium		0.396	mg/L	0.0010	99	90	110			
Lead		0.754	mg/L	0.013	94	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/11/13 10:57
Arsenic		-0.0177	mg/L	0.0092		0	0			
Cadmium		0.00197	mg/L	0.0010		0	0			
Lead		0.0114	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/11/13 11:01
Arsenic		1.07	mg/L	0.0092	107	80	120			
Cadmium		0.902	mg/L	0.0010	90	80	120			
Lead		0.972	mg/L	0.013	97	80	120			
Method: E200.7										Analytical Run: ICP2-HE_130114B
Sample ID: ICV		Initial Calibration Verification Standard								01/14/13 11:35
Arsenic		0.795	mg/L	0.0092	99	90	110			
Sample ID: ICSA		Interference Check Sample A								01/14/13 11:50
Arsenic		-0.00599	mg/L	0.0092		0	0			
Sample ID: ICSAB		Interference Check Sample AB								01/14/13 11:54
Arsenic		1.09	mg/L	0.0092	109	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/17/13
Work Order: H13010123

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19223
Sample ID: MB-19223	3	Method Blank				Run: ICP2-HE_130111B				01/11/13 13:33
Arsenic		ND	mg/kg	0.4						
Cadmium		0.03	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19223	3	Laboratory Fortified Blank				Run: ICP2-HE_130111B				01/11/13 13:37
Arsenic		49.4	mg/kg	1.0	99	80	120			
Cadmium		23.7	mg/kg	1.0	95	80	120			
Lead		47.7	mg/kg	1.0	95	80	120			
Sample ID: LCS-19223	3	Laboratory Control Sample				Run: ICP2-HE_130111B				01/11/13 13:41
Arsenic		281	mg/kg	1.5	83	72.3	106.4			
Cadmium		115	mg/kg	1.0	85	73	105.1			
Lead		169	mg/kg	3.1	91	75.9	108.6			
Sample ID: H13010123-015AMS	3	Sample Matrix Spike				Run: ICP2-HE_130111B				01/11/13 15:28
Arsenic		56.1	mg/kg	1.5	90	75	125			
Cadmium		23.5	mg/kg	1.0	94	75	125			
Lead		76.3	mg/kg	3.1	85	75	125			
Sample ID: H13010123-015AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130111B				01/11/13 15:32
Arsenic		59.5	mg/kg	1.5	97	75	125	6.0	20	
Cadmium		23.5	mg/kg	1.0	94	75	125	0.1	20	
Lead		71.4	mg/kg	3.1	75	75	125	6.6	20	
Method: SW6010B										Batch: 19223
Sample ID: MB-19223	3	Method Blank				Run: ICP2-HE_130114B				01/14/13 13:01
Arsenic		0.5	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

Standard Reporting Procedures

Lab measurement of analytes considered field parameters that require analysis within 15 minutes of sampling such as pH, Dissolved Oxygen and Residual Chlorine, are qualified as being analyzed outside of recommended holding time.

Solid/soil samples are reported on a wet weight basis (as received) unless specifically indicated. If moisture corrected, data units are typically noted as –dry. For agricultural and mining soil parameters/characteristics, all samples are dried and ground prior to sample analysis.

Workorder Receipt Checklist

SDL Enterprises

H13010123

Login completed by:	Wanda Johnson	Date Received:	1/8/2013
Reviewed by:	BL2000\sdull	Received by:	elm
Reviewed Date:	1/10/2013	Carrier name:	Hand Del

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time? (Exclude analyses that are considered field parameters such as pH, DO, Res Cl, Sulfite, Ferrous Iron, etc.)	Yes ☑	No ☐	
Temp Blank received?	Yes ☐	No ☑	Not Applicable ☐
Container/Temp Blank temperature:	12.3°C No Ice		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☐	No ☐	Not Applicable ☑

Contact and Corrective Action Comments:

None

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO	PROJECT NAME
1101	EHSD-METVI

SAMPLERS: (Signature)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER	NO. OF CONTAINERS	Pb, As, Cd						REMARKS
10/31/12		1500		X	Pre METVI-P5c 4-8"	1	✓						H1301D123
10/31/12		1530		X	Pre METVI-P5d 8-12"	1	✓						
11/1/12		0900		X	Pre METVI-P6a (0-4")	1	✓						
11/1/12		0930		X	Pre METVI-P6b 4-6	1	✓						
11/1/12		1000		X	Pre METVI-P6c 4-8	1	✓						
11/1/12		1030		X	Pre METVI-P6d 8-12	1	✓						
11/1/12		1100		X	Pre METVI-P7a 0-4	1	✓						
11/1/12		1130		X	Pre METVI-P7b 4-6	1	✓						
11/1/12		1200		X	Pre METVI-P7bd 4-6	1	✓						
11/1/12		1230		X	Pre METVI-P7c 4-8	1	✓						
11/1/12		1300		X	Pre METVI-P7d 8-12	1	✓						
11/2/12		0900		X	Pre METVI-P8a 0-4	1	✓						
11/2/12		0930		X	Pre METVI-P8b 4-6	1	✓						
11/2/12		1000		X	Pre METVI-P8c 4-8	1	✓						
11/2/12		1050		X	Pre METVI-P8d 8-12	1	✓						

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	Shipped via: FedEx, Ups Or other ______ Air Bill # ______
	1/8/13 16:04			
Relinquished (Signature)	Date/Time	Received by: (Signature)	Remarks Temp 12.3	
Relinquished (Signature)	Date/Time	Received by: (Signature) Esther Merritt	Date/Time 1-8-13 16:04	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter

Split Samples:
[ ] Accepted [ ] Declined ______

ANALYTICAL SUMMARY REPORT

January 15, 2013

SDL Enterprises
PO Box 1122
E Helena, MT 59635-1125

Workorder No.: H13010121

Project Name: 1001 EHSD METV1

Energy Laboratories Inc Helena MT received the following 10 samples for SDL Enterprises on 1/8/2013 for analysis.

Sample ID	Client Sample ID	Collect Date	Receive Date	Matrix	Test
H13010121-001	Pre METV1-P9a 0-4 [0-4]	11/02/12 11:00	01/08/13	Soil	Metals by ICP/ICPMS, Total Digestion, Total Metals Soil Preparation
H13010121-002	Pre METV1-P9b 4-6 [4-6]	11/02/12 11:30	01/08/13	Soil	Same As Above
H13010121-003	Pre METV1-P9c 4-8 [4-8]	11/02/12 12:00	01/08/13	Soil	Same As Above
H13010121-004	Pre METV1-P9d 8-12 [8-12]	11/02/12 12:30	01/08/13	Soil	Same As Above
H13010121-005	Pre METV1-P10a 0-4 [0-4]	11/02/12 14:00	01/08/13	Soil	Same As Above
H13010121-006	Pre METV1-P10b 4-6 [4-6]	11/02/12 14:30	01/08/13	Soil	Same As Above
H13010121-007	Pre METV1-P10c 4-8 [4-8]	11/02/12 15:00	01/08/13	Soil	Same As Above
H13010121-008	Pre METV1-P10d 8-12 [8-12]	11/02/12 15:30	01/08/13	Soil	Same As Above
H13010121-009	Pre METV1-55 0-1 [0-1]	11/02/12 16:00	01/08/13	Soil	Same As Above
H13010121-010	Pre METV1-56 0-1 [0-1]	11/02/12 16:30	01/08/13	Soil	Same As Above

The analyses presented in this report were performed by Energy Laboratories, Inc., 3161 E. Lyndale Ave., Helena, MT 59604, unless otherwise noted. Any exceptions or problems with the analyses are noted in the Laboratory Analytical Report, the QA/QC Summary Report, or the Case Narrative.

The results as reported relate only to the item(s) submitted for testing.

If you have any questions regarding these test results, please call.

Report Approved By: Wanda Johnson
Project Manager - Helena, MT

Digitally signed by
Wanda Johnson
Date: 2013.01.16 12:40:39 -07:00

LABORATORY ANALYTICAL REPORT

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1
Workorder: H13010121

Report Date: 01/15/13
Date Received: 01/08/13

	Analysis			As-T	Cd-T	Pb-T
		Units		mg/kg	mg/kg	mg/kg
Sample ID	Client Sample ID	Up	Low	Results	Results	Results
H13010121-001	Pre METV1-P9a 0-4	0	4	65	13	653
H13010121-002	Pre METV1-P9b 4-6	4	6	59	9	405
H13010121-003	Pre METV1-P9c 4-8	4	8	52	9	384
H13010121-004	Pre METV1-P9d 8-12	8	12	23	2	124
H13010121-005	Pre METV1-P10a 0-4	0	4	73	16	797
H13010121-006	Pre METV1-P10b 4-6	4	6	67	12	701
H13010121-007	Pre METV1-P10c 4-8	4	8	37	8	406
H13010121-008	Pre METV1-P10d 8-12	8	12	28	6	322
H13010121-009	Pre METV1-55 0-1	0	1	65	18	932
H13010121-010	Pre METV1-56 0-1	0	1	80	24	1040

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/15/13
Work Order: H13010121

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: E200.7										Analytical Run: ICP2-HE_130110B
Sample ID: ICV	3	Initial Calibration Verification Standard								01/10/13 09:15
Arsenic		0.797	mg/L	0.0092	100	90	110			
Cadmium		0.400	mg/L	0.0010	100	90	110			
Lead		0.787	mg/L	0.013	98	90	110			
Sample ID: ICSA	3	Interference Check Sample A								01/10/13 09:30
Arsenic		-0.0206	mg/L	0.0092		0	0			
Cadmium		0.000570	mg/L	0.0010		0	0			
Lead		0.0261	mg/L	0.013		0	0			
Sample ID: ICSAB	3	Interference Check Sample AB								01/10/13 09:34
Arsenic		1.09	mg/L	0.0092	109	80	120			
Cadmium		0.912	mg/L	0.0010	91	80	120			
Lead		1.000	mg/L	0.013	100	80	120			
Method: E200.7										Analytical Run: ICP2-HE_130111B
Sample ID: ICV	2	Initial Calibration Verification Standard								01/11/13 10:42
Cadmium		0.396	mg/L	0.0010	99	90	110			
Lead		0.754	mg/L	0.013	94	90	110			
Sample ID: ICSA	2	Interference Check Sample A								01/11/13 10:57
Cadmium		0.00197	mg/L	0.0010		0	0			
Lead		0.0114	mg/L	0.013		0	0			
Sample ID: ICSAB	2	Interference Check Sample AB								01/11/13 11:01
Cadmium		0.902	mg/L	0.0010	90	80	120			
Lead		0.972	mg/L	0.013	97	80	120			

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

QA/QC Summary Report

Prepared by Helena, MT Branch

Client: SDL Enterprises
Project: 1001 EHSD METV1

Report Date: 01/15/13
Work Order: H13010121

Analyte	Count	Result	Units	RL	%REC	Low Limit	High Limit	RPD	RPDLimit	Qual
Method: SW6010B										Batch: 19217
Sample ID: MB-19217	3	Method Blank				Run: ICP2-HE_130110B				01/10/13 13:43
Arsenic		ND	mg/kg	0.4						
Cadmium		0.05	mg/kg	0.01						
Lead		ND	mg/kg	1						
Sample ID: LFB-19217	3	Laboratory Fortified Blank				Run: ICP2-HE_130110B				01/10/13 13:47
Arsenic		50.2	mg/kg	1.0	100	80	120			
Cadmium		24.8	mg/kg	1.0	99	80	120			
Lead		49.9	mg/kg	1.0	100	80	120			
Sample ID: LCS-19217	3	Laboratory Control Sample				Run: ICP2-HE_130110B				01/10/13 13:51
Arsenic		299	mg/kg	1.5	88	72.3	106.4			
Cadmium		129	mg/kg	1.0	95	73	105.1			
Lead		198	mg/kg	3.1	107	75.9	108.6			
Sample ID: H13010121-010AMS	3	Sample Matrix Spike				Run: ICP2-HE_130110B				01/10/13 14:46
Arsenic		127	mg/kg	1.5	95	75	125			
Cadmium		43.9	mg/kg	1.0	82	75	125			
Lead		1070	mg/kg	3.1		75	125			A
Sample ID: H13010121-010AMSD	3	Sample Matrix Spike Duplicate				Run: ICP2-HE_130110B				01/10/13 14:50
Arsenic		125	mg/kg	1.5	92	75	125	1.1	20	
Cadmium		44.9	mg/kg	1.0	86	75	125	2.2	20	
Lead		1080	mg/kg	3.1		75	125	1.1	20	A
Method: SW6010B										Batch: 19217
Sample ID: MB-19217	3	Method Blank				Run: ICP2-HE_130111B				01/11/13 11:50
Arsenic		ND	mg/kg	0.4						
Cadmium		ND	mg/kg	0.01						
Lead		ND	mg/kg	1						

Qualifiers:

RL - Analyte reporting limit.

ND - Not detected at the reporting limit.

A - The analyte level was greater than four times the spike level. In accordance with the method % recovery is not calculated.

CHAIN OF CUSTODY RECORD

SDL ENTERPRISES

PROJ. NO: 1001

PROJECT NAME: EHSD-METV1

SAMPLERS: (Signature)

DATE	STA #	TIME	COMP	GRAB	SAMPLE NUMBER		NO. OF CONTANINERS	Pb, As, Cd						REMARKS
11/2/12		1100		X	Pre METV1-P9a	0-4	1	✓						H13010121
11/2/12		1130		X	Pre METV1-P9b	4-6	1	✓						
11/2/12		1200		X	Pre METV1-P9c	4-8	1	✓						
11/2/12		1230		X	Pre METV1-P9d	8-12	1	✓						
11/2/12		1400		X	Pre METV1-P10a	0-4	1	✓						
11/2/12		1430		X	Pre METV1-P10b	4-6	1	✓						
11/2/12		1500		X	Pre METV1-P10c	4-8	1	✓						
11/2/12		1530		X	Pre METV1-P10d	8-12	1	✓						
11/2/12		1600	X		Pre METV1-55	0-4	1	✓						
11/2/12		1630	X		Pre METV1-56	0-1"	1	✓						

Relinquished (Signature)	Date/Time	Received by: (Signature)	LAB	Shipped via: FedEx, Ups Or other ______ Air Bill # ______
[signature]	1/8/13 1603			
Relinquished (Signature)	Date/Time	Received by: (Signature)	Remarks	
			TEMP 12.3 OTB/ice	
Relinquished (Signature)	Date/Time	Received by: (Signature)	Date/Time	Enclosed: [ ] Parameter List with DTLs [ ] Cover Letter
		Esther Merritt	1-8-13 16:03	

Split Samples:

[ ] Accepted [ ] Declined______

HSG Property

TETRA TECH, INC.

March 10, 2008

Mr. Jerry Bowser
Helena Sand & Gravel
PO Box 5960
Helena, Montana 59604

RE: Additional Soil Sampling Results
Lake Helena Drive Gravel Pit
East Helena, Montana

Dear Jerry:

Tetra Tech Inc. is pleased to submit this letter report of soil sampling conducted at the proposed Lake Helena Drive Gravel Pit located approximately 1.2 miles north of the intersection of West Main Street and South Montana Avenue (Figure 1) in East Helena. This report is being provided per our *Work Plan to Conduct Additional Soil Sampling and Analysis* dated January 28, 2008.

SITE HISTORY

Helena Sand and Gravel (HS&G) is an active sand and gravel operation. Expansion of the operation is proposed for an area located between Valley Drive and Lake Helena Drive, immediately south of the Helena Valley Irrigation Canal in East Helena, Montana (**Figure 1**, Attachment A). HS&G is in the process of applying for a permit with MDEQ to mine gravel deposits at the above mentioned property. The permit area includes 110 acres. The property is within the US EPA Superfund site associated with the East Helena Lead Smelter. Sixteen soil samples were collected from the site by Tetra Tech personnel and field screened using a hand held x-ray fluorescence (XRF) instrument during October 2007. Based on a January 18, 2008 meeting with the MDEQ and the LCCHD East Helena Lead Education and Abatement Program, additional soil sampling is required as part of the expansion plan.

OBJECTIVES

The objective of this work effort is to better characterize the site through collection of additional soil samples and analyze them for lead (Pb), arsenic (As), and cadmium (Cd) using an XRF instrument.

SAMPLE SITE SELECTION

During the period of February 13 through February 19, 2008 Tetra Tech collected 62 composite surface soil samples from locations within the proposed permit boundary. Surface soil is defined here as zero to six inches below grade. Sample site selection followed a large acreage sampling plan. The 110 acre area was divided into a sampling grid by HS&G personnel and subsequently approved by MDEQ and LCCHD (**Figure 2**, Attachment A).

During field efforts, HS&G personnel located each sub-sample location according to the pre-approved grid and use of HS&G survey grade GPS technology. A summary of sample coordinates is presented in Table 1 (Attachment B). The sampling scheme consisted of the following criteria:

- One composite sample was analyzed from every other acre (total of 55 area composite samples for 110 acre permit area);
- Each one acre area composite sample consisted of 13 grab sub-samples based on a matrix presented in **Figure 3**, Attachment A;
- Each of the 13 grab sub-samples were collected from the surface one inch of soil (zero to one inch below grade);
- If a one acre parcel to be sampled contained a ditch or swale, a three point composite sample along the axis of the swale was collected in addition to the 13 point area composite sample;
- A total of six, three point composite samples were collected from swales or ditches (i.e., greater than one foot depth) within the permit area;
- A swale composite sample consisted of one sample 50 feet up channel and one sample 50 feet down channel, and a third center sample point along the center line of the swale; and
- Each swale sub-sample was collected from zero to six inches below grade.

Soil sampling and analysis was completed in accordance with Tetra Tech's standard operating procedures attached. In general, grab sub-samples for a one acre area were placed into a common one gallon Ziploc bag and labeled accordingly for that one acre area to create a composite sample. Composite samples were transported to Tetra Tech's office in Helena to be dried, sieved, and analyzed using a hand-held XRF instrument (Niton Model XLt 793) for lead, arsenic, and cadmium. The XRF unit was calibrated by a Tetra Tech scientist immediately prior to sample analysis.

Table 2, Attachment B summarizes results of analysis using the XRF instrument. A review of the results indicates 25 of the 55 one acre area samples exceeded the 500 parts per million (ppm) standard established for the site. Of the 25 exceedences, four were below 500 ppm however incorporation of the confidence level indicates a possible exceedence. One acre areas exceeding the 500 ppm standard are presented on **Figure 2**, Attachment A.

A total of six swale/ditch composite samples were collected in addition to the one acre area samples according to the above mentioned criteria. Approximate location of each swale/ditch sampled is presented on **Figure 2**, Attachment A. Table 2, Attachment B summarizes results of swale/ditch sample analysis using the XRF instrument. Two of the six swale/ditch samples exceeded the 500 ppm lead standard. One of these (Ditch#4) exhibited a variety of debris such as broken glass and metal and therefore may not be representative of soil concentrations elsewhere along the ditch.

Tetra Tech appreciates the opportunity to provide Helena sand & Gravel with environmental services at the Lake Helena Drive Property. Please contact me at (406) 443-5210 if you have questions regarding this document of if I can be of further service.

Sincerely,

Jim Maus
Project Manager

Attachment A: Figures
Attachment B: Tables
Attachment C: Standard Operating Procedures

STANDARD OPERATING PROCEDURE

SOIL SAMPLE COLLECTION

This SOP describes the field equipment and sampling methods for surface and subsurface sampling of soil material. Methods explained in this SOP may be different from those identified in the project specific Sampling and Analysis Plan (SAP) and the project specific SAP should be referenced for additions or deletions to the methods noted below. All sampling equipment should be cleaned before arriving on site.

FIELD EQUIPMENT

- Sharp shooter and clean-out shovel
- Stainless steel mixing bowl and sampling trowel
- Dilute (10%) hydrochloric acid
- Hand lens (10) power
- Steel tape (10 foot)
- pH and electrical conductivity meters (if required)
- Munsel color book (if required)
- No. 10 sampling screen
- Field forms and field book
- Bucket augers

SURFACE SAMPLING

Surface soil/tailings samples are collected from the surface to a depth of one inch unless otherwise specified in the project specific work plan. Sufficient sample will be collected for the analysis that will be performed but generally this will be on the order of one gallon. Soil samples will be collected in either wide mouth glass jars or resealable polyethylene bags (ziploc or equivalent).

Samples should be described according to the procedures outlined in the Unified Soil Classification System (USCS; method ASTM D2487) or the Soil Conservation Service (SCS) classification system. Soil texture should be classified by either the USCS or U.S. Department of Agriculture (USDA) classification. Descriptions shall be recorded in field books or on standard morphological description logs as provided in the SAP.

Sub-samples should be collected from an area of approximately one square foot by digging up the top inch with the sampling trowel and placed in the mixing bowl. The sample should be screened with the 10 mesh sieve if coarse fragments are to be excluded from the sample. If a sod or duff layer is present, this layer should be pealed back to the top of the mineral soil.

The sample placed in the mixing bowl shall be well mixed and then a portion of the sample placed in the sample container. To select a sample from the mixing bowl, quarter the sample in the bowl and place an equal volume of soil from each quarter in the sample container.

All equipment used in the sampling of surface soils will be decontaminated between each composite sample using the procedures in SOP-11. All necessary paperwork will be filled out in accordance with SOP-12.

SUBSURFACE SAMPLING

Subsurface sampling will be completed using a bucket auger, split spoon sampler, or hand dug or backhoe excavated pits. Sampling procedures for each type of equipment is described below. Sample collection, homogenation, and transfer to sampling containers should follow the same procedures as outlined for collection of surface samples.

Bucket Auger

1. Arrive on-site equipped with stainless steel auger rod and several sizes of stainless steel bucket augers (e.g. 2-inch, 4-inch, 6-inch, etc.).

2. Bucket auger holes can be drilled as one size or in a telescoping manner if contamination between sample intervals is a concern. If a single sized, advance the bucket auger to the desired sampling interval depth and empty the contents of the auger in a stainless steel mixing bowl. For the telescoping method, advance the largest auger to an approximate depth of three feet, collecting specified depth increment samples as the auger is advanced. Install temporary decontaminated PVC casing with a diameter slightly smaller than the borehole to keep the hole open and reduce possible cross-contamination between depth intervals. Using the next size smaller bucket auger, repeat the process.
3. Select sample intervals for packaging for laboratory analysis in accordance with procedures described in the SAP.

4. Fill out appropriate paper work and bottle labels as necessary prior to leaving site.

5. Decontaminate all equipment between sample locations.

Split Spoon Sampler

1. Arrive on-site equipped with at least two standard 1.4 inch inside diameter split spoon samplers. If geotechnical information is desired, a 140 pound drive hammer is required.

2. Install sampler into borehole and advance to the desired depth with the 140 pound drop hammer or equivalent means. Record number of blow counts to complete sampling over each 18-inch interval, as necessary. Retrieve sampler and place on work table. Using the other sampler, repeat this sequence.

3. Record lithology and percent recovery from cores retrieved from split spoon sampler.

4. Based upon the project work plan or sampling and analysis plan, composite like core intervals by mixing in stainless steel bowl in a similar manner as described for surface sampling. When sampling for organics, the sample should not be mixed.

5. Decontaminate sampling equipment between each interval sampled if required by the SAP. Decontaminate sampling equipment between sampling sites.

Backhoe or Hand Dug Excavations

1. Locate the site to be sampled and insure that equipment can safely access the site. Minimize off road travel to prevent off site damage to surrounding vegetation.

2. Orient excavation to maximize use of the angle of the sun to illuminate the pit for photographs. Place excavated material a sufficient distance from the excavation.

3. Excavate to the prescribed depth. If the pit exceeds five feet in depth, OSHA construction standards for

shoring or sloping must be observed to prevent accidental burials. Sampling personnel should enter the pit with care during and after excavation.

4. Soil profile descriptions shall be made from a hand cleaned surface along the pit wall. Complete profile descriptions and take photographs before pit is sampled.

5. Soil samples shall be collected from depth intervals specified in the SAP. When a depth interval is sampled, an equal volume of soil should be collected from the entire interval exposed on the pit wall. Soil samples will be collected with the stainless steel trowel and mixing bowl according to methods described for surface soil sampling. When sampling for organics, the sample should not be mixed.

6. After sampling is completed, the pit should be backfilled with excavated material in the reverse order that it was excavated so that topsoil material is returned to the top of the pit. When backfilling is complete the area should be cleaned-up to its original condition.

7. Decontaminate sampling equipment between composite sampling sites. Excavation equipment should be cleaned between sites with water (where possible) or with a shovel to remove accumulated dirt and mud.

STANDARD OPERATING PROCEDURE

X-RAY FLUORESCENCE SPECTROMETER (XRF) USE AND CALIBRATION

The chemical characterization of soil samples in the field will be determined by the field portable X-ray fluorescence (XRF) Spectrometer XLt 700 Series instrument manufactured by Niton. The instrument uses low level self-contained and shielded radioactive sources that produce spectral peaks whose position (energy level) is specific to an individual element and whose peak height or area which is indicative of the concentration of that element within the area exposed to the source. The Niton XLt Series units use an x-ray tube as an excitation source. This source allows semiquantitative determination of up to 22 elements including: copper, zinc, arsenic, iron, manganese, lead, cadmium, chromium, barium, cobalt, nickel, selenium, and molybdenum.

The detection limit for each parameter is a function of source strength, geometry/particle size, counting time, and the concentration of other elements. Since the source strength and instrument geometry are constants, the detection limit is dependent on geometry/particle size, counting time, and concentration. It has been demonstrated that 80 mesh particle size dominantly composed of a siliceous or calcareous skeletal matrix will give analytical results within 20 percent. The larger the particle size, the larger the error. A rock made up of fine-grained minerals, however, will essentially have the same precision and accuracy as a finely ground sample.

Soil samples will be screened and all particles greater than 2 mm (No. 10 sieve) will be removed.

The counting time also affects the detection limit. In general, the longer the counting time, the lower the detection limit, and certainly the higher the precision and accuracy. The instrument has controllable time units of 10, 30, 100, 300, and manual control seconds. The 30 second counting time will likely be the standard for this test. The time may change for either or both sources depending on the actual sample matrix encountered in the field.

The primary operator will receive one day's training on the proper use of the instrument particularly for health and safety purposes. The manufacturer's statement on radiation safety is also attached. Each operator will have a gamma film badge service (monthly) and will have the dates and times used logged in the record book specifically kept for this purpose.

Calibration of the unit will be provided by the following method.

The XRF will be calibrated using the internal standards as recommended by the manufacturer. This internal calibration will be performed, each day of use, in the morning, at noon and at the end of the day. Time, temperature and calibration data will be noted during each calibration in the field logbook.

Data for metals concentrations will be recorded in the field logbook or on standard forms.

To obtain the best quantitative XRF results, a uniform volume of soil material of generally the same particle size will be used. The sample should be prepared in the following manner: (1) Disaggregate and homogenize field moist sample, foreign objects such as rocks, twigs, roots, etc.; (2) Dry sample preferably overnight in an over set at approximately 105°C; (3) Cool sample to room temperature; (4) Sieve sample through a 2 mm nonmetallic sieve; (5) homogenize sieved sample; and, (6) Place sample in a 2-inch petri dish or a one quart resealable polyethylene bag (Ziploc or equivalent).

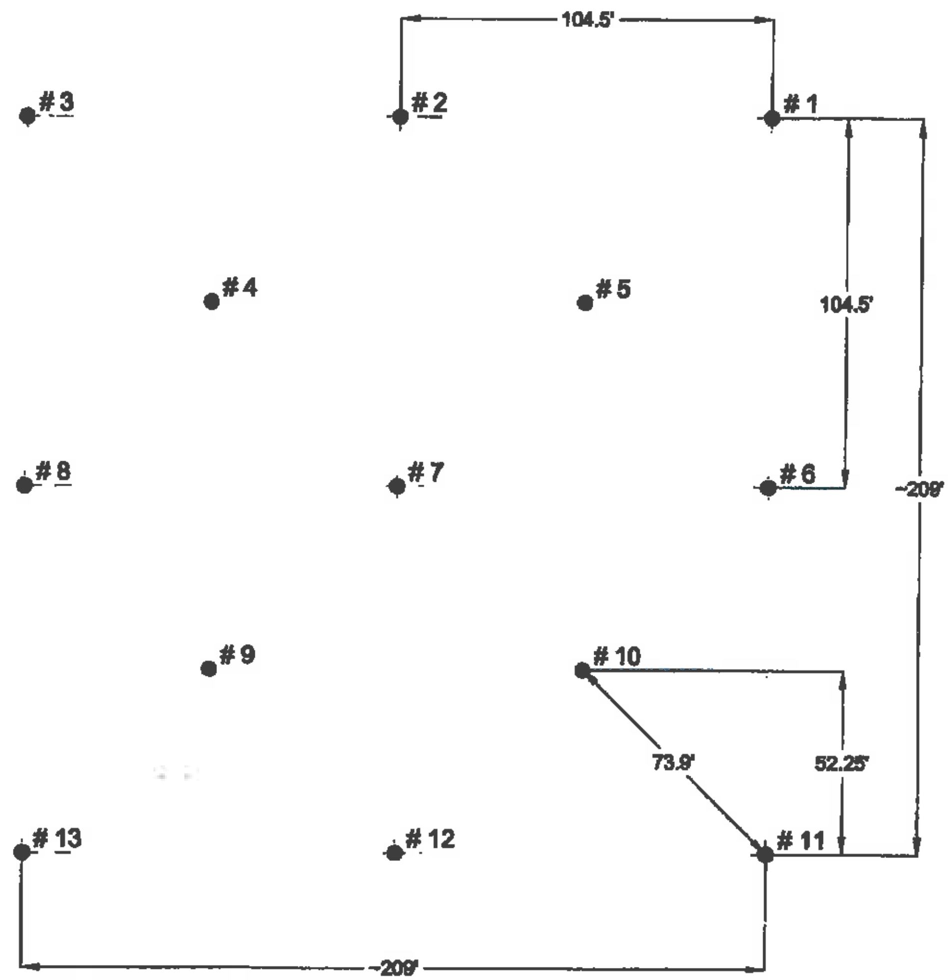
The soil material will be well packed in the petri dish and the top surface should be uniformly smoothed to the level of the petri dish edges. The head of the XRF should then be placed over the petri dish. If soil is sticking to the XRF, place a piece of Saran Wrap over the petri dish.

If a resealable polyethylene bag is used the bag will be filled approximately half way then sealed. The sealed sample will be manipulated so that a sample thickness of approximately one inch is present. The head of the XRF should then be placed over the one inch thick sample.

If any dust sticks to the head of the XRF, clean it with a fine-bristle paint brush.

ATTACHMENT A
FIGURES

One Acre Area Sample Grid



#1 = Subsample (for composite) Number

#7 = "Survey" Point Shown on Site Sample Location Map

January 2008

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8581651.100

Area Soil Sampling Grid
Proposed - Lake Helena Drive Pit
Helena, Montana
FIGURE 3

ATTACHMENT B
TABLES

TABLE 1

SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
1	1-1 / 10-13	8084.746	22097.310
1	1-2	8083.605	21998.545
1	1-3	8082.468	21900.123
1	1-4	8033.823	21949.506
1	1-5	8034.960	22047.927
1	1-6	7986.314	22097.310
1	**1-7**	**7985.178**	**21998.890**
1	1-8	7984.042	21900.605
1	1-9	7935.395	21949.851
1	1-10	7936.532	22048.273
1	1-11	7887.887	22097.656
1	1-12	7886.750	21999.234
1	1-13	7885.615	21900.972
2	2-1 / 9-13	8089.289	22490.652
2	2-2	8088.153	22392.232
2	2-3 / 10-11	8087.016	22293.810
2	2-4	8038.371	22343.193
2	2-5	8039.507	22441.615
2	2-6	7990.858	22490.652
2	**2-7**	**7989.725**	**22392.576**
2	2-8	7988.588	22294.154
2	2-9	7939.943	22343.537
2	2-10	7941.080	22441.959
2	2-11	7892.431	22490.998
2	2-12	7891.298	22392.922
2	2-13	7890.161	22294.500
3	3-1 / 8-13	8093.837	22884.340
3	3-2	8092.701	22785.918
3	3-3 / 9-11	8091.564	22687.496
3	3-4	8042.918	22736.879
3	3-5	8044.055	22835.301
3	3-6	7993.136	22687.842
3	**3-7**	**7994.273**	**22786.263**
3	3-8	7995.406	22884.340
3	3-9	7944.491	22737.224
3	3-10	7945.627	22835.646
3	3-11	7896.982	22885.029
3	3-12	7895.841	22786.263
3	3-13	7894.708	22688.185
4	4-1 / 7-13	8098.385	23278.025
4	4-2	8097.248	23179.605
4	4-3 / 8-11	8096.111	23081.183
4	4-4	8047.466	23130.566
4	4-5	8048.603	23228.988
4	4-6	7999.957	23278.371

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
4	**4-7**	**7998.821**	**23179.949**
4	4-8	7997.683	23081.527
4	4-9	7949.038	23130.910
4	4-10	7950.175	23229.332
4	4-11	7901.530	23278.715
4	4-12	7900.393	23180.295
4	4-13	7899.256	23081.873
5	5-1 / 6-13	8102.933	23671.713
5	5-2	8101.796	23573.291
5	5-3 / 7-11	8100.659	23474.869
5	5-4	8052.017	23524.597
5	5-5	8053.154	23623.019
5	5-6	8004.505	23672.056
5	**5-7**	**8003.368**	**23573.636**
5	5-8	8002.227	23474.869
5	5-9	7953.586	23524.597
5	5-10	7954.723	23623.019
5	5-11	7906.078	23672.402
5	5-12	7904.936	23573.636
5	5-13	7903.804	23475.558
6	6-1	8302.061	23867.867
6	6-2	8299.788	23769.449
6	6-3 / 15-11	8299.788	23671.023
6	6-4	8252.279	23720.402
6	6-5	8252.279	23818.828
6	6-6	8203.634	23868.211
6	**6-7**	**8202.497**	**23769.789**
6	6-8	8201.360	23671.367
6	6-9	8152.715	23720.752
6	6-10	8153.852	23819.172
6	6-11	8105.206	23868.556
6	6-12	8104.070	23770.135
6	6-13 / 5-1	8102.933	23671.713
7	7-1 / 15-13	8297.514	23474.179
7	7-2	8297.514	23375.754
7	7-3 / 14-11	8295.240	23277.336
7	7-4	8246.595	23326.720
7	7-5	8247.732	23425.140
7	7-6	8199.086	23474.525
7	**7-7**	**8199.086**	**23376.099**
7	7-8	8197.950	23277.677
7	7-9	8148.167	23327.064
7	7-10	8149.304	23425.486
7	7-11 / 5-3	8100.659	23474.869
7	7-12	8098.385	23376.451

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
7	7-13 / 4-1	8098.385	23278.025
8	8-1 / 14-13	8292.970	23080.838
8	8-2	8291.833	22982.416
8	8-3 / 13-11	8290.692	22883.650
8	8-4	8242.047	22933.033
8	8-5	8243.184	23031.455
8	8-6	8194.539	23080.838
8	**8-7**	**8193.402**	**22982.416**
8	8-8	8192.265	22883.994
8	8-9	8143.620	22933.379
8	8-10	8144.757	23031.799
8	8-11 / 4-3	8096.111	23081.183
8	8-12	8094.974	22982.761
8	8-13 / 3-1	8093.837	22884.340
9	9-1 / 13-13	8288.419	22686.806
9	9-2	8287.282	22588.385
9	9-3 / 12-11	8286.145	22489.963
9	9-4	8237.499	22539.347
9	9-5	8238.637	22637.767
9	9-6	8188.854	22687.156
9	**9-7**	**8188.854**	**22588.730**
9	9-8	8187.717	22490.308
9	9-9	8139.072	22539.691
9	9-10	8140.209	22638.113
9	9-11 / 3-3	8091.564	22687.496
9	9-12	8090.427	22589.074
9	9-13 / 2-1	8089.289	22490.652
10	10-1 / 12-13	8283.871	22293.121
10	10-2	8282.734	22194.699
10	10-3 / 11-11	8281.597	22096.277
10	10-4	8232.952	22145.660
10	10-5	8234.089	22244.082
10	10-6	8184.307	22293.468
10	**10-7**	**8183.170**	**22195.047**
10	10-8	8183.170	22096.621
10	10-9	8134.524	22146.006
10	10-10	8135.661	22244.426
10	10-11 / 2-3	8087.016	22293.810
10	10-12	*Missed-Not Surveyed*	*Missed-Not Surveyed*
10	10-13 / 1-1	8084.746	22097.310
11	11-1 / 20-13	8477.315	22095.592
11	11-2	8476.179	21997.170
11	11-3	8476.179	21898.744
11	11-4	8427.533	21948.127
11	11-5	8428.670	22046.549

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
11	11-6	8380.025	22095.931
11	**11-7**	**8377.751**	**21997.515**
11	11-8	8377.751	21899.090
11	11-9	8329.106	21948.472
11	11-10	8330.243	22046.894
11	11-11 / 10-3	8281.597	22096.277
11	11-12	8280.460	21997.855
11	11-13	8279.323	21899.433
12	12-1 / 19-13	8481.863	22489.277
12	12-2	8480.726	22390.855
12	12-3 / 20-11	8480.726	22292.431
12	12-4	8432.081	22341.814
12	12-5	8433.218	22440.236
12	12-6	8384.573	22489.619
12	**12-7**	**8384.573**	**22391.193**
12	12-8	8383.435	22292.771
12	12-9	8333.653	22342.158
12	12-10	8334.790	22440.580
12	12-11 / 9-3	8286.145	22489.963
12	12-12	8285.008	22391.541
12	12-13 / 10-1	8283.871	22293.121
13	13-1 / 18-13	8487.548	22882.961
13	13-2	8486.411	22784.539
13	13-3 / 19-11	8485.274	22686.117
13	13-4	8436.628	22735.500
13	13-5	8437.766	22833.922
13	13-6	8389.120	22883.304
13	**13-7**	**8387.983**	**22784.883**
13	13-8	8386.846	22686.463
13	13-9	8338.201	22735.845
13	13-10	8339.334	22833.922
13	13-11 / 8-3	8290.692	22883.650
13	13-12	8289.556	22785.228
13	13-13 / 9-1	8288.419	22686.806
14	14-1 / 17-13	8492.095	23276.646
14	14-2	8490.958	23178.224
14	14-3 / 18-11	8489.822	23079.804
14	14-4	8441.176	23129.187
14	14-5	8442.313	23227.609
14	14-6	8393.668	23276.992
14	**14-7**	**8392.531**	**23178.570**
14	14-8	8392.531	23080.144
14	14-9	8342.748	23129.531
14	14-10	8343.886	23227.953
14	14-11 / 7-3	8295.240	23277.336

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
14	14-12	8294.103	23178.914
14	14-13 / 8-1	8292.970	23080.838
15	15-1 / 16-13	8496.643	23670.334
15	15-2	8495.506	23571.912
15	15-3 / 17-11	8494.369	23473.490
15	15-4	8445.724	23522.873
15	15-5	8446.861	23621.295
15	15-6	8398.215	23670.677
15	**15-7**	**8397.079**	**23572.256**
15	15-8	8397.079	23473.832
15	15-9	8347.296	23523.218
15	15-10	8348.433	23621.640
15	15-11 / 6-3	8299.788	23671.023
15	15-12	8298.651	23572.601
15	15-13 / 7-1	8297.514	23474.179
16	16-1	8695.772	23866.486
16	16-2	8694.635	23768.066
16	16-3 / 25-11	8693.498	23669.644
16	16-4	8644.853	23719.027
16	16-5	8645.990	23817.449
16	16-6	8597.344	23866.832
16	**16-7**	**8596.207**	**23768.410**
16	16-8	8595.071	23669.988
16	16-9	8546.425	23719.371
16	16-10	8547.562	23817.793
16	16-11	8498.917	23867.176
16	16-12	8497.780	23768.756
16	16-13 / 15-1	8496.643	23670.334
17	17-1 / 25-13	8691.225	23472.801
17	17-2	8690.087	23374.379
17	17-3 / 24-11	8688.951	23275.957
17	17-4	8641.442	23325.336
17	17-5	8641.442	23423.761
17	17-6	8591.660	23473.150
17	**17-7**	**8590.523**	**23374.728**
17	17-8	8590.523	23276.302
17	17-9	8541.877	23325.685
17	17-10	8541.877	23424.111
17	17-11 / 15-3	8494.369	23473.490
17	17-12	8493.232	23375.068
17	17-13 / 14-1	8492.095	23276.646
18	18-1 / 24-13	8686.677	23079.113
18	18-2	8685.544	22981.037
18	18-3 / 23-11	8684.407	22882.615
18	18-4	8635.758	22931.654

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
18	18-5	8636.894	23030.076
18	18-6	8588.249	23079.459
18	**18-7**	**8587.112**	**22981.037**
18	18-8	8585.975	22882.615
18	18-9	8537.330	22931.998
18	18-10	8538.467	23030.420
18	18-11 / 14-3	8489.822	23079.804
18	18-12	8488.684	22981.383
18	18-13 / 13-1	8487.548	22882.961
19	19-1 / 23-13	8682.129	22685.427
19	19-2	8682.129	22587.002
19	19-3 / 22-11	8680.992	22488.580
19	19-4	8631.210	22537.967
19	19-5	8632.347	22636.388
19	19-6	8583.702	22685.773
19	**19-7**	**8582.564**	**22587.351**
19	19-8	8581.428	22488.929
19	19-9	8532.782	22538.312
19	19-10	8533.919	22636.734
19	19-11 / 13-3	8485.274	22686.117
19	19-12	8484.137	22587.695
19	19-13 / 12-1	8481.863	22489.277
20	20-1 / 22-13	8677.581	22291.742
20	20-2	8676.444	22193.320
20	20-3 / 21-11	8675.308	22094.898
20	20-4	8626.662	22144.281
20	20-5	8627.803	22243.047
20	20-6	8579.154	22292.086
20	**20-7**	**8578.017**	**22193.664**
20	20-8	8576.880	22095.242
20	20-9	8528.235	22144.625
20	20-10	8529.371	22243.047
20	20-11 / 12-3	8480.726	22292.431
20	20-12	8479.589	22194.010
20	20-13 / 11-1	8477.315	22095.592
21	21-1 / 30-13	8872.162	22094.209
21	21-2	8871.026	21995.787
21	21-3 / 31-11	8869.889	21897.365
21	21-4	8821.244	21946.748
21	21-5	8822.380	22045.170
21	21-6	8773.735	22094.552
21	**21-7**	**8772.598**	**21996.131**
21	21-8	8771.461	21897.709
21	21-9	8722.816	21947.093
21	21-10	8723.953	22045.515

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
21	21-11 / 20-3	8675.308	22094.898
21	21-12	8674.171	21996.476
21	21-13	8674.171	21898.051
22	22-1 / 29-13	8876.710	22487.894
22	22-2	8875.574	22389.472
22	22-3 / 30-11	8874.436	22291.051
22	22-4	8825.791	22340.435
22	22-5	8826.928	22438.857
22	22-6	8778.283	22488.240
22	**22-7**	**8777.146**	**22389.818**
22	22-8	8776.009	22291.396
22	22-9	8727.364	22340.779
22	22-10	8728.500	22439.201
22	22-11 / 19-3	8680.992	22488.580
22	22-12	8678.718	22390.162
22	22-13 / 20-1	8677.581	22291.742
23	23-1 / 28-13	8881.258	22881.582
23	23-2	8880.121	22783.160
23	23-3 / 29-11	8878.984	22684.738
23	23-4	8830.339	22734.121
23	23-5	8831.476	22832.543
23	23-6	8782.830	22881.926
23	**23-7**	**8781.694**	**22783.504**
23	23-8	8781.694	22685.078
23	23-9	8731.911	22734.467
23	23-10	8733.048	22832.888
23	23-11 / 18-3	8684.407	22882.615
23	23-12	8683.266	22783.849
23	23-13 / 19-1	8682.129	22685.427
24	24-1 / 27-13	8884.669	23275.271
24	24-2	8883.532	23176.849
24	24-3 / 28-11	8883.532	23078.424
24	24-4	8834.887	23127.808
24	24-5	8836.023	23226.228
24	24-6	8787.378	23275.613
24	**24-7**	**8786.241**	**23177.191**
24	24-8	8785.104	23078.769
24	24-9	8736.459	23128.152
24	24-10	8737.596	23226.574
24	24-11 / 17-3	8688.951	23275.957
24	24-12	8687.813	23177.535
24	24-13 / 18-1	8686.677	23079.113
25	25-1 / 26-13	8889.216	23668.959
25	25-2	8889.216	23570.533
25	25-3 / 27-11	8888.079	23472.111

[1] - Coordinates based on local control points established by Helena Sand and Gravel
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TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
25	25-4	8839.434	23521.494
25	25-5	8840.571	23619.916
25	25-6	8791.926	23669.299
25	**25-7**	**8789.652**	**23570.881**
25	25-8	8789.652	23472.455
25	25-9	8741.007	23521.840
25	25-10	8742.143	23620.260
25	25-11 / 16-3	8693.498	23669.644
25	25-12	8692.361	23571.222
25	25-13 / 17-1	8691.225	23472.801
26	26-1	9088.346	23865.111
26	26-2	9087.208	23766.689
26	26-3 / 39-11	9087.208	23668.265
26	26-4	9038.563	23717.648
26	26-5	9039.700	23816.070
26	26-6	8991.055	23865.453
26	**26-7**	**8989.918**	**23767.031**
26	26-8	8988.781	23668.609
26	26-9	8940.136	23717.992
26	26-10	8941.272	23816.414
26	26-11	8892.627	23865.797
26	26-12	8891.490	23767.375
26	26-13 / 25-1	8889.216	23668.959
27	27-1 / 39-13	9084.934	23471.422
27	27-2	9084.934	23372.996
27	27-3 / 38-11	9082.661	23274.578
27	27-4	9034.016	23323.961
27	27-5	9035.152	23422.383
27	27-6	8986.507	23471.765
27	**27-7**	**8985.370**	**23373.343**
27	27-8	8985.370	23274.920
27	27-9	8935.588	23324.306
27	27-10	8936.725	23422.728
27	27-11 / 25-3	8888.079	23472.111
27	27-12	8886.943	23373.689
27	27-13 / 24-1	8884.669	23275.271
28	28-1 / 38-13	9080.387	23077.734
28	28-2	9079.250	22979.312
28	28-3 / 37-11	9078.113	22880.892
28	28-4	9030.605	22930.271
28	28-5	9030.605	23028.697
28	28-6	8981.959	23078.080
28	**28-7**	**8980.823**	**22979.658**
28	28-8	8979.685	22881.236
28	28-9	8931.040	22930.619

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
28	28-10	8932.177	23029.041
28	28-11 / 24-3	8883.532	23078.424
28	28-12	8882.395	22980.004
28	28-13 / 23-1	8881.258	22881.582
29	29-1 / 37-13	9075.839	22684.049
29	29-2	9074.703	22585.627
29	29-3 / 36-11	9073.565	22487.205
29	29-4	9024.920	22536.588
29	29-5	9026.057	22635.010
29	29-6	8977.412	22684.392
29	**29-7**	**8976.275**	**22585.972**
29	29-8	8975.138	22487.551
29	29-9	8926.493	22536.933
29	29-10	8927.629	22635.355
29	29-11 / 23-3	8878.984	22684.738
29	29-12	8877.847	22586.316
29	29-13 / 22-1	8876.710	22487.894
30	30-1 / 36-13	9071.292	22290.361
30	30-2	9069.018	22191.945
30	30-3 / 35-11	9069.018	22093.519
30	30-4	9020.372	22142.902
30	30-5	9021.510	22241.324
30	30-6	8972.864	22290.707
30	**30-7**	**8972.864**	**22192.281**
30	30-8	8971.727	22093.859
30	30-9	8921.945	22143.246
30	30-10	8923.082	22241.668
30	30-11 / 22-3	8874.436	22291.051
30	30-12	8873.300	22192.631
30	30-13 / 21-1	8872.162	22094.209
31	31-1 / 35-13	9066.744	21896.676
31	31-2	9065.607	21798.254
31	31-3 / 34-11	9064.470	21699.832
31	31-4	9015.825	21749.215
31	31-5	9016.962	21847.636
31	31-6	8968.316	21897.019
31	**31-7**	**8967.180**	**21798.599**
31	31-8	8967.180	21700.174
31	31-9	8917.397	21749.560
31	31-10	8917.397	21847.986
31	31-11 / 21-3	8869.889	21897.365
31	31-12	8868.752	21798.943
31	31-13	8867.615	21700.521
32	32-1 / 46-13	9254.504	21108.613
32	32-2 / 46-12	9254.504	21010.187

[1] - Coordinates based on local control points established by Helena Sand and Gravel
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TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
32	32-3 / 46-11	9252.230	20911.769
32	32-4	9251.085	20812.658
32	32-5	9249.956	20714.926
32	32-6	9203.512	20763.275
32	**32-7**	**9204.648**	**20861.697**
32	32-8	9205.793	20960.808
32	32-9	9206.931	21059.230
32	32-10	9159.361	21010.187
32	32-11	9160.497	20912.092
32	32-12	9158.227	20715.248
32	32-13	*Missed-Not Surveyed*	*Missed-Not Surveyed*
33	33-1	9195.179	21451.236
33	33-2	9203.172	21369.676
33	33-3	9166.406	21414.455
33	33-4	9126.443	21456.035
33	33-5	9118.451	21374.474
33	33-6	9096.072	21427.248
33	**33-7**	**9061.507**	**21455.836**
33	33-8	9061.507	21381.617
33	33-9	9028.937	21468.508
33	33-10	9027.128	21569.881
33	33-11	8994.558	21526.435
33	33-12	*Odd Shaped Cell - 11 Sample Points Only*	
33	33-13	*Odd Shaped Cell - 11 Sample Points Only*	
34	34-1 / 44-13	9261.326	21699.142
34	34-2	9260.188	21600.720
34	34-3 / 45-11	9259.052	21502.299
34	34-4	9210.406	21551.683
34	34-5	9211.543	21650.103
34	34-6	9162.898	21699.488
34	**34-7**	**9161.761**	**21601.066**
34	34-8	9161.761	21502.640
34	34-9	9111.978	21552.027
34	34-10	9113.116	21650.449
34	34-11 / 31-3	9064.470	21699.832
34	34-12	9063.333	21601.410
34	34-13	9062.196	21502.988
35	35-1 / 43-13	9264.736	22092.834
35	35-2	9263.599	21994.412
35	35-3 / 44-11	9263.599	21895.986
35	35-4	9216.091	21945.365
35	35-5	9216.091	22043.791
35	35-6	9167.446	22093.174
35	**35-7**	**9166.308**	**21994.752**
35	35-8	9165.172	21896.330

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
35	35-9	9116.526	21945.715
35	35-10	9117.663	22044.135
35	35-11 / 30-3	9069.018	22093.519
35	35-12	9067.881	21995.097
35	35-13 / 31-1	9066.744	21896.676
36	36-1 / 42-13	9270.421	22486.515
36	36-2	9270.421	22388.090
36	36-3 / 43-11	9269.284	22289.668
36	36-4	9219.501	22339.056
36	36-5	9219.501	22437.480
36	36-6	9171.993	22486.861
36	**36-7**	**9171.993**	**22388.435**
36	36-8	9169.719	22290.017
36	36-9	9121.074	22339.400
36	36-10	9122.211	22437.822
36	36-11 / 29-3	9073.565	22487.205
36	36-12	9072.429	22388.783
36	36-13 / 30-1	9071.292	22290.361
37	37-1 / 41-13	9274.968	22880.203
37	37-2	9273.831	22781.781
37	37-3 / 42-11	9272.695	22683.359
37	37-4	9224.049	22732.742
37	37-5	9225.186	22831.164
37	37-6	9176.541	22880.547
37	**37-7**	**9175.404**	**22782.125**
37	37-8	9175.404	22683.699
37	37-9	9125.621	22733.088
37	37-10	9126.759	22831.508
37	37-11 / 28-3	9078.113	22880.892
37	37-12	9076.976	22782.470
37	37-13 / 29-1	9075.839	22684.049
38	38-1	9279.516	23273.888
38	38-2	9278.379	23175.467
38	38-3 / 41-11	9277.242	23077.045
38	38-4	9228.597	23126.427
38	38-5	9229.734	23224.849
38	38-6	9181.088	23274.234
38	**38-7**	**9179.952**	**23175.812**
38	38-8	9179.952	23077.386
38	38-9	9130.169	23126.773
38	38-10	9131.306	23225.195
38	38-11 / 27-3	9082.661	23274.578
38	38-12	9081.524	23176.156
38	38-13 / 28-1	9080.387	23077.734
39	39-1 / 40-11	9284.064	23667.576

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1

SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
39	39-2 / 40-12	9282.927	23569.154
39	39-3 / 40-13	9281.790	23470.732
39	39-4	9233.144	23520.115
39	39-5	9234.281	23618.537
39	39-6	9185.636	23667.920
39	**39-7**	**9184.499**	**23569.498**
39	39-8	9183.362	23471.076
39	39-9	9134.717	23520.459
39	39-10	9134.717	23618.885
39	39-11 / 26-3	9087.208	23668.265
39	39-12	9086.072	23569.843
39	39-13 / 27-1	9084.934	23471.422
40	40-1	9344.654	23864.215
40	40-2	9369.260	23766.689
40	40-3	9394.267	23667.576
40	40-4	9419.099	23569.154
40	40-5	9443.931	23470.732
40	40-6	9344.654	23521.183
40	**40-7**	**9344.654**	**23619.609**
40	40-8	9344.654	23718.035
40	40-9	9286.337	23864.418
40	40-10	9285.208	23766.689
40	40-11 / 39-1	9284.064	23667.576
40	40-12 / 39-2	9282.927	23569.154
40	40-13 / 39-3	9281.790	23470.732
41	41-1	9474.097	23076.355
41	41-2	9472.960	22977.933
41	41-3	9471.824	22879.511
41	41-4	9423.178	22928.896
41	41-5	9424.315	23027.318
41	41-6	9375.669	23076.701
41	**41-7**	**9374.537**	**22978.623**
41	41-8	9373.396	22879.857
41	41-9	9324.750	22929.240
41	41-10	9325.884	23027.318
41	41-11 / 38-3	9277.242	23077.045
41	41-12	9276.105	22978.623
41	41-13 / 37-1	9274.968	22880.203
42	42-1	9469.554	22683.013
42	42-2	9468.412	22584.248
42	42-3 / 51-10	9467.276	22485.826
42	42-4	9418.630	22535.209
42	42-5	9418.630	22633.635
42	42-6	9371.122	22683.013
42	**42-7**	**9369.985**	**22584.592**

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
42	42-8	9369.985	22486.166
42	42-9	9320.203	22535.554
42	42-10	9320.203	22633.980
42	42-11 / 37-3	9272.695	22683.359
42	42-12	9286.337	23864.418
42	42-13 / 36-1	9270.421	22486.515
43	43-1 / 51-8	9465.002	22288.982
43	43-2	9463.865	22190.560
43	43-3 / 50-11	9462.728	22092.140
43	43-4	9414.082	22141.523
43	43-5	9415.220	22239.945
43	43-6	9366.575	22289.328
43	**43-7**	**9365.437**	**22190.906**
43	43-8	9365.437	22092.480
43	43-9	9315.655	22141.867
43	43-10	9315.655	22240.293
43	43-11 / 36-3	9269.284	22289.668
43	43-12	*Missed-Not Surveyed*	*Missed-Not Surveyed*
43	43-13 / 35-1	9264.736	22092.834
44	44-1 / 50-13	9460.454	21895.297
44	44-2	9459.318	21796.875
44	44-3 / 49-11	9458.181	21698.453
44	44-4	9409.536	21747.836
44	44-5	9410.672	21846.258
44	44-6	9362.027	21895.640
44	**44-7**	**9362.027**	**21797.215**
44	44-8	9360.890	21698.795
44	44-9	9312.245	21846.603
44	44-10	9311.108	21748.181
44	44-11 / 35-3	9263.599	21895.986
44	44-12	9262.462	21797.564
44	44-13 / 34-1	9261.326	21699.142
45	45-1 / 49-13	9455.907	21501.609
45	45-2	9454.770	21403.187
45	45-3 / 48-11	9453.633	21304.767
45	45-4	9404.988	21354.150
45	45-5	9404.988	21452.576
45	45-6	9357.479	21501.955
45	**45-7**	**9357.479**	**21403.529**
45	45-8	9355.205	21305.111
45	45-9	9306.560	21354.494
45	45-10	9307.697	21452.916
45	45-11 / 34-3	9259.052	21502.299
45	45-12	9257.914	21403.877
45	45-13	9256.778	21305.457

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
46	46-1 / 48-13	9451.359	21107.924
46	46-2	9451.359	21009.498
46	46-3 / 47-11	9450.222	20911.076
46	46-4	9400.440	20960.463
46	46-5	9400.440	21058.888
46	46-6	9352.932	21108.267
46	**46-7**	**9351.795**	**21009.845**
46	46-8	9350.658	20911.426
46	46-9	9302.013	20960.808
46	46-10	9303.149	21059.230
46	46-11 / 32-3	9252.230	20911.769
46	46-12 / 32-2	9254.504	21010.187
46	46-13 / 32-1	9254.504	21108.613
47	47-1 / 54-13	9645.941	20910.390
47	47-2	9644.803	20811.968
47	47-3	9643.666	20713.547
47	47-4	9595.021	20762.929
47	47-5	9595.021	20861.355
47	47-6	9547.513	20910.736
47	**47-7**	**9547.513**	**20812.310**
47	47-8	9546.376	20713.888
47	47-9	9496.594	20763.275
47	47-10	9497.731	20861.697
47	47-11 / 46-3	9450.222	20911.076
47	47-12	9447.949	20812.658
47	47-13	9447.949	20714.232
48	48-1 / 53-13	9650.488	21304.078
48	48-2	9649.351	21205.656
48	48-3 / 54-11	9648.214	21107.234
48	48-4	9599.569	21156.617
48	48-5	9599.569	21255.043
48	48-6	9552.061	21304.422
48	**48-7**	**9550.923**	**21206.000**
48	48-8	9549.787	21107.578
48	48-9	9501.141	21156.961
48	48-10	9501.141	21255.386
48	48-11 / 45-3	9453.633	21304.767
48	48-12	9452.496	21206.345
48	48-13 / 46-1	9451.359	21107.924
49	49-1 / 52-13	9655.036	21697.763
49	49-2	9653.899	21599.342
49	49-3 / 53-11	9652.762	21500.920
49	49-4	9604.117	21550.302
49	49-5	9605.253	21648.724
49	49-6	9556.608	21698.109

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
49	**49-7**	**9555.471**	**21599.687**
49	49-8	9554.334	21501.265
49	49-9	9505.689	21550.648
49	49-10	9506.826	21649.070
49	49-11 / 44-3	9458.181	21698.453
49	49-12	9457.043	21600.031
49	49-13 / 45-1	9455.907	21501.609
50	50-1	9659.583	22091.449
50	50-2	9658.447	21993.029
50	50-3 / 52-11	9657.310	21894.607
50	50-4	9608.664	21943.990
50	50-5	9609.801	22042.412
50	50-6	9561.156	22091.795
50	**50-7**	**9560.019**	**21993.373**
50	50-8	9558.882	21894.951
50	50-9	9510.237	21944.334
50	50-10	9511.373	22042.756
50	50-11 / 43-3	9462.728	22092.140
50	50-12	9461.591	21993.718
50	50-13 / 44-1	9460.454	21895.297
51	51-1	9614.349	22436.097
51	51-2	9613.212	22337.676
51	51-3	9563.430	22288.638
51	51-4	9563.430	22387.064
51	51-5	9564.567	22485.486
51	51-6	9515.921	22436.443
51	**51-7**	**9514.785**	**22338.021**
51	51-8 / 43-1	9465.002	22288.982
51	51-9	9466.139	22387.404
51	51-10 / 42-3	9467.276	22485.826
51	51-11	*Odd Shaped Cell - 11 Sample Points Only*	
51	51-12	*Odd Shaped Cell - 11 Sample Points Only*	
52	52-1	9854.164	21893.918
52	52-2	9853.028	21795.496
52	52-3	9851.891	21697.074
52	52-4	9803.246	21746.457
52	52-5	9804.382	21844.879
52	52-6	9755.737	21894.261
52	**52-7**	**9754.600**	**21795.840**
52	52-8	9753.463	21697.418
52	52-9	9704.818	21746.802
52	52-10	9705.954	21845.224
52	52-11 / 50-3	9657.310	21894.607
52	52-12	9656.172	21796.185
52	52-13 / 49-1	9655.036	21697.763

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
53	53-1	9849.617	21500.230
53	53-2	9848.480	21401.808
53	53-3	9847.343	21303.386
53	53-4	9798.698	21352.771
53	53-5	9798.698	21451.197
53	53-6	9751.190	21500.576
53	**53-7**	**9751.190**	**21402.150**
53	53-8	9748.915	21303.732
53	53-9	9700.270	21353.115
53	53-10	9701.408	21451.537
53	53-11 / 49-3	9652.762	21500.920
53	53-12	9651.625	21402.498
53	53-13 / 48-1	9650.488	21304.078
54	54-1	9845.070	21106.545
54	54-2	9843.933	21008.123
54	54-3 / 55-9	9842.795	20909.701
54	54-4	9794.150	20959.084
54	54-5	9795.287	21057.506
54	54-6	9746.074	21106.890
54	**54-7**	**9745.505**	**21008.467**
54	54-8	9745.505	20910.041
54	54-9	9695.723	20959.429
54	54-10	9696.860	21057.851
54	54-11 / 48-3	9648.214	21107.234
54	54-12	9647.078	21008.812
54	54-13 / 47-1	9645.941	20910.390
55	55-1	10037.38	20712.16
55	55-2	9987.416	20647.730
55	55-3	9987.416	20761.556
55	55-4	9940.086	20810.935
55	55-5	9938.950	20712.513
55	55-6	9888.992	20648.289
55	**55-7**	**9890.304**	**20761.896**
55	55-8	9891.441	20860.318
55	55-9 / 54-3	9842.795	20909.701
55	55-10	9841.659	20811.279
55	55-11	9840.522	20712.857
55	55-12	*Missed-Not Surveyed*	*Missed-Not Surveyed*
55	55-13	*Missed-Not Surveyed*	*Missed-Not Surveyed*
	D1-1 (Located in Cell 55 - North end)	10040.474	20670.499
	D1-2 (Located in Cell 55 - North end)	10031.364	20647.713
	D1-3 (Located in Cell 55 - North end)	10049.967	20691.110

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

TABLE 1
SOIL SAMPLING LOCATIONS
Helena Sand And Gravel
Lake Helena Drive Proposed Gravel Pit
East Helena, Montana

Cell #	Sample Location	Northing[1]	Easting[1]
	D2-1 (Located in Cell 55 - South end)	9851.189	20780.699
	D2-2 (Located in Cell 55 - South end)	9851.664	20745.250
	D2-3 (Located in Cell 55 - South end)	9851.613	20817.675
	D3-1 (Located in Cell 47 - North end)	9585.438	20779.486
	D3-2 (Located in Cell 47 - North end)	9591.414	20745.300
	D3-3 (Located in Cell 47 - North end)	9579.683	20812.869
	D4-1 (Located in Cell 9)	8260.110	22646.486
	D4-2 (Located in Cell 9)	8239.753	22620.442
	D4-3 (Located in Cell 9)	8280.154	22671.739
	D5A-1 (Located in Cell 6)	8232.015	23764.002
	D5A-2 (Located in Cell 6)	8252.784	23750.610
	D5A-3 (Located in Cell 6)	8203.239	23777.307
	D5B-1 (Located in Cell 15)	8414.794	23572.474
	D5B-2 (Located in Cell 15)	8430.483	23546.419
	D5B-3 (Located in Cell 15)	8394.688	23595.911
	S1-1 (Located in Cell 45)	9309.701	21419.745
	S1-2 (Located in Cell 45)	9284.982	21395.025
	S1-3 (Located in Cell 45)	9351.104	21422.127
	Control Point #1	9979.5214	19820.002
	Control Point #2	8908.9774	20067.4774

[1] - Coordinates based on local control points established by Helena Sand and Gravel
- Bolded location is center of one acre sample grid (see Figure 3 for typical grid)

ATTACHMENT C
STANDARD OPERATING PROCEDURES

TABLE 2
Soil Sample XRF Results

CLIENT Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level +/-	As (ppm)	Confid Level +/-	Cd (ppm)	Confid Level +/-	COMMENTS
03/07/08	Ramoy E	Calibration	–	–	–	–	–	–	Time = 111.6 seconds Res = 217.8 E SCALE = 5.2595
↓	STD RCRA	180-436	593.3	39.2	478.0	36.4	504.2	22.3	60 seconds.
↓	BLANK 99.8%	–	ND	<8	ND <6		ND	<17	60 Seconds
2/13/08	AREA 1	Composite	785.6	24.7	86.2	19.7	ND	< 13	Shot # 17 120 sec
2/13/08	AREA 2	Composite	913.4	26.2	115.7	21.0	ND	< 12	120 Seconds. Shot #6
2/13/08	AREA 3	Composite	553.4	22.8	79.6	18.4	ND	<15	Shot # 12 120 sec
2/13/08	AREA 4	Composite	461.7	20.9	57.5	16.7	ND	< 14	Shot # 8 120 Sec
2/13/08	AREA 5	Composite	458.8	20.8	54.5	16.6	ND	<14	Shot # 9 120 Sec
2/13/08	AREA 6	Composite	409.2	19.3	68.1	15.7	ND	<14	Shot # 13 120 Sec
2/13/08	AREA 7	Composite	489.0	19.5	49.6	15.4	ND	<13	Shot # 7 120 Sec
2/13/08	AREA 8	Composite	532.4	20.5	75.0	16.5	ND	< 13	Shot #14 120 Sec
2/13/08	AREA 9	Composite	764.2	24.2	87.4	19.3	ND	< 13	Shot #16 120 Sec

XRF SN: XLt 793Y
OPERATOR: Randal English

TABLE 2
Soil Sample XRF Results

CLIENT Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level + / -	As (ppm)	Confid Level + / -	Cd (ppm)	Confid Level + / -	COMMENTS	
2/13/08 ~~03/07/08~~	AREA 10	Composite	654.2	22.8	65.6	18.0	ND	< 13	Shot # 18	120 Seconds
2/13/08	AREA 11	Composite	523.8	20.4	84.5	16.6	ND	< 13	Shot # 19	120 Seconds
2/13/08	AREA 12	Composite	412.9	18.6	58.6	15.0	ND	<13	Shot # 21	120 Seconds
2/13/08	AREA 13	Composite	599.1	21.7	69.4	17.3	ND	<13	Shot # 22	120 Seconds
2/15/08	AREA 14	Composite	440.3	18.9	50.5	15.0	ND	< 13	Shot # 23	120 Seconds
2/15/08	AREA 15	Composite	477.6	19.8	60.1	15.8	ND	<13	Shot # 24	120 Seconds
2/15/08	AREA 16	Composite	410.7	18.2	39.6	14.3	ND	< 13	Shot # 25	120 Seconds
2/15/08	AREA 17	Composite	437.9	18.7	45.8	14.8	ND	< 13	Shot # 26	120 Seconds.
2/15/08	AREA 18	Composite	513.7	20.7	66.4	16.6	ND	< 13	Shot # 27	120 Sec
2/13/08	AREA 19	Composite	409.3	18.5	66.1	15.0	ND	< 13	Shot # 28	120 Sec
2/13/08	AREA 20	Composite	469.1	19.5	66.5	15.7	ND	< 13	Shot # 29	120 Sec
2/13/08	AREA 21	Composite	482.0	20.2	62.5	16.2	ND	<13	Shot # 30	120 Sec

XRF: SN: XLt 793Y
OPERATOR: Randal English

TABLE 2
Soil Sample XRF Results

CLIENT Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level + / -	As (ppm)	Confid Level + / -	Cd (ppm)	Confid Level + / -	COMMENTS	
2/13/08	AREA 22	Composite	402.9	18.5	58.5	14.9	ND	< 13	Shot # 36	120 sec
2/14/08	AREA 23	Composite	529.3	20.5	64.1	16.3	ND	< 13	Shot # 35	120 sec
2/14/08	AREA 24	Composite	686.1	23.6	83.5	18.9	ND	< 13	Shot # 34	120 sec
2/14/08	AREA 25	Composite	407.5	17.5	50.0	14.0	ND	< 12	Shot # 38	120 sec
2/14/08	AREA 26	Composite	414.4	18.2	62.1	14.6	ND	< 13	Shot # 41	120 sec
2/14/08	AREA 27	Composite	540.3	20.5	73.9	16.5	ND	< 13	Shot # 42	120 sec
2/14/08	AREA 28	Composite	562.6	20.8	58.9	16.5	ND	< 13	Shot # 43	120 sec
2/14/08	AREA 29	Composite	508.0	20.1	61.9	16.0	ND	< 13	Shot # 44	120 sec
2/13/08	AREA 30	Composite	448.7	19.1	58.6	15.3	ND	< 13	Shot # 45	120 sec
2/13/08	AREA 31	Composite	410.4	18.1	62.6	14.7	ND	< 13	Shot # 47	120 sec
2/14/08	AREA 32	Composite	555.9	21.0	70.8	16.8	ND	< 13	Shot # 48	120 sec
2/13/08	AREA 33	Composite	531.0	20.2	78.8	16.3	ND	< 12	Shot # 50	120 sec

XRF SN: XLt 793Y
OPERATOR: Randal English

TABLE 2
Soil Sample XRF Results

CLIENT Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level + / -	As (ppm)	Confid Level + / -	Cd (ppm)	Confid Level + / -	COMMENTS	
2/13/08	AREA 34	Composite	500.7	19.6	68.0	15.7	ND	<13	Shot # 51	120 Sec
2/13/08	AREA 35	Composite	448.0	19.1	77.5	15.6	ND	<13	Shot # 52	120 Sec
2/13/08	AREA 36	Composite	423.1	18.4	58.1	14.7	ND	<13	Shot # 53	120 Sec
2/14/08	AREA 37	Composite	493.2	20.0	60.7	15.9	ND	<13	Shot # 54	120 Sec
2/14/08	AREA 38	Composite	457.9	18.9	52.6	15.0	ND	<13	Shot # 55	120 Sec
2/14/08	AREA 39	Composite	469.8	19.3	50.1	15.3	ND	<13	Shot # 57	120 Sec
2/14/08	AREA 40	Composite	430.5	18.6	52.2	14.8	ND	<13	Shot # 58	120 Sec
2/14/08	AREA 41	Composite	464.9	18.9	73.7	15.3	ND	<13	Shot # 59	120 Sec
2/14/08	AREA 42	Composite	444.8	18.9	49.2	15.0	ND	<13	Shot # 61	120 Sec
2/14/08	AREA 43	Composite	401.4	17.9	54.3	14.4	ND	<13	Shot # 62	120 Sec
2/14/08	AREA 44	Composite	406.7	17.7	56.1	14.2	ND	<13	Shot # 63	120 Sec
2/14/08	AREA 45	Composite	501.8	20.0	78.9	16.2	ND	<13	Shot # 64	120 Sec

XRF SN: XLt793Y.
OPERATOR: Randal English

TABLE 2
Soil Sample XRF Results

CLIENT: Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level + / -	As (ppm)	Confid Level + / -	Cd (ppm)	Confid Level + / -	COMMENTS	
2/14/08	AREA 46	Composite	488.2	19.6	66.5	15.7	ND	<13	Shot # 65	120 sec
2/14/08	AREA 47	Composite	561.2	20.7	53.9	16.3	ND	<13	Shot # 67	120 sec
2/14/08	AREA 48	Composite	568.3	20.0	80.2	16.3	ND	<13	Shot # 69	120 sec
2/14/08	AREA 49	Composite	438.7	18.8	48.9	14.9	ND	<13	Shot # 70	120 sec
2/14/08	AREA 50	Composite	436.1	18.4	59.5	14.8	ND	<13	Shot # 71	120 sec
2/14/08	AREA 51	Composite	638.2	22.2	69.1	17.6	ND	<13	Shot # 72	120 sec
2/14/08	AREA 52	Composite	434.3	18.5	44.2	14.6	ND	<13	Shot # 73	120 sec
2/14/08	AREA 53	Composite	459.1	19.0	54.4	15.1	ND	<13	Shot # 74	120 sec
2/14/08	AREA 54	Composite	397.0	17.6	48.8	14.0	ND	<12	Shot # 75	120 sec
2/14/08	AREA 55	Composite	438.1	18.5	44.8	14.6	ND	<13	Shot # 76	120 sec
2/19/08	Swell 1	Swell/Ditch	536.1	22.1	95.8	17.9	ND	<13	Shot # 77	120 sec

XRF SN: XLt 793Y
OPERATOR: RANDAL English

03/07/08 RWE

TABLE 2
Soil Sample XRF Results

CLIENT: Helena Sand and Gravel
SITE NAME: Lake Helena Drive Gravel Pit
LOCATION: East Helena, Montana

SAMPLE DATE	NAME	LOCATION TYPE	Pb (ppm)	Confid Level + / -	As (ppm)	Confid Level + / -	Cd (ppm)	Confid Level + / -	COMMENTS
2/19/08	Ditch 1	Swell/Ditch	378.0	17.5	55.5	14.1	ND	<13	Shot# 78 120 sec
2/19/08	Ditch 2	Ditch	477.9	18.9	85.3	15.5	ND	<12	Shot# 79 120 sec
2/19/08	Ditch 3	Ditch	390.6	17.8	47.2	14.2	ND	<13	Shot# 80 120 sec
* 2/19/08	Ditch 4	Ditch	1592	40	193.3	31.8	ND	<15	"Dark Brown Soil" Shot# 81 "Sample Contains Debris" 120 sec
2/19/08	Ditch 5	Ditch	250.5	14.5	27.4	11.5	ND	<13	Shot# 82 120 sec
2/19/08	Ditch 5b	Ditch	257.4	15.5	32.0	12.3	ND	< 14	Shot# 83 120 sec.

Samples by: RWE Analysis by: RWE Instrument: Niton XRF XLt 793Y

* Ditch #4, this Soil Sample contains Debris such As Broken Glass, metal ect.
Sample was Re-Analyzed with Shot #84 Results As follows:

Pb	+/-	As	+/-	Cd	+/-
1612	40	163.0	32.0	ND	<15

TETRA TECH, INC.

November 02, 2007

Mr. Jerry Bowser
Mr. Scott Olsen
Helena Sand & Gravel
PO Box 5960
Helena, Montana 59604

RE: Soil Sampling Results
Valley View Property
East Helena, Montana

Dear Jerry and Scott:

Tetra Tech Inc. is pleased to submit this letter report of soil sampling conducted at the Valley View property located approximately 1.2 miles north of the intersection of West Main Street and South Montana Avenue (Figure 1) in East Helena. This report is being provided per the Scope of Work dated October 19, 2007.

SAMPLE SITE SELECTION

Sample locations were selected during a site walk with Daryl Reed (Montana Department of Environmental Quality (MDEQ) and Debb Tillo (Lewis and Clark City-County Health Department, Lead Education and Abatement Program) on October 24, 2007. Fourteen locations were staked across the site with preference being given to flood channels (swales) and potential ponded flood areas.

Soil samples collected from swales involved three (3) subsample locations within the centerline of the swale that were combined as a representative sample for that swale. Soil samples collected from ponded flood areas involved 13 subsample locations from a one (1) – acre area that were combined as a sample representative of that location. In both instances (i.e., swale and one (1)-acre area), sample points shown on the site map are the "center" of the sample location.

Two (2) additional one (1) acre sample locations (VV-09 and VV-16) were sampled by Tetra Tech interior to the proposed sand and gravel excavation site. VV-09 and VV-16 samples also consisted of soil from 13 subsamples and were combined as the sample representative of that location. The method of combining soil samples from subsample locations, to form a sample representative of that site, was in agreement with on-site conversations with Mr. Reed and Ms. Tillo. A total of 16 samples were taken as shown on Figure 2.

SAMPLING METHOD, ANALYSIS, AND RESULTS

Soil samples were collected manually and analyzed using a hand-held x-ray fluorescence (XRF) instrument. Details regarding the collection, analysis, and results are provided in Attachment A and on Figure 2.

303 Irene Street, Helena, MT 59601
Tel 406.443.5210 Fax 406.449.3729
www.tetratech.com

Tetra Tech appreciates the opportunity to provide Helena sand & Gravel with environmental services at the Valley View Property. Please contact me at (406) 443-5210 when we can be of further service.

Sincerely,

C. R. Windmueller

C. Ray Windmueller
Project Engineer

Attachments: Figure 1
Figure 2
Attachment A (5 pages)

ATTACHMENT A-1

Sampling Collection, Preparation, and Analysis Methods
VALLEY VIEW SITE
EAST HELENA, MONTANA

SAMPLE COLLECTION

Flood Channel (swale) Samples:

- Center of sampling location is staked;
- Upstream and downstream samples are located 50-feet upstream and downstream from center stake;
- Composite samples were taken from three (3) subsample locations at a depth of 0 (zero) inches to one (1) inch in depth from ground surface;
- Subsamples were combined in a one (1)-quart plastic sample bag. Approximately 1/3 of a quart of soil was collected from each subsample location for a total of one (1) quart; and
- Sample locations are labelled with a VV-nn (s) where:
  - VV = Valley View property
  - nn = sample number
  - (s) = swale

Ponded Flood Areas / Other Areas:

- Center of sampling location staked;
- Corner stakes (NW, NE, SE, and SW) established to encompass approximately one (1) acre;
- Soil subsamples taken from 13 locations[1] within the one (1) acre area. Sample grid as shown on Attachment A-2;
- Three (3) to four (4) composite samples each placed in one (1) quart-sized sample bag; and
- "Area" sample locations are labelled with a VV-nn (a) where:
  - VV = Valley View property
  - nn = sample number
  - (a) = area

SAMPLE PREPARATION AND ANALYSIS

- Samples were homogenized (stirring for one (1) minute) then screened using a number 10 sieve;

[1] 13 composite sample locations were established for sample symmetry

- Sufficient material was screened to fill a one (1) – quart plastic Ziploc™ bag to 50% capacity;
- Soil to be tested was positioned in the bag to at least one (1)-inch in thickness;
- XRF instrument was checked against calibration standards that included lead, arsenic, and cadmium prior to and post analysis (Attachment A-3);
- Samples were analyzed using the XRF through the Ziploc™ plastic bag and data recorded on Attachment A-3

Attachment A-2

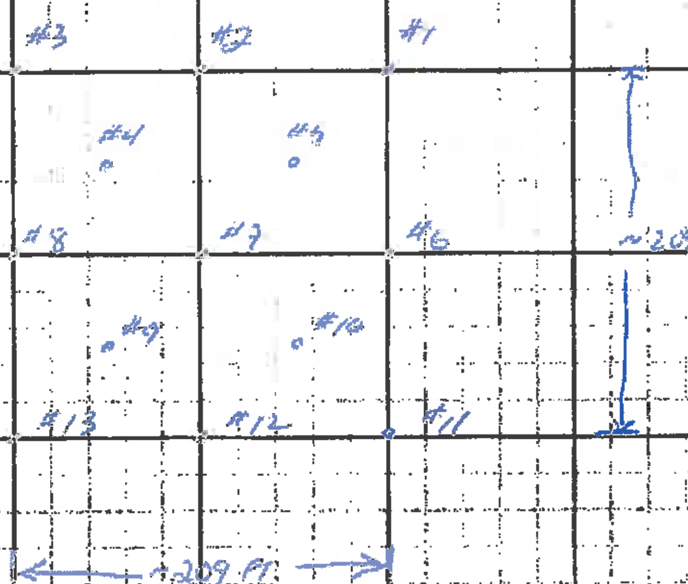
TETRA TECH

CLIENT: HS&E DATE: [illegible]

JOB TITLE: Valley View - L. Hess JOB NUMBER:

SUBJECT: Soil Sampling Grid BY: CRW SHEET 1 of 1

ONE (1) ACRE SAMPLE GRID



#1 = SUBSAMPLE (for composite) NUMBER

#7 = "SURVEY" POINT SHOWN ON SITE SAMPLE LOCATION MAP

AS POINT VV-nn (a) where:

VV = Valley View Property

nn = Sample Number

(a) = area sample

Attachment A-3

CLIENT: Helena Sand & Gravel
SITE NAME: Valley View
LOCATION: East Helena, MT

SAMPLE DATE	NAME	LOCATION DESCRIPTION	Pb	Confid Level +/-	As	Confid Level +/-	Cd	Confid Level +/-	COMMENTS
10/25/07 1004	VV-01(S)	Swale / Flood Channel	1144	51	77	34	< 29 LOD	-	Limit of Detection
10/25/07 1030	VV-02(S)	Swale	950	52	121	36	< 28 LOD	-	
10/25/07 1100	VV-03(S)	Swale	954	52	99	35	< 27 LOD	-	
10/25/07 1110	VV-04(S)	Swale	1353	63	175	44	30	19	
10/25/07 1200	VV-05(A)	"Area", 1 Acre	941	51	73	35	< 27 LOD	-	
10/25/07 1350	VV-06(A)	Area, 1 Acre	1012	56	58	37	< 28 LOD	-	
10/25/07 1455	VV-07(A)	Area, 1 Acre	916	53	39	36	< 28 LOD	-	
10/25/07 1515	VV-08(S)	Swale, Junk Trench	1417	60	61	40	< 26 LOD	-	
10/25/07 1550	VV-09(A)	Area, 1 Acre	398	35	43	24	< 28 LOD	-	
10/25/07 1630	VV-10(A)	Area, 1 Acre	453	37	53	25	< 27 LOD	-	
10/25/07 1730	VV-11(S)	Swale	653	45	46	30	< 28 LOD	-	
10/25/07 1805	VV-12(A)	Area, 1 Acre	773	50	105	35	< 29 LOD	-	
10/25/07 1815	VV-13(S)	Swale	1711	72	113	49	< 28 LOD	-	

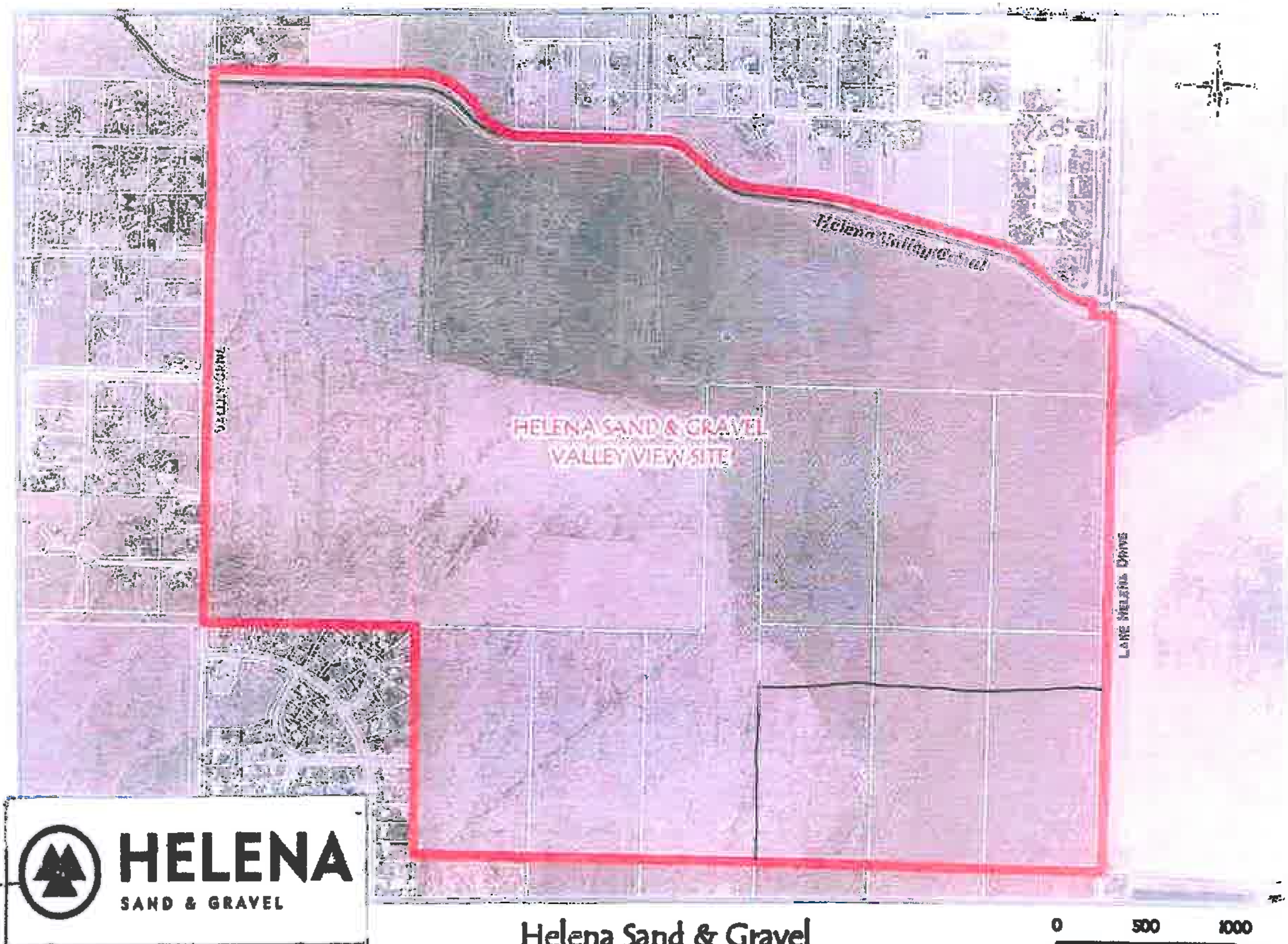
Attachment A-3

CLIENT: HELENA SAND & GRAVEL
SITE NAME: VALLEY VIEW
LOCATION: EAST HELENA, MT

SAMPLE DATE	NAME	LOCATION DESCRIPTION	Pb	Confid Level +/-	As	Confid Level +/-	Cd	Confid Level +/-	COMMENTS
10/25/06 1530	VV-14(s)	SWALE	1053	54	83	37	<27 LOD		
10/20/06 1550	VV-15(s)	SWALE	553	37	<37 LOD	-	<34 LOD		
10/20/06 1500	VV-16(s)	AREA / ACRE	452	37	<37 LOD	-	<29 LOD	-	
10/26/06	-	Pre Calibration Check	10066	158	657	104	47	33	
10/26/06		Post Calibration Check	5248	135	617	94	<30	-	
10/26/06		STANDARD	5532		626	-	22		

Samples by: CRW   Analysis by: CRW   Instrument: NITON XRF MODEL XLt 999KWY
S/N 11747
MNFR DATE 10/25/06

Figure 1



Relative locations of features and boundary lines are approximate.
A field survey is recommended for precise locations.

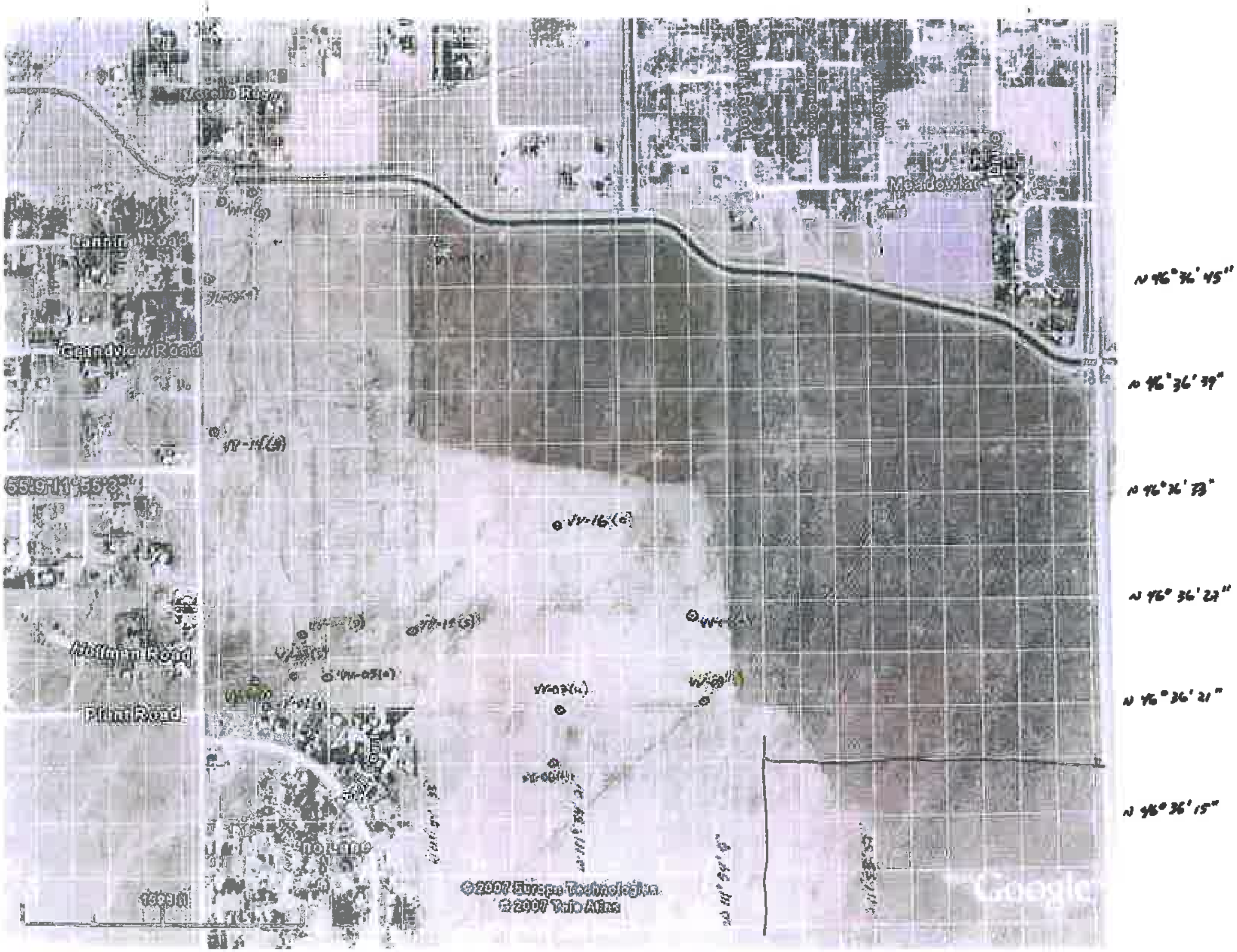
Helena Sand & Gravel

Valley View Site

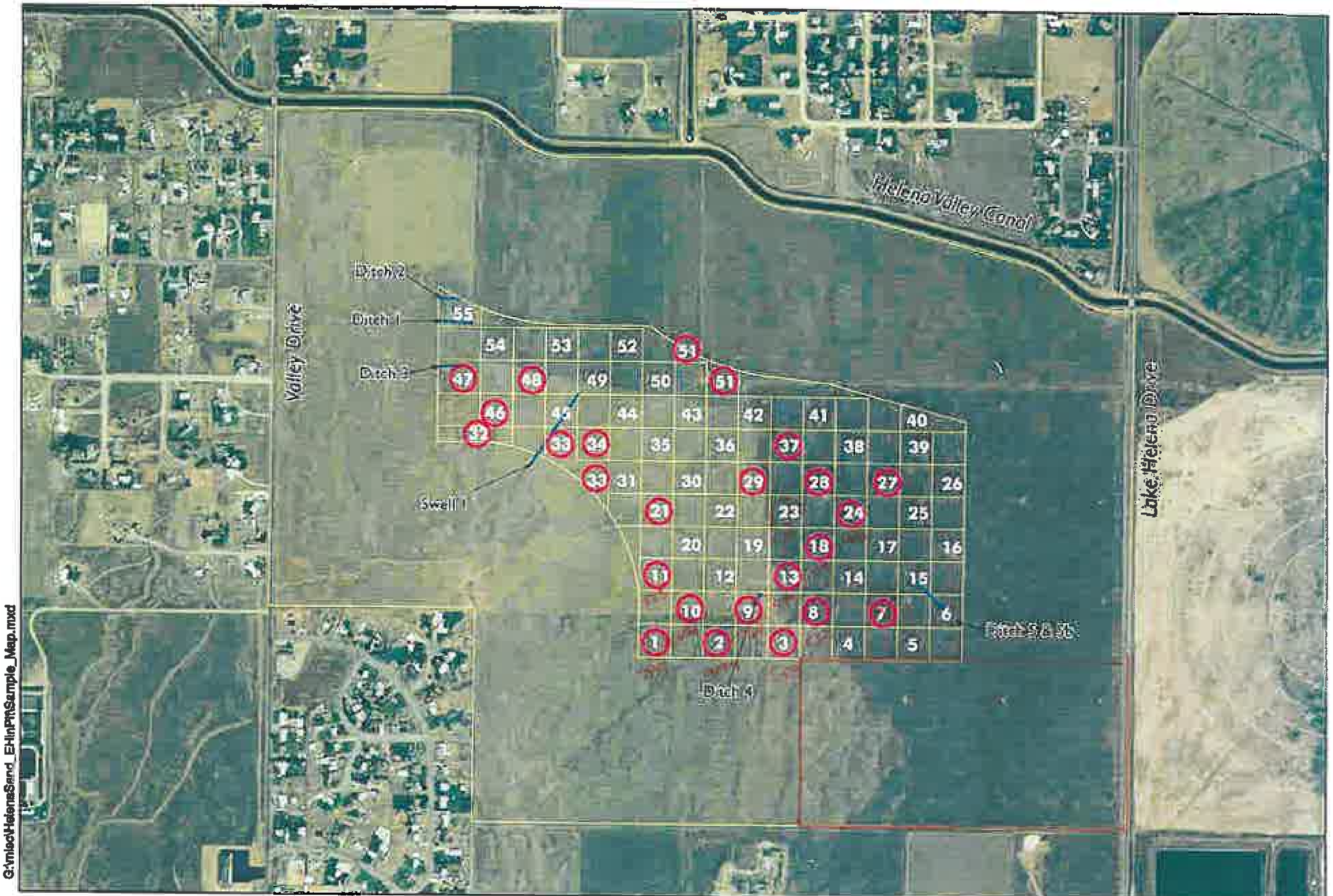
0 500 1000 Feet

Scale: 1:9000 1 inch = 750 feet

Figure 2



N 46°36'45"
N 46°36'39"
N 46°36'33"
N 46°36'27"
N 46°36'21"
N 46°36'15"
Morello Road
Lannin Road
Grandview Road
Meadowlark
Holtman Road
Flint Road
VV-16(c)
© 2007 Europa Technologies
© 2007 Tele Atlas
Google



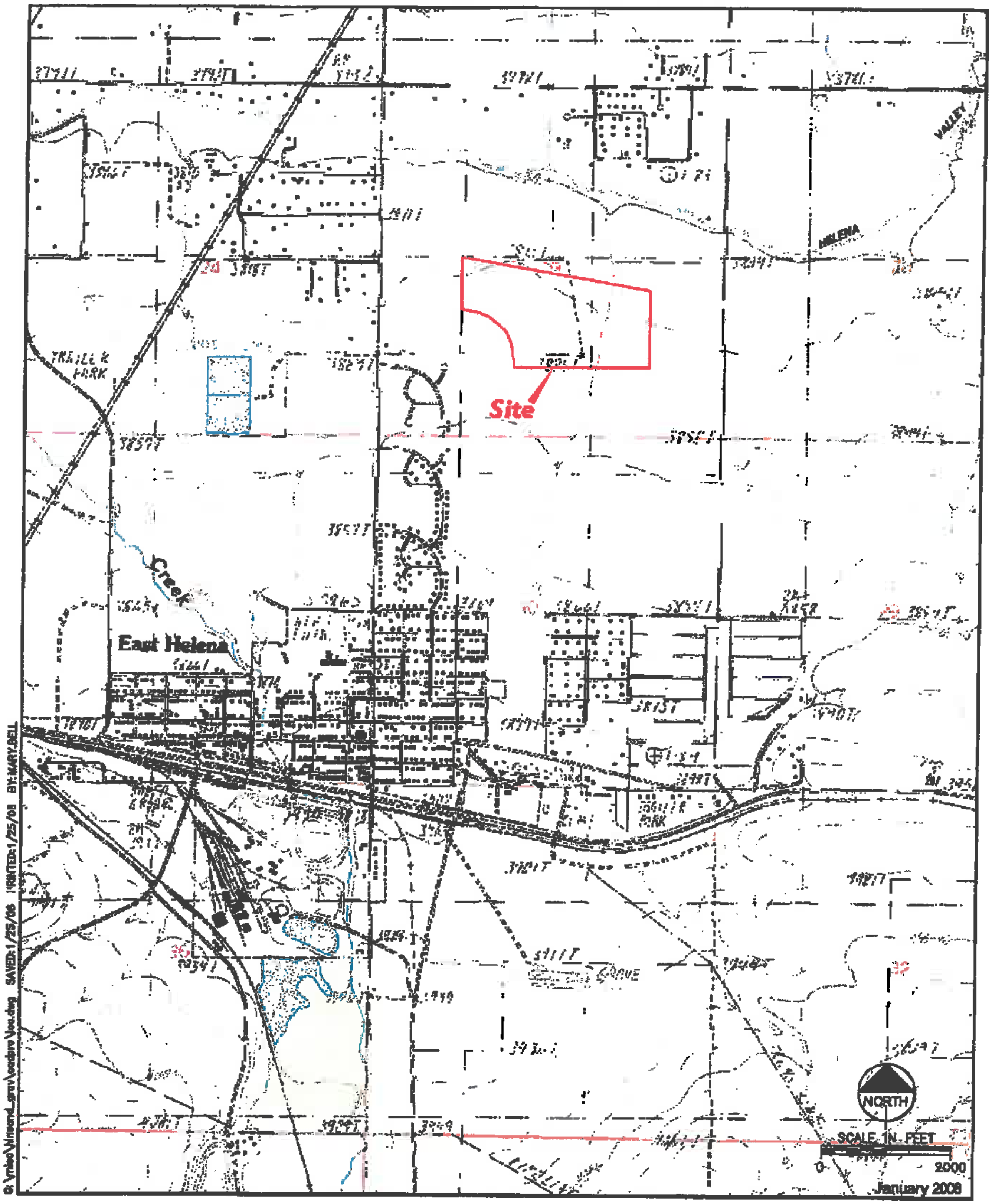
2005 Montana NAIP Aerial Photograph

Exceeds 500 ppm Lead

Approximate Ditch Location

Scale in Feet: 0, 500, 1,000

Site Wide Sampling Grid
Proposed - Lake Helena Drive Gravel Pit
East Helena, Montana
FIGURE 2



Property Permit Area

Location Map
Proposed - Lake Helena Drive Pit
Helena, Montana
FIGURE 1

8551851.100

2004 EAST HELENA XRF SOILS ANALYSES

SECTOR	SAMPLE NUMBER (1)	LAB NUMBER	SAMPLE DATE	SAMPLE TIME	SAMPLE DEPTH in. (2)	SAMPLE TYPE (3)	ANALYSIS DATE	Pb (ppm)	As (ppm)	Cd (ppm)	U95 Pb VALUE (4) (ppm)	COMMENTS	Pb FIELD REPLICATE (RPD) (5)
						SITE CODE:VA01-H26							
						PRE SOIL CONCENTRATIONS							
P1.1	PRE-VA01-H26-P1.1	04R-03126	06/17/20	1400	0-2	PRE	06/30/20	388	67	20	461		
P1.2	PRE-VA01-H26-P1.2	04R-03127	06/17/20	1410	2-4	PRE	06/30/20	298	58	6	371		
P1.3	PRE-VA01-H26-P1.3	04R-03128	06/17/20	1420	4-6	PRE	06/30/20	204	54	10	277		
P1.4	PRE-VA01-H26-P1.4	04R-03129	06/17/20	1430	6-8	PRE	06/30/20	93	42	6	166		
P1.5	PRE-VA01-H26-P1.5	04R-03130	06/17/20	1440	8-12	PRE	06/30/20	17	43	8	90		
P1.6	PRE-VA01-H26-P1.6	04R-03131	06/17/20	1450	12-18	PRE	06/30/20	20	41	< 5	93		
P1.7	PRE-VA01-H26-P1.7	04R-03132	06/17/20	1500	18-24	PRE	06/30/20	28	35	11	101		

Notes: (1) P = Pit Sample; GS = Garden Sample; R = Replicate; GA = Garage Sample; TR = Tree Roots.
(2) Depth at which samples were taken. For PST samples the excavation depth was used; * = Final Excavation Depth.
(3) PRE = Pre Removal Sample; PST = Post Removal Sample; DH = Direct Haul Sample; CM = Continuous Monitoring Sample; NON = Nondisturbed sampling area; DIS=urbed sampling area; (4) Upper 95% Confidence Value for lead
(5) Relative Percent Difference; E.P.A. Quality Control Standard - less than 28%.

2004 EAST HELENA XRF SOILS ANALYSES

SECTOR	SAMPLE NUMBER (1)	LAB NUMBER	SAMPLE DATE	SAMPLE TIME	SAMPLE DEPTH in. (2)	SAMPLE TYPE (3)	ANALYSIS DATE	Pb (ppm)	As (ppm)	Cd (ppm)	U95 Pb VALUE (4) (ppm)	COMMENTS	Pb FIELD REPLICATE (RPD) (5)

SITE CODE:VA01-J23

PRE SOIL CONCENTRATIONS

SECTOR	SAMPLE NUMBER (1)	LAB NUMBER	SAMPLE DATE	SAMPLE TIME	SAMPLE DEPTH in. (2)	SAMPLE TYPE (3)	ANALYSIS DATE	Pb (ppm)	As (ppm)	Cd (ppm)	U95 Pb VALUE (4) (ppm)	COMMENTS	Pb FIELD REPLICATE (RPD) (5)
P1.1	PRE-VA01-J23-P1.1	04R-03133	06/17/20	1510	0-2	PRE	06/30/20	697	44	76	770		
P1.2	PRE-VA01-J23-P1.2	04R-03134	06/17/20	1520	2-4	PRE	06/30/20	254	42	14	327		
P1.3	PRE-VA01-J23-P1.3	04R-03135	06/17/20	1530	4-6	PRE	06/30/20	187	42	< 5	260		
P1.4	PRE-VA01-J23-P1.4	04R-03136	06/17/20	1540	6-8	PRE	06/30/20	205	48	< 5	278		
P1.5	PRE-VA01-J23-P1.5	04R-03137	06/17/20	1550	8-12	PRE	06/30/20	74	35	< 5	147		
P1.6	PRE-VA01-J23-P1.6	04R-03138	06/17/20	1600	12-18	PRE	06/30/20	44	36	< 5	117		
P1.7	PRE-VA01-J23-P1.7	04R-03139	06/17/20	1610	18-24	PRE	06/30/20	33	37	< 5	106		+/-6, 20.0
P1.7	PRE-VA01-J23-P1.7D	04R-03140	06/17/20	1620	18-24	PRE	06/30/20	27	36	< 5	100		

Notes: (1) P = Pit Sample; GS = Garden Sample; R = Replicate; GA = Garage Sample; TR = Tree Roots.
(2) Depth at which samples were taken. For PST samples the excavation depth was used; * = Final Excavation Depth.
(3) PRE = Pre Removal Sample; PST = Post Removal Sample; DH = Direct Haul Sample; CM = Continuous Monitoring Sample; NON = Nondisturbed sampling area; DIS= urbed sampling area; (4) Upper 95% Confidence Value for lead
(5) Relative Percent Difference; E.P.A. Quality Control Standard - less than 20%.

2004 EAST HELENA XRF SOILS ANALYSES

SECTOR	SAMPLE NUMBER (1)	LAB NUMBER	SAMPLE DATE	SAMPLE TIME	SAMPLE DEPTH in.(2)	SAMPLE TYPE (3)	ANALYSIS DATE	Pb (ppm)	As (ppm)	Cd (ppm)	U95 Pb VALUE (4) (ppm)	COMMENTS	Pb FIELD REPLICATE (RPD) (5)
	SITE CODE:VA01-E26												
	PRE SOIL CONCENTRATIONS												
P1.1	PRE-VA01-E26-P1.1	04R-03148	06/18/20	1040	0-2	PRE	06/30/20	906	114	48	979		
P1.2	PRE-VA01-E26-P1.2	04R-03149	06/18/20	1050	2-4	PRE	06/30/20	291	54	7	364		
P1.3	PRE-VA01-E26-P1.3	04R-03150	06/18/20	1100	4-6	PRE	06/30/20	152	47	< 5	225		
P1.4	PRE-VA01-E26-P1.4	04R-03151	06/18/20	1110	6-8	PRE	06/30/20	24	38	6	97		
P1.5	PRE-VA01-E26-P1.5	04R-03152	06/18/20	1120	8-12	PRE	06/30/20	20	37	< 5	93		
P1.6	PRE-VA01-E26-P1.6	04R-03153	06/18/20	1130	12-18	PRE	06/30/20	8	41	< 5	81		
P1.7	PRE-VA01-E26-P1.7	04R-03154	06/18/20	1140	18-24	PRE	06/30/20	28	34	< 5	101		*OUT* +/-2
P1.7	PRE-VA01-E26-P1.7D	04R-03155	06/18/20	1150	18-24	PRE	07/01/20	7	40	8	80		

Notes: (1) P = Pit Sample; GS = Garden Sample; R = Replicate; GA = Garage Sample; TR = Tree Roots.
(2) Depth at which samples were taken. For PST samples the excavation depth was used; * = Final Excavation Depth.
(3) PRE = Pre Removal Sample; PST = Post Removal Sample; DH = Direct Haul Sample; CM = Continuous Monitoring Sample; NON = Nondisturbed sampling area; DIS=urbed sampling area; (4) Upper 95% Confidence Value for lead
(5) Relative Percent Difference; E.P.A. Quality Control Standard - less than 28%.

2004 EAST HELENA XRF SOILS ANALYSES

SITE CODE:VA01-B24

PRE SOIL CONCENTRATIONS

SECTOR	SAMPLE NUMBER (1)	LAB NUMBER	SAMPLE DATE	SAMPLE TIME	SAMPLE DEPTH in.(2)	SAMPLE TYPE (3)	ANALYSIS DATE	Pb (ppm)	As (ppm)	Cd (ppm)	U95 Pb VALUE (4) (ppm)	COMMENTS	Pb FIELD REPLICATE (RPD) (5)
P1.1	PRE-VA01-B24-P1.1	04R-03141	06/18/20	0930	0-2	PRE	06/30/20	2340	124	83	2413		
P1.2	PRE-VA01-B24-P1.2	04R-03142	06/18/20	0940	2-4	PRE	06/30/20	433	81	13	506		
P1.3	PRE-VA01-B24-P1.3	04R-03143	06/18/20	0950	4-6	PRE	06/30/20	221	61	8	294		
P1.4	PRE-VA01-B24-P1.4	04R-03144	06/18/20	1000	6-8	PRE	06/30/20	57	56	< 5	130		
P1.5	PRE-VA01-B24-P1.5	04R-03145	06/18/20	1010	8-12	PRE	06/30/20	31	50	< 5	104		
P1.6	PRE-VA01-B24-P1.6	04R-03146	06/18/20	1020	12-18	PRE	06/30/20	24	38	< 5	97		
P1.7	PRE-VA01-B24-P1.7	04R-03147	06/18/20	1030	18-24	PRE	06/30/20	13	38	< 5	86		

Notes: (1) P = Pit Sample; GS = Garden Sample; R = Replicate; GA = Garage Sample; TR = Tree Roots.
(2) Depth at which samples were taken. For PST samples the excavation depth was used; * = Final Excavation Depth.
(3) PRE = Pre Removal Sample; PST = Post Removal Sample; DH = Direct Haul Sample; CM = Continuous Monitoring Sample; NON = Nondisturbed sampling area; DIS=urbed sampling area; (4) Upper 95% Confidence Value for lead
(5) Relative Percent Difference; E.P.A. Quality Control Standard - less than 28%.

East Fields

East Helena Residential Soils Removal Action Grass Yield and Metal Loadings From Eight Treatments at Three Lead Isocontours in the Asarco East Field 1994 Treatability Test Plot Results

- Volume 1 Text -

Prepared For:

ASARCO Incorporated

Salt Lake City, Utah

Prepared By:

Hydrometrics, Inc.

Consulting Scientists, Engineers, and Con[illegible]

4070200/
150122

April 1996

UPDATE TIME: 11:57AM
007\ 0005\045\0035\HEL\041696\I\COVERS\ C0059601.DWG

Hydrometrics, Inc.

2727 Airport Road • Helena, Montana 59601 • (406) 443-4150 • FAX (406) 443-4155

April 19, 1996

Mr. Scott Brown
Remedial Project Manager
U.S. Environmental Protection Agency
301 South Park Avenue
Helena, MT 59626

Re: 1994 Asarco East Field Treatability Test Plot Results

Dear Scott,

Enclosed for your review is a copy of the 1994 Treatability Test Plot Results for the East Field which lies adjacent to the Asarco Smelter in East Helena, Montana. Results from this experiment indicate that the best remediation management practice for yield of grasses grown on the East Field, independent of metal concentrations, is a residential soil cap, either as a 6-inch cap or as a 12-inch cap. These caps out-performed all other treatments in terms of vegetation production and percent cover. The experiment also determined that capping is not necessary to give optimum yields at the 2000 mg/kg lead isocontour in the East Field. Liming alone gave similar results. By not capping at the 2000 mg/kg lead isocontour, residential soils potentially scheduled for capping in this area could be utilized as a thicker, more protective cap, i.e., greater than 12 inches, at the 3000 mg/kg lead isocontour west of the Montana City Highway, where the data showed that substrate metals may be limiting vegetative yield on a 12-inch residential soil cap.

The Baker Plow was not available when treatment selections were made for the East Field Test Plots. Data from the Baker Plow Demonstration at the 1700 mg/kg lead isocontour in the East Field showed that the plow was effective in reducing surface lead concentrations to about 500 mg/kg, which is less than lead concentrations in the treatments using residential caps. The plow also distributed deeper calcareous (higher pH) materials throughout the plow zone, raising the mean surface pH to approximately 7.9. Results from the Baker Plow Demonstration also suggest that capping may not be necessary at the 2000 mg/kg lead isocontour; rather, by Baker Plowing to reduce surface metals concentrations, vegetative yields likely would be similar to or better than treatments using residential caps. An additional benefit of using the "plow", instead of a residential soil cap, at the 2000 mg/kg lead isocontour would be that liming, to reduce phytotoxicity and bioavailablility of metals by raising soil pH, may not be necessary.

If you have questions or comments, please call me at (406) 443-4150.

Sincerely,

Jay Spickelmier

Jay Spickelmier
CERCLA Manager

Enclosure

c: Doug Dollhopf, MSU-RRU
Dennis Newman, MSU-RRU
Bill Bluck, WBEI
James Scott, MDHES
Don Robbins, Asarco, SLC

Scott:
We have this document in the files.
Vol 1 4070200/450122
Vol. 2 4070200/450123

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EAST HELENA RESIDENTIAL SOILS REMOVAL ACTION

GRASS YIELD AND METAL LOADINGS FROM

EIGHT TREATMENTS AT THREE LEAD ISOCONTOURS IN THE

ASARCO EAST FIELD

1994 TREATABILITY TEST PLOT RESULTS

Prepared for:

ASARCO Incorporated
3422 South 700 West
Salt Lake City, UT 84119

Prepared by:

Hydrometrics, Inc.
2727 Airport Road
Helena, MT 59601

April 1996

EXECUTIVE SUMMARY

INTRODUCTION

In September of 1984, the U.S. Environmental Protection Agency (EPA) listed the community of East Helena and the ASARCO Incorporated plant, which is located just south of East Helena, on the National Priorities List (NPL) pursuant to the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), i.e., Superfund. The Asarco East Helena lead smelter operation, which recovers base metals from ore concentrates using pyrometallurgical processes, contributed elevated metals concentrations to the surrounding area, including East Helena residential yards and agricultural land east of the smelter.

In 1991, the EPA issued a two part Statement of Work (SOW) outlining guidance for the following actions:

- Excavation And Removal of Residential Soils.
- Focused Feasibility Study (FFS) On The Location And Method of Disposal of East Helena Soils, East Helena, Montana.

The Focused Feasibility Study determined disposal alternatives for East Helena, Montana residential soils being excavated pursuant to CERCLA. Alternatives were also evaluated, in conjunction with residential soil alternatives, for remediation of Asarco property east of the smelter facility, i.e., the East Field. The East Field is a former pasture which exhibits phytotoxic effects of metals, either in stressed vegetation or as large areas where no vegetation is present at all.

Scope of the Investigation

The objective of this investigation was to evaluate various components of the East Field remedial alternatives identified in the FFS (including excavation and capping) in terms of their site specific effects on soil metals, vegetation yield and vegetation metal loadings. To evaluate these effects, a field experiment was designed consisting of eight treatments replicated four times at three distinct lead isocontours (1,500 mg/kg, 2,000 mg/kg and 3,000 mg/kg) in the East Field. The results from this field experiment will assist the regulatory agencies in determining the best end-use for the East Field, allowing for protection of human health and the environment.

Results of the Investigation

Location and treatment both had significant influences on vegetative yield from perennial grasses grown on treatability plots located in the Asarco East Field. Treatment appeared to be the most important factor. Several treatments had mean soil Pb, As and Zn concentrations above levels which are considered to be toxic to many plants. These same treatments had excellent grass yield which was measured by production and % cover. Results from this experiment indicate that the best remediation management practice for yield of grasses grown on the East Field, independent of metal concentrations, is a residential soil cap, either as a 6" or a 12" cap. These treatment caps out-performed all other treatments in terms of vegetative production and % cover. They averaged greater than 2500 lbs/acre of production and greater than 70 % cover.

Our results suggest that, to date, the grass species tested in this experiment are more tolerant to soil metals than indicated in the literature. One explanation for this apparent divergence of plant response from well established responses cited in literature is that East Field soils generally have neutral to slightly alkaline soil pHs (Hydrometrics, 1995). At these pHs, a significant percentage of soil metals may be bound in compounds of low solubility. This would lessen their potential for phytotoxicity as compared to soils of a more acidic nature. Total soil metal concentrations are not the only indicators of potential phytotoxic effects, as the bioavailability of metals is dependent on soil pH, organic matter, cation exchange capacity and on plant sensitivity. Applying universal phytotoxic hazards to certain soil metal concentrations is difficult because of these variations.

Excavation treatments had the lowest soil metals concentrations. However, in terms of vegetative metals loadings, they offered no advantage over the residential soil caps. Their vegetative lead and cadmium loadings were similar to the residential caps. Additionally, their arsenic loadings were actually significantly higher than the residential soil caps. Vegetative zinc loadings were higher in the residential caps than in the excavation treatments, though they pose neither a phytotoxic or grazing hazard.

None of the treatments tested produced vegetative metal loadings that would present a phytotoxic hazard. All treatments yielded vegetative lead and cadmium loadings that exceed National Research Council (NRC) recommended forage concentrations chronically tolerated by livestock. Some location/treatment interactions from Plot A (1500 mg/kg Pb isocontour) did have vegetative lead loadings below the NRC recommended levels. Vegetative arsenic and zinc loadings from all treatments were less than NRC recommended levels for livestock.

Concurrent removal of East Helena residential soils and the East Field remediation presents a unique opportunity, where residential soils offer great potential as a remediation resource for the East Field. Review of the data shows that a two tiered approach may best utilize the residential soil resource while remediating the East Field. Capping is not necessary to give optimal yields at the 2000 mg/kg Pb isocontour. Liming alone gives similar results. Residential soils identified in the FFS for capping at the 2000 mg/kg Pb isocontour could be better utilized as a thicker more protective cap, i.e., greater than 12", at the 3000 mg/kg Pb isocontour, where the data shows that substrate metals may be limiting vegetative yield on a 12" cap.

EAST HELENA RESIDENTIAL SOILS REMOVAL ACTION

GRASS YIELD AND METAL LOADINGS FROM

EIGHT TREATMENTS AT THREE LEAD ISOCONTOURS IN THE

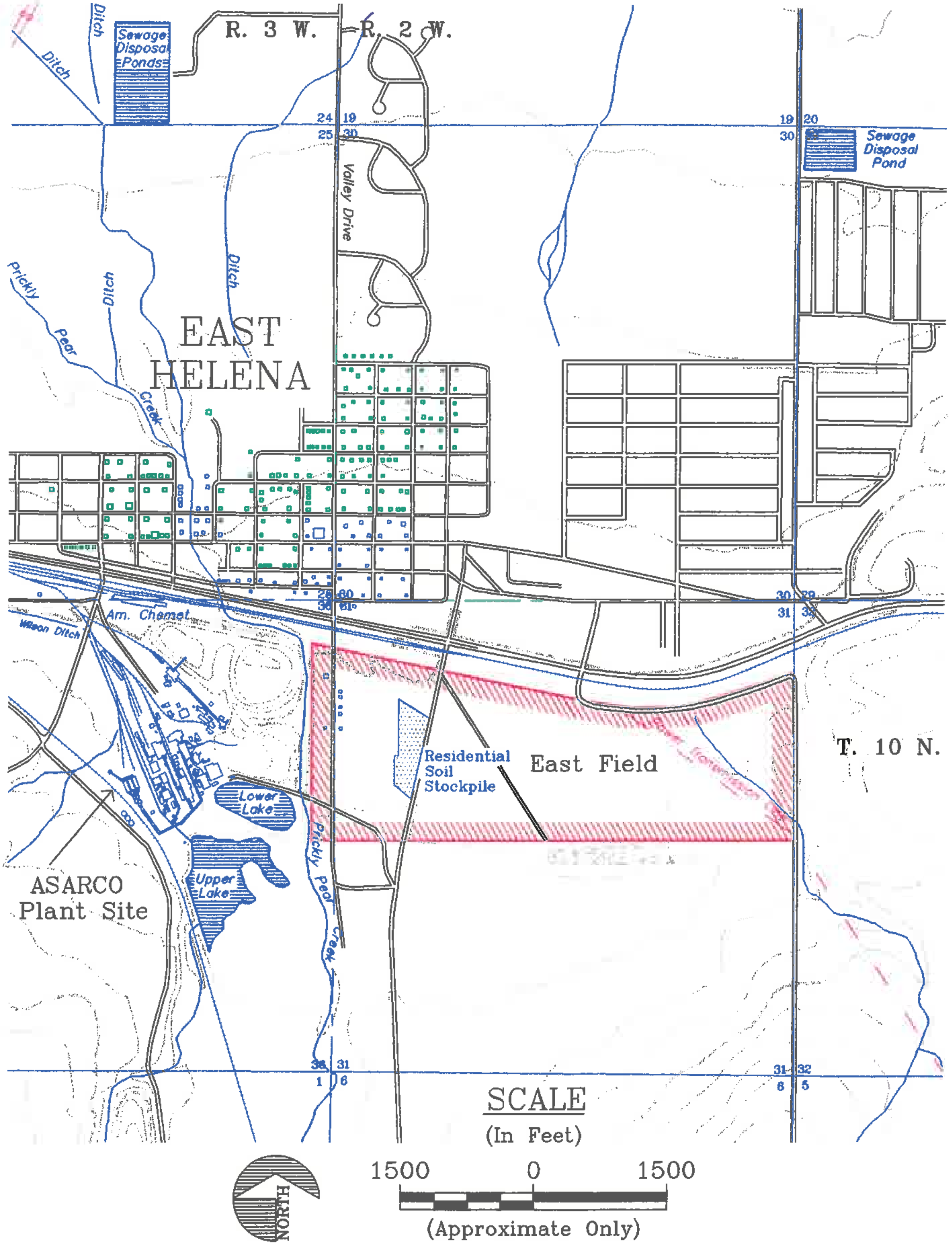
ASARCO EAST FIELD

1994 TREATABILITY TEST PLOT RESULTS

1.0 INTRODUCTION

The East Field treatability test plots were designed to facilitate an evaluation of remedial alternatives for the location and disposal of East Helena residential soils. The Remedial Investigation/Feasibility Study (Hydrometrics, 1990) and the Focused Feasibility Study (FFS) (Hydrometrics, 1993) identified the East Field as a potential repository for the excavated soil from East Helena (Figure 1-1). As a result of its proximity to the smelter and being generally downwind, East Field soils contain elevated levels of lead, arsenic, cadmium and zinc which contribute to severe metals toxicity in field vegetation. In addition to evaluating disposal alternatives for residential soils, the treatability test plots were also designed to evaluate various remedial treatments for East Field soils.

Given a range of land use scenarios for the East Field, forage arsenic and metals pose the greatest risk to grazers. The experiment evaluates the effects that soil metals and remediation treatments have on forage yields and metal loadings. The objectives of the experiment were to: (i) determine the effect remediation techniques have on surface soils, forage yield and forage metals loadings and (ii) determine whether significant correlations exist between pre- and post-treatment surface metals concentrations and forage yield and metals loadings. Both management (treatment) and environmental (metals) variables affect forage yield. An understanding of how these factors differentially affect yield will allow informed decisions to be made when selecting remediation approaches for the East Field.



1994 TREATABILITY TEST PLOT RESULTS ASARCO EAST FIELD	GENERAL LOCATION MAP	FIGURE 1-1

Additionally, results from the experiment may identify appropriate utilization for other agricultural areas surrounding the smelter where forage metals loadings may be a potential hazard to grazers.

The experimental design includes excavation and capping treatments. The residential soils, once excavated, become a solid waste. Current disposal practices for solid wastes include landfilling. An alternative approach to disposal would be to view the excavated soils as a resource in remediating the East Field. Phytotoxicity is evident in East Field vegetation, whereas, East Helena residential yards are generally well kept, with yard vegetation rarely exhibiting the influence of metals toxicity. The excavated residential soils, while not suitable for a residential setting, could be used as a cap over portions of the East Field, enhancing field forage production while providing a barrier to phytotoxic soils below.

1.1 EVALUATION CRITERIA

Results from individual treatment plots will be compared against the following conservative guidelines:

A. Soil metal concentrations observed to be generally phytotoxic in the Helena Valley (U. S. EPA, 1987):

<u>TOTAL METALS</u>

Pb	1,000	mg/kg
As	100	mg/kg
Cd	100	mg/kg
Zn	500	mg/kg

B. Phytotoxic hazard concentrations (U. S. EPA, 1987) and National Research Council (NRC) forage metals concentrations chronically tolerated by domestic grazers.

Forage Phytotoxic Concentrations					NRC Livestock Forage Concentrations Chronically Tolerated		
Tolerable			Hazard				
Pb	25	mg/kg	---	mg/kg	Pb	30	mg/kg
As	3	mg/kg	20	mg/kg	As	50	mg/kg
Cd	10	mg/kg	50	mg/kg	Cd	0.5	mg/kg
Zn	50	mg/kg	500	mg/kg	Zn	500	mg/kg

2.0 METHODS AND MATERIALS

2.1 SITE DESCRIPTION

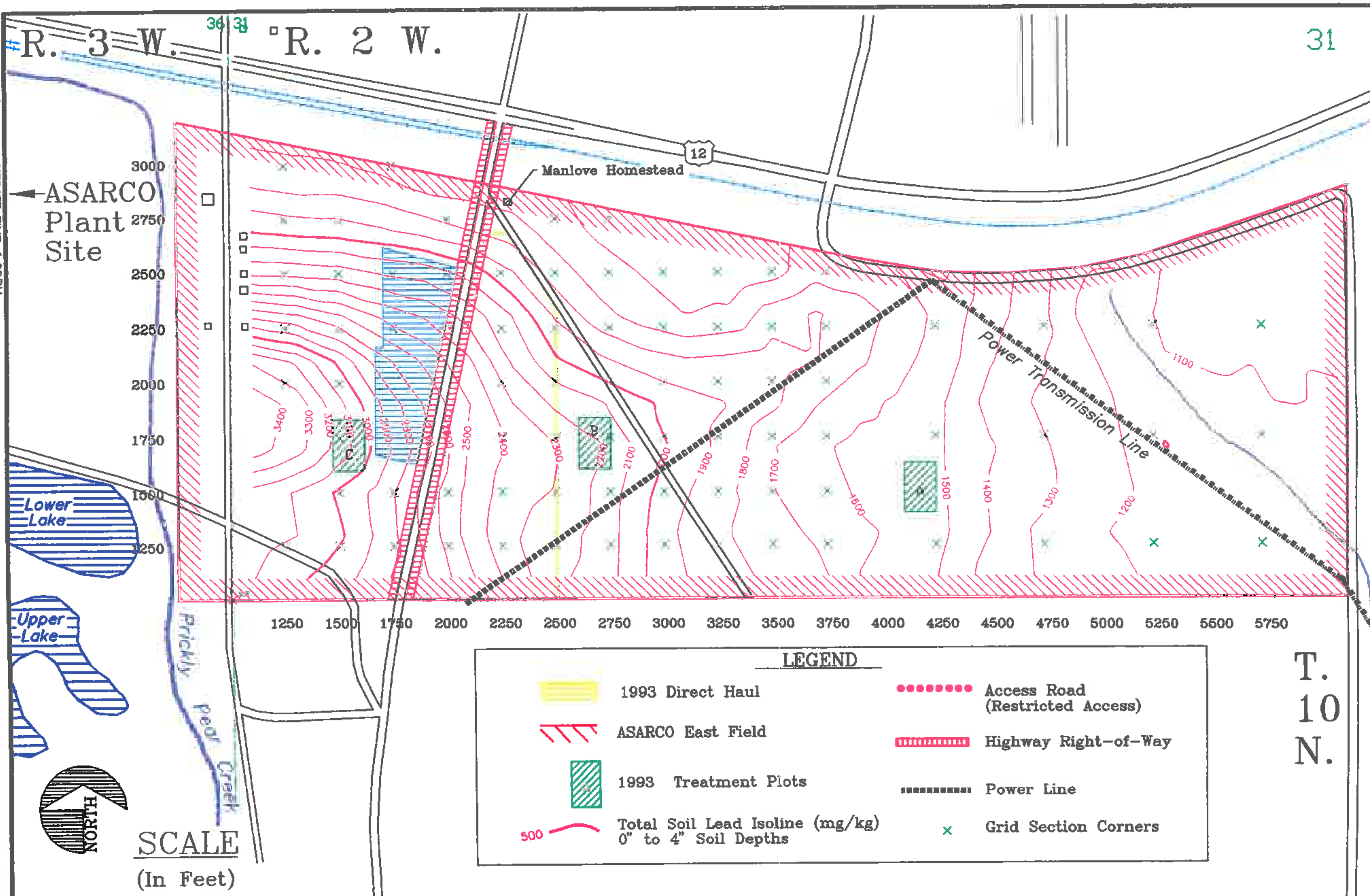
The field experiments were conducted at three locations in the East Field, which lies adjacent to the Asarco Smelter (Figure 2-1). Plot A is located in Amesha-Attewan loam soils while Plots B and Plot C are located in an Attewan-Nippt complex (USDA). The climate consists of cold winters, wet springs and warm summers with moderate thunderstorm activity. The Helena Valley floor is semiarid with total annual precipitation averaging less than 10 inches. Mean annual evaporation is approximately 36 to 38 inches (Hydrometrics, 1990).

2.2 SELECTION OF SITES

The three sites in the East Field (Plots A, B and C) were selected for field experiments based on their soil lead concentrations. The sites lie along a soil lead concentration gradient which runs from west to east in the field. Each plot location represents a distinctly different surface lead concentration as determined by analysis of variance (ANOVA) calculations in Section 3.1.

2.3 EXPERIMENTAL DESIGN AND STATISTICAL ANALYSIS

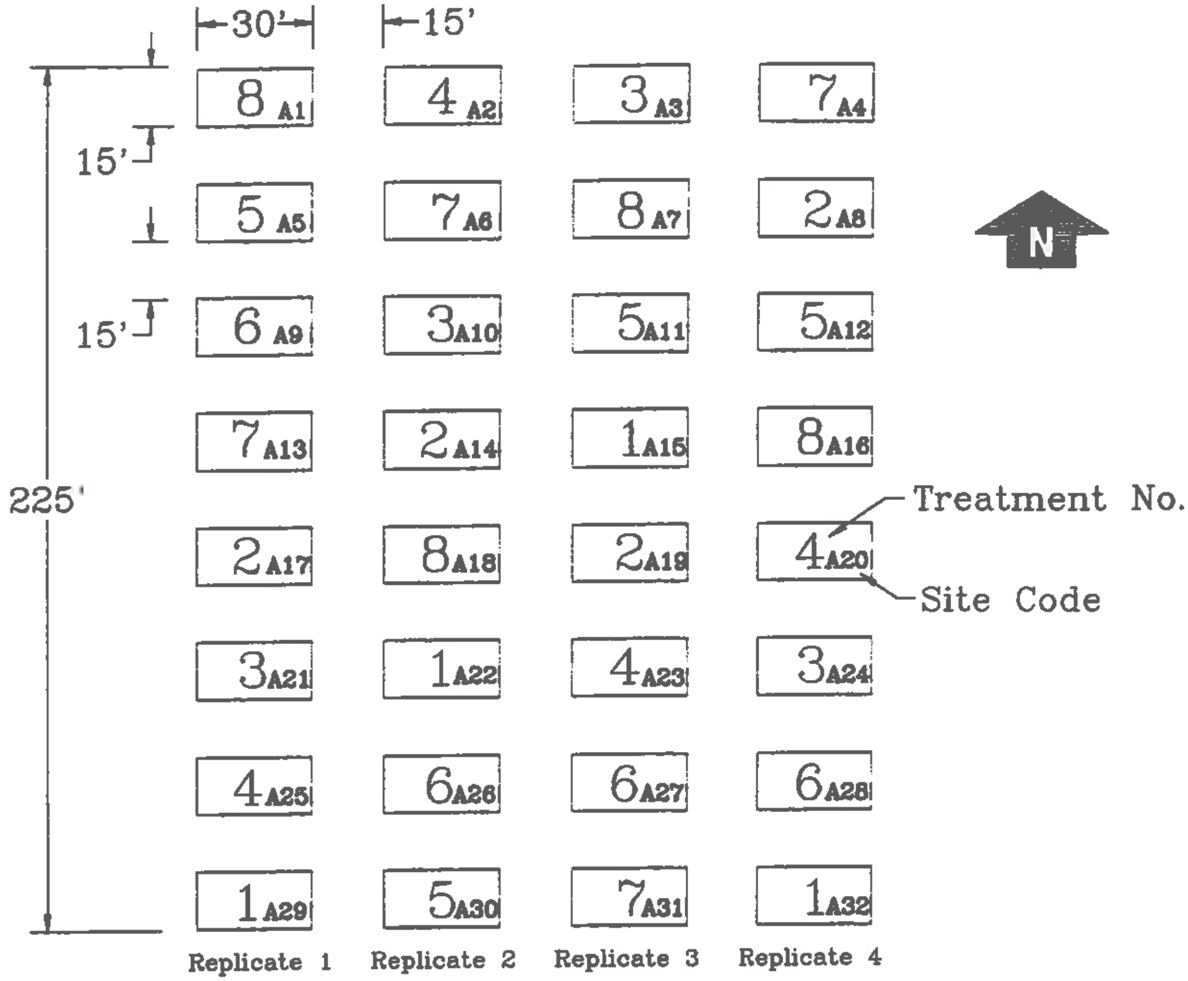
The field experiment was a randomized complete-block design replicated four times. The experiment was established at each of the three plot locations in the East Field. Substrate lead concentrations at the plots were identified as 1500 mg/kg, 2000 mg/kg and 3000 mg/kg, (Figures 2-2, 2-3, and 2-4) from kriged contour plots of total lead concentrations in the East Field. Data from the three sites were combined and subjected to analysis of variance using STATISTCA software (StatSoft, 1994). The model for the vegetation analyses was a three factor ANOVA: 3 (plot locations) by 8 (treatments) by 4 (replicates).



1994 TREATABILITY TEST PLOT RESULTS
ASARCO EAST FIELD

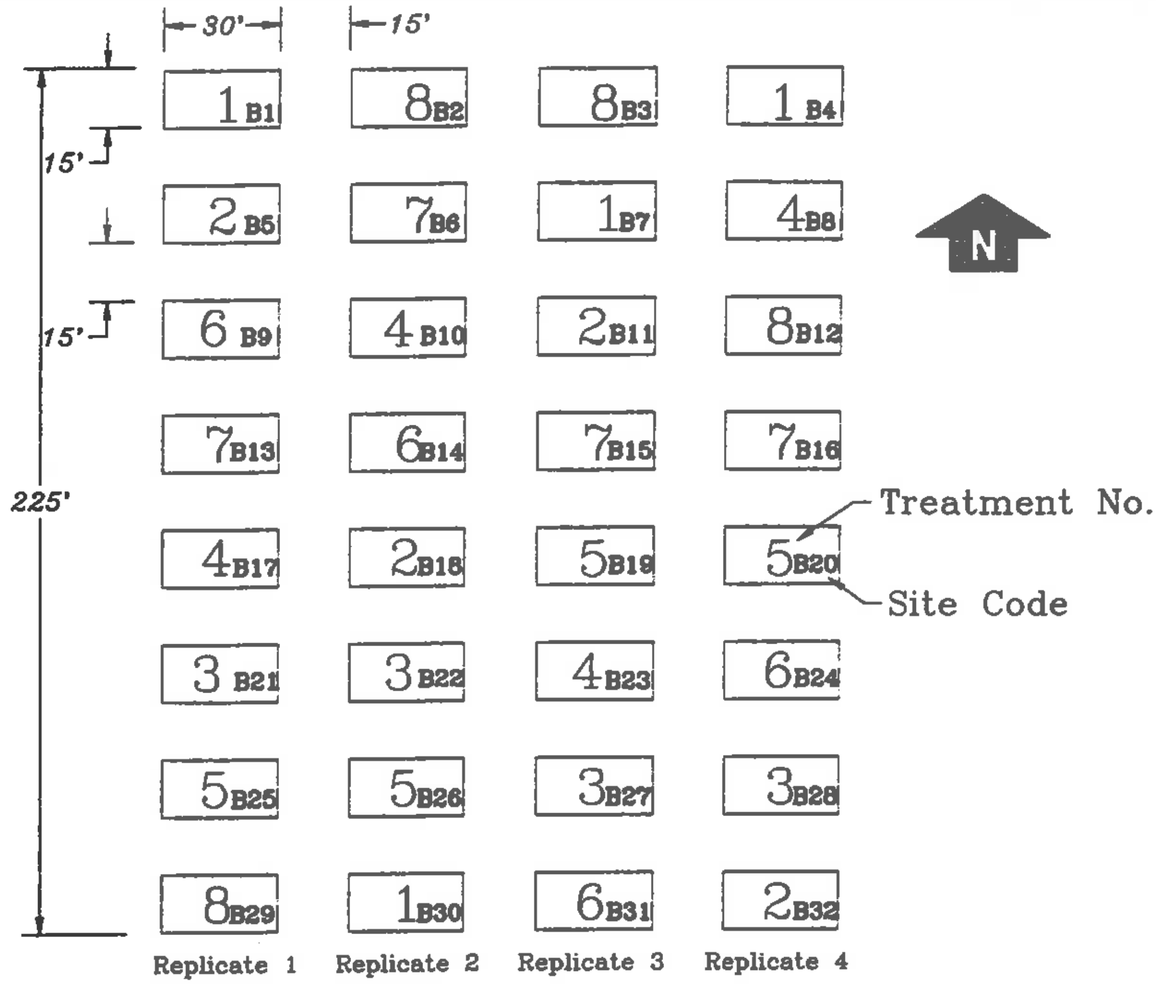
TREATMENT PLOT STUDY AREA

FIGURE 2-1



Treatment #	Description
1	Control, No Lime, No Cap
2	Lime, No Cap
3	Lime, 6" Residential Soil Cap
4	Lime, 12" Residential Soil Cap
5	4" Excavation, Lime, 4" Clean Cap
6	4" Excavation, Lime, No Cap
7	8" Excavation No Lime, No Cap
8	Moldboard Plow to 12"

1994 TREATABILITY TEST PLOT RESULTS ASARCO EAST FIELD	EAST FIELD TESTABILITY PLOT A RANDOMIZED BLOCK EXPERIMENTAL DESIGN 1500 mg/kg Pb	FIGURE 2-2



Treatment #	Description
1	Control, No Lime, No Cap
2	Lime, No Cap
3	Lime, 6" Residential Soil Cap
4	Lime, 12" Residential Soil Cap
5	4" Excavation, Lime, 4" Clean Cap
6	4" Excavation, Lime, No Cap
7	8" Excavation No Lime, No Cap
8	Moldboard Plow to 12"

1994 TREATABILITY TEST PLOT RESULTS
ASARCO EAST FIELD

EAST FIELD TREATABILITY PLOT B RANDOMIZED BLOCK EXPERIMENTAL DESIGN 2000 mg/kg Pb

FIGURE 2-3

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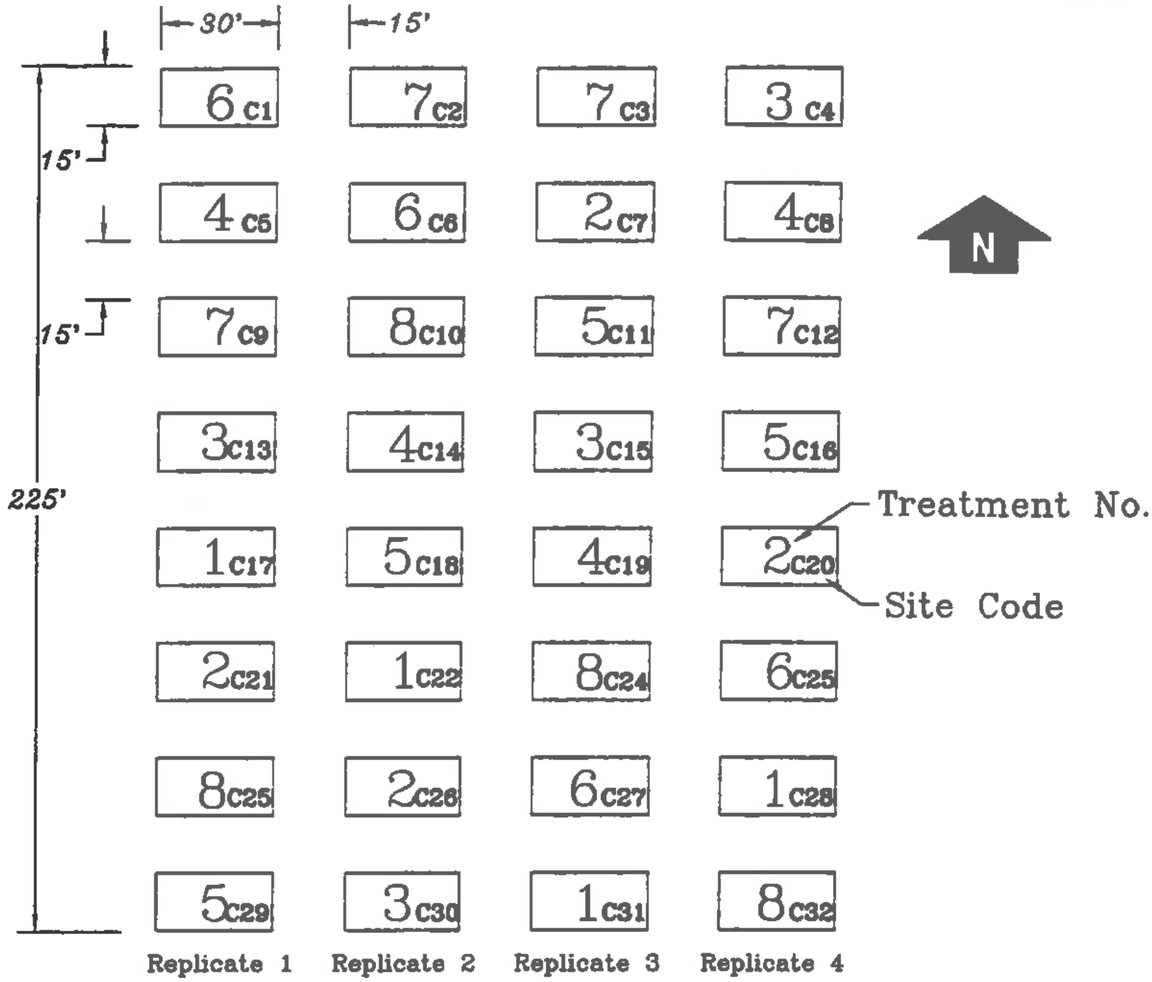
Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors



Treatment #	Description
1	Control, No Lime, No Cap
2	Lime, No Cap
3	Lime, 6" Residential Soil Cap
4	Lime, 12" Residential Soil Cap
5	4" Excavation, Lime, 4" Clean Cap
6	4" Excavation, Lime, No Cap
7	8" Excavation No Lime, No Cap
8	Moldboard Plow to 12"

1994 TREATABILITY TEST PLOT RESULTS
ASARCO EAST FIELD

EAST FIELD TREATABILITY PLOT C RANDOMIZED BLOCK EXPERIMENTAL DESIGN 3000 mb/kg Pb

FIGURE **2-4**

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Hydrometrics, Inc. Consulting Scientists, Engineers and Contractors

The eight treatments include the following:

Treatment # 1	Control, No lime, No Soil Cap
Treatment # 2	Lime + Tillage, No Soil Cap
Treatment # 3	Lime + Tillage + 6-inch Residential Soil Cap
Treatment # 4	Lime + Tillage + 12-inch Residential Soil Cap
Treatment # 5	4-inch Excavation + Lime + 4-inch Clean Soil Cap
Treatment # 6	4-inch Excavation + Lime, No Soil Cap
Treatment # 7	8-inch Excavation, No Lime, No Soil Cap
Treatment # 8	Moldboard Plow to 12-inches

There were fewer soil data points than vegetative data points. As a consequence of fewer data points, the soil data model was slightly different, being a two factor ANOVA including location and treatment.

Statistically significant F-tests ($P<0.05$) among location and treatment effects justified analysis within each factor. Means separation procedures calculating least significant differences (LSD) and Duncan's Multiple Range Test (DMRT) were used to compare mean effects within a factor. The LSD means separation test was used when comparing 4 or less means while DMRT was used when comparing 5 or more means (Gomez, 1984).

Each plot was laid out in a rectangular grid, consisting of blocks of eight randomized treatments, replicated four times. The individual treatment subplots measured 15 feet x 30 feet. Roadways and berms between each subplot effectively isolated treatments in each subplot. All subplots were fertilized and seeded on June 22, 1993.

Subplots were fertilized with 50 lbs/acre NO_3-N and 50 lbs/acre P_2O_5. Treatments that required an application of lime were limed with -60 mesh crushed limestone (4 tons/acre) with a calcium carbonate equivalent of at least 95 percent. Subplots were broadcast-seeded with the following mixture:

Common Name	Scientific Name	Seeding Rate
Smooth brome	*Bromus inermis*	4 lbs PLS*/acre
Sandberg bluegrass	*Poa sandbergii*	5 lbs PLS/acre
Crested wheatgrass	*Agropyron cristatum*	3 lbs PLS/acre
Western wheatgrass	*Agropyron smithii*	4 lbs PLS/acre
Pubescent wheatgrass	*Agropyron trichophorum*	5 lbs PLS/acre
Bluebunch wheatgrass	*Agropyron spicatum*	5 lbs PLS/acre
Streambank wheatgrass	*Agropyron riparium*	5 lbs PLS/acre

* Pure Live Seed

To ensure seed germination and stand establishments, supplemental irrigation was applied during the three week period following seeding.

2.4 SOIL SAMPLING AND ANALYSIS

Prior to the construction of the test plot treatments, soil samples (pre-treatment samples) were collected with a 2-inch diameter hand auger from the surface four inches at three locations within each subplot and composited for each treatment replicate. The samples were placed in one-gallon Ziploc bags and delivered to the Hydrometrics, Inc. East Helena laboratory for total arsenic, cadmium, lead, and zinc analysis using the Spectrace 5000 X-Ray Fluorescence (XRF) spectrophotometer (Appendix 1). The purpose of pre-sampling was to verify that each substrate plot contained the desired concentration of total soil lead and that the concentrations of arsenic and metals within each substrate plot was uniform. Pre-sampling analytical results will be compared against grass yield and metals loadings to see if significant correlations exist.

After construction of the treatment subplots, soil samples (post-treatment samples) were again collected with a 2-inch diameter hand auger from the surface four inches at three locations within each subplot and composited for each treatment replicate. Collected samples were analyzed for total soil arsenic, cadmium, lead and zinc using the XRF spectrophotometer. The purpose of post-treatment sampling was to determine changes in total arsenic and metals concentrations and soil chemistry in the surface of the plots resulting from the various treatments. The results of post-treatment sampling will also be compared against grass yield and metal loadings to see if significant correlations exist.

All pre-treatment and post-treatment soil samples were archived and may be analyzed for other parameters as necessary to evaluate soil and forage arsenic and metal relationships. All field and laboratory work performed in conjunction with the Treatability Test Plot Study was conducted in accordance with the Sampling and Analysis Plan (SAP) (Hydrometrics, 1991) for the excavation and removal of residential soils from East Helena and the Work Plan for the Focused Feasibility Study on the Location and Method of Disposal of East Helena Soils (Hydrometrics, 1992a). Additionally, all field and laboratory work performed in conjunction with the test plots was conducted in accordance with the Site Health and Safety Plan (Hydrometrics, 1992b) for excavation and removal of East Helena residential soils.

2.5 VEGETATION SAMPLING AND ANALYSIS

In 1994, treatment plot vegetation analyses consisted of estimating aerial plant cover and determining perennial grass above-ground biomass production (pounds per acre). Cover and production values were derived by using a modification of the Daubenmire technique (Daubenmire, 1959). Cover was estimated in four frames (20 x 50 cm.), randomly selected along the north side of a diagonal transect in each plot, while the four production frames were located along the south side of the same transect. Replicate treatment plot cover and production values were then averaged per each of the eight treatments. Based on cover and production values, dominant perennial grass species were chosen from each of the replicate treatment plots for arsenic and metal loading analyses.

Once cover and production values were determined, Vegetation Importance Values were calculated (Table 2-1). These values incorporated species-specific cover and production data to objectively identify superior plant performance. Relative cover values were derived by

TABLE 2-1. VEGETATION IMPORTANCE VALUES, EAST FIELD TREATABILITY PLOTS

PLOT A		PLOT B		PLOT C	
POSA	8015	POSA	6048	BRIN	3988
BRIN	3779	BRIN	3640	AGSP	3603
AGCR	3205	AGRI	3228	AGCR	3291
AGTR	2404	AGSM	2005	AGSM	2822
AGSP	2086	AGCR	2004	POSA	2359
AGRE	1909	AGTR	1590	AGRE	2192
AGRI	1800	AGSP	1285	AGRI	2167
AGSM	1298	AGRE	1064	AGTR	1785
POPR	652	HOJU	14	HOJU	921
HOJU	178	POPR	11	STCO	588
				ELCA	202
				POPR	57

IMPORTANCE VALUE TOTALS:
PLOTS A, B, C

* POSA	16421
* BRIN	11407
* AGCR	8500
AGRI	7195
* AGSP	6975
AGSM	6125
AGTR	5780
AGRE	5165
POPR	719
STCO	588
ELCA	202

GRASS SPECIES LIST

AGCR	*Agropyron cristatum,*(Crested wheatgrass)
AGRE	*A. Repens,* (Quackgrass)
AGRI	*A. Riparium,* (Streambank wheatgrass)
AGSM	*A. Smithii,* (Western wheatgrass)
AGSP	*A. spicatum,* (Bluebunch wheatgrass)
AGTR	*A. Trichophorum,* (Pubescent wheatgrass)
BRIN	*Bromus inermis,* (Smooth brome)
ELCA	*Elymus canadensis,* (Canada wildrye)
HOJU	*Hordeum jubatum,* (Foxtail barley)
POPR	*Poa pratensis,* (Kentucky bluegrass)
POSA	*Poa sandbergii,* (Sandberg bluegrass)
STCO	*Stipa comata,* (Needle and thread grass)

* Grass species shipped to Asarco Technical Services Center Laboratory in Salt Lake City, Utah, for metal uptake analysis.

dividing individual plant cover values by the sum of the cover for all species and then multiplying the quotient by 100. Relative production was derived using a similar expression utilizing production values. The Vegetation Importance Value for each species was then determined as the sum of the relative cover and relative production values. Vegetation Importance Values designated which perennial grass species were to be sent to Asarco's Technical Services Center laboratory in Salt Lake City, Utah for arsenic and metal loading analyses. Treatability plot vegetation sampling was performed in accordance with the Vegetation Work Plan for the Focused Feasibility Study on the Location and Method of Disposal of East Helena Soils (Hydrometrics, 1994). All vegetation aerial cover and production data is in Appendix 2.

The perennial grass species that were evaluated for arsenic and metal loadings were selected based on their Vegetation Importance Values. Crested wheatgrass, bluebunch wheatgrass, smooth brome and Sandberg bluegrass were the species selected for arsenic and metal loading analyses. Bluebunch wheatgrass, the fifth dominant plant, was selected over streambank wheatgrass (4th) (Table 2-2), based on its wildlife forage value instead of its importance value.

Streambank wheatgrass will be selected for arsenic and metal loadings analyses in the third growing season. All perennial grass species were clipped during the production study work. The samples were clipped at two inches above the ground, packaged, refrigerated and shipped in ice chests to the Asarco Technical Services Center laboratory in Salt Lake City, Utah for total plant tissue arsenic, cadmium, lead and zinc. No attempt was made to determine plant surface concentrations of arsenic and metals. The vegetation sample collection and analysis matrix is presented in Table 2-2. The results of arsenic and metal loadings in and on vegetation from each replicated plot are in the East Field Treatability Plot Data Validation Report in Appendix 3.

Treatment 7 (Excavate 8")

Germination was good. Due to standing water, low organic matter, and the presence of natural carbonates, plants appeared nutrient deficient, were less vigorous and had spindly leaves.

Treatment 8 (Moldboard Plow to 12")

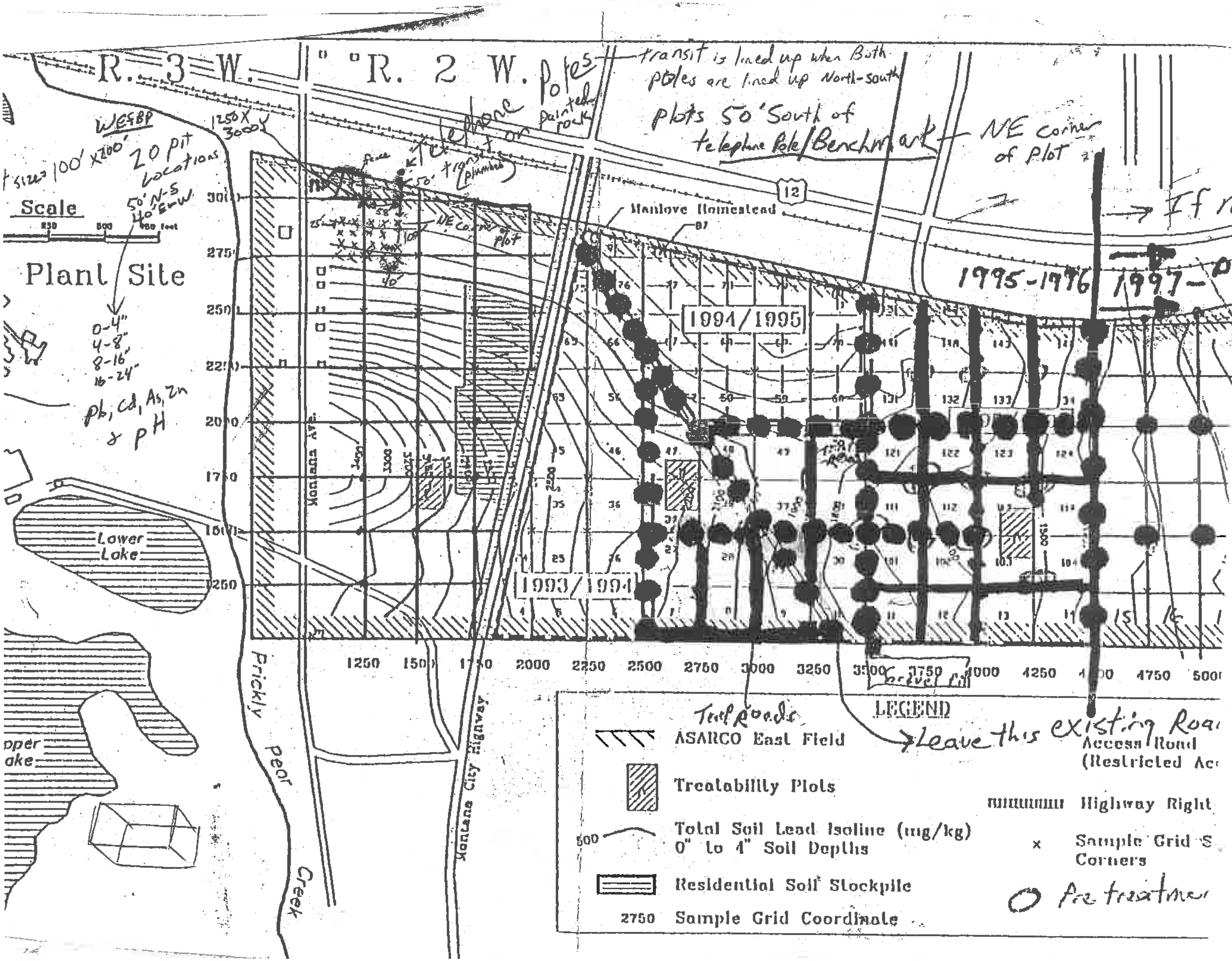
Establishment was poor and there were more weeds. Overall, vegetation was less dense than that observed in Control plots.

A photo log of the treatments in Plot B is found in Figures 4-1 through Figure 4-8.

4.6 FORAGE METAL EFFECTS ON ANIMALS

East Field forage concentrations of arsenic and zinc, irregardless of treatment, are well below concentrations chronically tolerated by livestock. East Field forage concentrations of lead and cadmium, irregardless of treatment, are greater than National Research Council recommended concentrations that protect sensitive species. These forage concentrations of lead and cadmium, however, are less than concentrations required to elicit toxic responses in more tolerant species under a variety of management considerations (Hydrometrics, 1993).

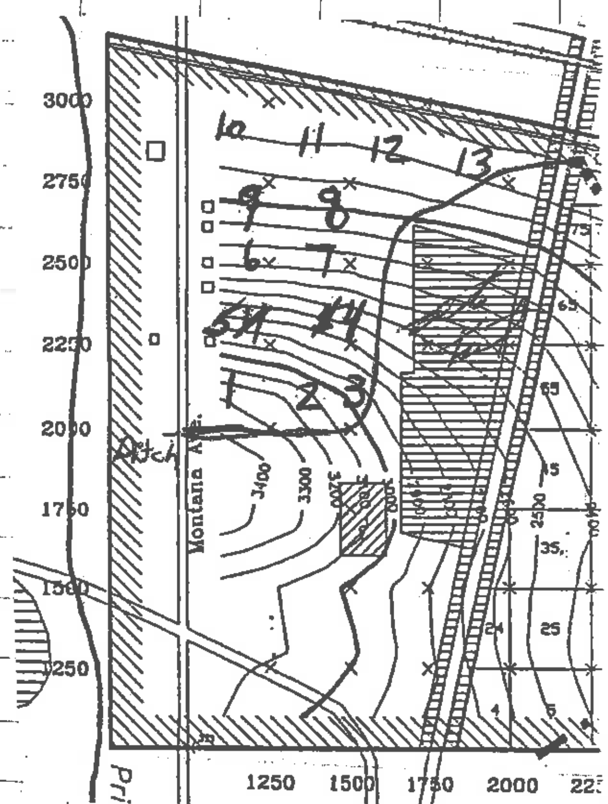
The potential exists for animals to have increased body burdens of metals (bioaccumulation) from forage ingestion, with the possible elimination of sensitive individuals. Forage metals have the potential to bioaccumulate in individual animals, although potential to biomagnify up the food chain is negligible (Hydrometrics, 1993).



R. 3 W.
R. 2 W.
Telephone Poles or painted rock
transit is lined up when Both poles are lined up North-south
plots 50' South of telephone Pole/Benchmark
NE corner of plot
If n
WESBP
t sizes 100' x 200'
20 pit locations
50' N-S
40' E-W
1250 X 3000
Scale
Plant Site
0-4"
4-8"
8-16"
16-24"
Pb, Cd, As, Zn & pH
fence
50' transit (plumbed)
NE corner of plot
12
Hanlove Homestead
1994/1995
1995-1996
1997-
1993/1994
Lower Lake
pper ake
Prickly Pear Creek
Montana Ave.
Montana City Highway
1250
1500
1750
2000
2250
2500
2750
3000
3250
3500
3750
4000
4250
4500
4750
5000
3000
2750
2500
2250
2000
1750
1500
1250
gravel pit
Test Roads
Leave this existing Road
LEGEND
ASARCO East Field
Treatability Plots
Total Soil Lead Isoline (mg/kg) 0" to 4" Soil Depths
Residential Soil Stockpile
2750 Sample Grid Coordinate
Access Road (Restricted Ac
Highway Right
Sample Grid S Corners
Pre treatmen

Site Sector	Code #	Depth inches	Date Time	
WFDH		7/16/96		
FDH-1P	WFDH-9607-100	0-15"	1400	
}	}	} -101	15-30"	1410
FDH-2P	WFDH-9607-102	0-15"	1445	
}	WFDH-9607-103	15-30"	1500	
FDH-3P	WFDH-9607-104	0-15" ~~15-30"~~	1510	
}	WFDH 9607-105	15-30"	1515	
FDH-4P	WFDH 9607-106	0-15"	1530	
DH-4P	WFDH 9607-107	15-30"	1540	
FDH5P	WFDH 9607-108	0-15"	1550	
}	}	} 109		1600
DH6P	WFDH-9607-110	0-15"	1615	>26"
}	WFDH-9607-111	15-30"	1625	

11



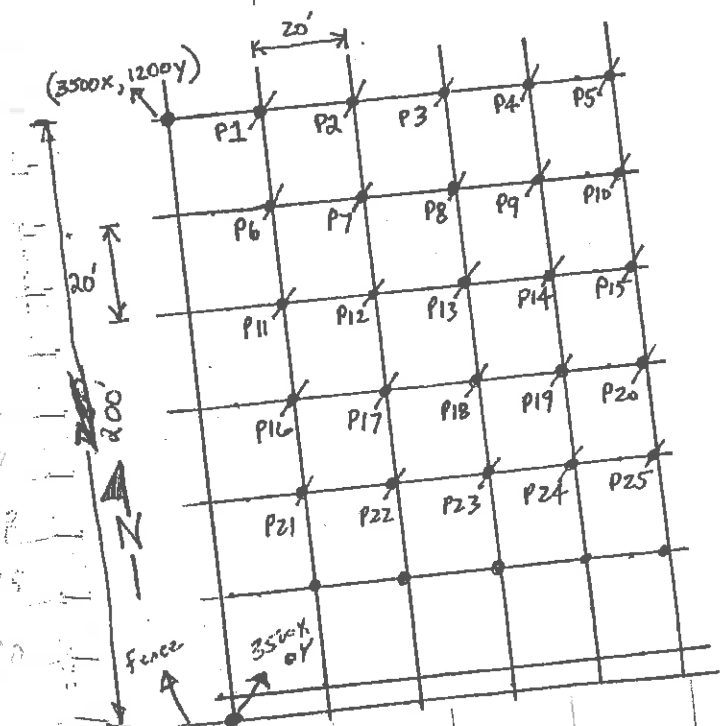
12

SITE/AREA SECTOR	SAMPLE #	DEPTH INCHES	DATE TIME	TAG #
			8/2/95	
EFBSFPL-B				
EFBF23-1	EFB-1508-368	0-4	1405	9567
-2	-369	4-8	1410	[illegible]
-3	-370	8-16	1415	[illegible]
-4	-371	16-24	1420	9570
EFBF24-1	EFB-1508-372	0-4	1425	9571
2	-373	4-8	1430	9572
3	-374	8-16	1435	[illegible]
-4	-375	16-24	1440	[illegible]
EFBF25-1	EFB-1508-376	0-4	1445	9575
-2	-377	4-8	1450	9576
-3	-378	8-16	1455	9577
-RB	378RB	(rinsate blank)	1500	9578
-4	-379	16-24	1505	9579
-5D	-379D (dupe)		1510	9580

End Sampling Session
ALS

(43)

E.F. BAKER PLOW DEMONSTRATION
SOIL SAMPLE



(44)

ite	code #	depth inches	date time	EPA Tag #
			10-7-93	
B	EHDH-9310-125	0-12	1345	
C	-126		1400	
/126)	-154	(dup/126)	1405	
B	EHDH-9310-155	0-12	0830 ~~10-8-93~~ ~~0830~~	
C	EHDH-9310-156	0-12	0845	

Direct Haul

- this page on.

all soil work is complete on Treatability Plots

5/14/94

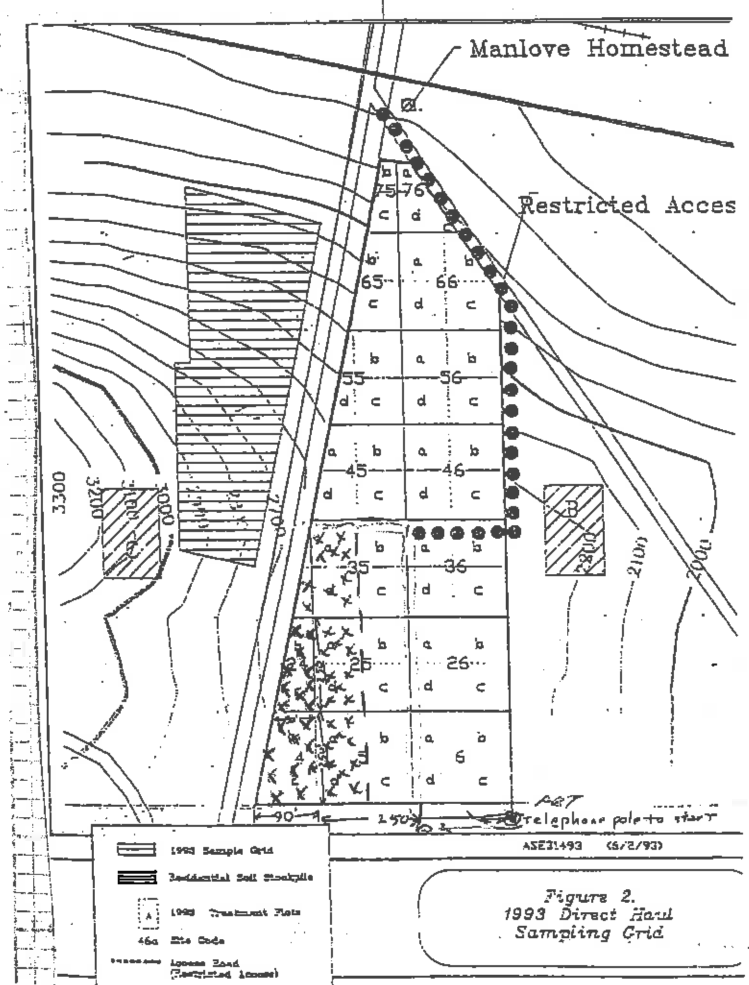


Figure 2.
1993 Direct Haul
Sampling Grid

62

ASARCO EAST HELENA
Residential Soils
Pre and Post Removal Report

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
				Post-Removal Samples				
04B	0-12	10/7/1993	EHDH-9310-125	93X-02309	680	81	14	745
04C	0-12	10/7/1993	EHDH-9310-126	93X-02310	711	76	13	776
04CR	0-12	10/7/1993	EHDH-9310-154	93X-02311	680	61	14	745
05A	0-12	12/15/1993	EHDH-9312-158	93X-02901	1083	99	19	1146
05A	0-12	10/14/1993	EHDH-9310-133	93X-02393	1137	100	18	1203
05AR	0-12	12/15/1993	EHDH-9312-160	93X-02903	1279	114	18	1342
05B	0-12	12/16/1993	EHDH-9312-161	93X-02904	1303	125	23	1367
05B	0-12	1/26/1994	EHDH-9401-169	94X-00013	1183	94	19	1246
05BR	0-12	1/26/1994	EHDH-9401-170	94X-00014	1128	81	20	1191
05C	0-12	12/16/1993	EHDH-9312-162	93X-02905	982	99	18	1044
05CR	0-12	12/16/1993	EHDH-9312-163	93X-02906	1085	91	16	1148
05D	0-12	12/15/1993	EHDH-9312-159	93X-02902	1001	108	14	1063
05D	0-12	10/14/1993	EHDH-9310-136	93X-02394	1168	99	21	1234
05DR	0-12	10/14/1993	EHDH-9310-157	93X-02395	1376	134	21	1443

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
06A	0-12	7/12/1994	EHDH-9407-218	94X-03973	680	78	13	742
06B	0-12	7/12/1994	EHDH-9407-219	94X-03974	698	68	13	760
06C	0-12	7/12/1994	EHDH-9407-220	94X-03975	511	58	9	573
06CR	0-12	7/12/1994	EHDH-9407-222	94X-03977	518	68	<5	580
06D	0-12	7/12/1994	EHDH-9407-221	94X-03976	1289	131	19	1353
07B	0-12	8/8/1995	EFDH-9508-381	95X-09098	962	95	25	1021
07C	0-12	8/8/1995	EFDH-9508-382	95X-09099	1065	90	18	1124
08A	0-12	8/8/1995	EFDH-9508-377	95X-09094	967	76	20	1026
08B	0-12	8/8/1995	EFDH-9508-378	95X-09095	854	68	19	913
08C	0-12	8/8/1995	EFDH-9508-379	95X-09096	817	70	16	875
08D	0-12	8/8/1995	EFDH-9508-380	95X-09097	806	77	17	864
09A	0-12	8/8/1995	EFDH-9508-372	95X-09089	955	75	19	1014
09B	0-12	8/8/1995	EFDH-9508-373	95X-09090	641	73	13	699
09C	0-12	8/8/1995	EFDH-9508-374	95X-09091	856	77	21	915
09D	0-12	8/8/1995	EFDH-9508-375	95X-09092	926	93	19	985
09DR	0-12	8/8/1995	EFDH-9508-376	95X-09093	886	70	14	945
10A	0-12	10/2/1995	EFDH-9510-421	95X-12516	622	83	11	680
10B	0-12	10/2/1995	EFDH-9510-422	95X-12517	814	88	17	872
10C	0-12	10/2/1995	EFDH-9510-423	95X-12518	908	92	16	967
10D	0-12	10/2/1995	EFDH-9510-424	95X-12519	924	101	21	983

Site Code - EFDH
East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
131A	0-12	7/31/1996	EFDH-9607-456	96X-06007	695	103	12	753
131B	0-12	7/31/1996	EFDH-9607-457	96X-06008	379	58	8	437
131C	0-12	7/31/1996	EFDH-9607-458	96X-06009	609	103	14	667
131D	0-12	7/31/1996	EFDH-9607-459	96X-06010	483	78	12	541
24B	0-12	10/8/1993	EHDH-9310-155	93X-02307	352	49	5	417
24B	0-12	8/17/1993	EHDH-9308-150	93X-01623	1329	125	22	1396
24C	0-12	8/17/1993	EHDH-9308-151	93X-01624	1472	144	27	1540
24C	0-12	10/8/1993	EHDH-9310-156	93X-02308	527	79	6	592
24CR	0-12	8/17/1993	EHDH-9308-152	93X-01625	1400	127	24	1468
25A	0-12	8/18/1993	EHDH-9308-101	93X-01649	1089	117	17	1155
25A	0-12	10/14/1993	EHDH-9310-101	93X-02391	546	66	12	611
25B	0-12	8/18/1993	EHDH-9308-102	93X-01650	1295	110	24	1362
25B	0-12	12/16/1993	EHDH-9312-164	93X-02907	1227	109	16	1290
25B	0-12	2/15/1994	EHDH-9402-173	94X-00081	1171	113	20	1234
25C	0-12	12/16/1993	EHDH-9312-165	93X-02908	1161	99	18	1224
25C	0-12	8/18/1993	EHDH-9308-103	93X-01651	1483	131	26	1551
25C	0-12	2/15/1994	EHDH-9402-171	94X-00079	1318	110	27	1382
25CR	0-12	2/15/1994	EHDH-9402-172	94X-00080	1227	106	26	1290
25D	0-12	8/18/1993	EHDH-9308-104	93X-01652	1690	137	27	1760
25D	0-12	10/14/1993	EHDH-9310-104	93X-02392	835	71	12	900

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
26A	0-12	8/2/1994	EHDH-9408-223	94X-04750	604	49	11	666
26AR	0-12	8/2/1994	EHDH-9408-227	94X-04754	593	58	12	655
26B	0-12	8/2/1994	EHDH-9408-224	94X-04751	967	64	14	1029
26C	0-12	8/2/1994	EHDH-9408-225	94X-04752	968	76	23	1030
26D	0-12	8/2/1994	EHDH-9408-226	94X-04753	778	64	16	840
2750X-2	0-4	9/23/1994	EHDH-9409-265	94X-07133	1332	178	28	1396
2750X-2	0-4	9/23/1994	EHDH-9409-267	94X-07135	1401	192	29	1465
2750X-2	0-4	9/23/1994	EHDH-9409-266	94X-07134	1363	173	20	1427
27A	0-12	10/2/1995	EFDH-9510-407	95X-12502	1134	104	24	1193
27B	0-12	10/2/1995	EFDH-9510-408	95X-12503	847	88	24	905
27C	0-12	10/2/1995	EFDH-9510-409	95X-12504	851	92	14	910
27D	0-12	10/2/1995	EFDH-9510-410	95X-12505	1202	122	26	1262
27DR	0-12	10/2/1995	EFDH-9510-411	95X-12506	1202	113	29	1262
28A	0-12	10/2/1995	EFDH-9510-412	95X-12507	953	87	20	1012
28B	0-12	8/8/1995	EFDH-9508-386	95X-09102	1045	96	24	1104
28C	0-12	8/8/1995	EFDH-9508-387	95X-09103	959	94	22	1018
28D	0-12	10/2/1995	EFDH-9510-413	95X-12508	953	89	19	1012
29A	0-12	8/8/1995	EFDH-9508-383	95X-09100	1102	92	21	1161
29B	0-12	10/2/1995	EFDH-9510-425	95X-12520	765	87	18	823
29C	0-12	8/8/1995	EFDH-9508-389	95X-09104	795	62	21	853

Site Code - EFDH
East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
29DA	0-12	8/8/1995	EFDH-9508-384	95X-09101	749	87	15	807
3000X-2	0-4	9/14/1994	EHDH-9409-261	94X-06612	365	76	30	427
3000X-2	0-4	9/14/1994	EHDH-9409-262	94X-06613	1534	210	11	1599
3000X-2	0-4	9/14/1994	EHDH-9409-264	94X-06615	1037	143	26	1099
3000X-2	0-4	9/14/1994	EHDH-9409-263	94X-06614	1121	184	24	1184
30A	0-12	10/2/1995	EFDH-9510-426	95X-12521	757	90	16	815
30B	0-12	10/2/1995	EFDH-9510-427	95X-12522	874	111	16	933
30C	0-12	10/2/1995	EFDH-9510-428	95X-12523	954	101	19	1013
30D	0-12	10/2/1995	EFDH-9510-429	95X-12524	1031	103	22	1090
30DR	0-12	10/2/1995	EFDH-9510-434	95X-12529	762	84	16	820
3250X-2	0-4	9/14/1994	EHDH-9409-258	94X-06609	2224	278	32	2296
3250X-2	0-4	9/28/1994	EHDH-9409-269	94X-07166	2020	301	34	2090
3250X-2	0-4	9/28/1994	EHDH-9409-270	94X-07167	714	144	34	776
3250X-2	0-4	9/23/1994	EHDH-9409-268	94X-07136	1116	58	43	1179
3250X-2	0-4	9/14/1994	EHDH-9409-259	94X-06610	1221	186	24	1284
3250X-2	0-4	9/14/1994	EHDH-9409-260	94X-06611	432	112	31	494
3500X-2	0-4	9/14/1994	EHDH-9409-256	94X-06607	811	142	29	873
3500X-2	0-4	9/14/1994	EHDH-9409-257	94X-06608	613	140	14	675
35A	0-12	10/14/1993	EHDH-9310-109	93X-02389	785	97	20	850
35A	0-12	8/18/1993	EHDH-9308-153	93X-01653	1968	190	35	2040

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
35A	0-12	8/18/1993	EHDH-9308-109	93X-01654	1972	178	38	2044
35B	0-12	12/20/1992	EHDH-9312-166	93X-02917	1073	101	17	1135
35B	0-12	8/18/1993	EHDH-9308-110	93X-01655	1428	161	22	1496
35C	0-12	8/18/1993	EHDH-9308-111	93X-01656	1126	92	20	1192
35C	0-12	2/15/1994	EHDH-9402-174	94X-00082	1156	108	22	1219
35C	0-12	12/17/1993	EHDH-9312-168	93X-02910	1249	114	23	1312
35C	0-12	12/17/1993	EHDH-9312-167	93X-02909	1150	79	20	1213
35D	0-12	10/14/1993	EHDH-9310-112	93X-02390	683	86	11	748
35D	0-12	8/18/1993	EHDH-9308-112	93X-01657	1086	114	20	1152
36A	0-12	8/3/1994	EHDH-9408-228	94X-04766	568	43	14	630
36B	0-12	8/3/1994	EHDH-9408-229	94X-04767	568	58	12	630
36C	0-12	8/3/1994	EHDH-9408-230	94X-04768	701	60	16	763
36D	0-12	8/3/1994	EHDH-9408-231	94X-04769	603	39	16	665
37C	0-12	10/2/1995	EFDH-9510-414	95X-12509	903	86	20	962
37D	0-12	10/2/1995	EFDH-9510-415	95X-12510	933	96	21	992
38A	0-12	10/2/1995	EFDH-9510-416	95X-12511	530	69	13	588
38B	0-12	10/2/1995	EFDH-9510-417	95X-12512	772	86	17	830
38C	0-12	10/2/1995	EFDH-9510-418	95X-12513	611	64	14	669
38D	0-12	10/2/1995	EFDH-9510-419	95X-12514	864	115	19	923
39A	0-12	10/2/1995	EFDH-9510-430	95X-12525	1075	105	18	1134

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
39B	0-12	10/2/1995	EFDH-9510-431	95X-12526	1037	106	15	1096
39C	0-12	10/2/1995	EFDH-9510-432	95X-12527	867	96	17	926
39D	0-12	10/2/1995	EFDH-9510-433	95X-12528	684	78	19	742
40A	0-12	10/3/1995	EFDH-9510-435	95X-12530	906	94	19	965
40B	0-12	10/3/1995	EFDH-9510-436	95X-12531	801	80	16	859
40C	0-12	10/3/1995	EFDH-9510-437	95X-12532	541	81	8	599
40D	0-12	10/3/1995	EFDH-9510-438	95X-12533	856	80	17	915
45A	0-12	6/23/1994	EHDH-9406-201	94X-03305	537	57	16	599
45AR	0-12	6/23/1994	EHDH-9406-202	94X-03306	495	53	10	557
45B	0-12	6/23/1994	EHDH-9406-203	94X-03307	447	65	11	509
45C	0-12	6/23/1994	EHDH-9406-204	94X-03308	508	69	15	570
45D	0-12	6/21/1994	EHDH-9406-200	94X-03022	423	59	8	485
46A	0-12	6/23/1994	EHDH-9406-213	94X-03317	550	57	8	612
46B	0-12	6/23/1994	EHDH-9406-214	94X-03318	687	82	14	749
46C	0-12	6/23/1994	EHDH-9406-215	94X-03319	589	50	12	651
46D	0-12	6/23/1994	EHDH-9406-216	94X-03320	625	57	13	687
46DR	0-12	6/23/1994	EHDH-9406-217	94X-03321	608	60	14	670
47A	0-12	5/24/1995	EFDH-9505-367	95X-04636	1093	93	18	1152
47B	0-12	5/24/1995	EFDH-9505-368	95X-04637	982	89	15	1041
48A	0-12	10/3/1995	EFDH-9510-447	95X-12542	568	62	13	626

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
48B	0-12	10/3/1995	EFDH-9510-448	95X-12543	1072	109	20	1131
48C	0-12	10/3/1995	EFDH-9510-449	95X-12544	957	80	14	1016
48CR	0-12	10/3/1995	EFDH-9510-450	95X-12545	911	96	20	970
48D	0-12	10/2/1995	EFDH-9510-420	95X-12515	934	98	19	993
49A	0-12	10/3/1995	EFDH-9510-443	95X-12538	887	91	18	946
49B	0-12	10/3/1995	EFDH-9510-444	95X-12539	967	100	18	1026
49C	0-12	10/3/1995	EFDH-9510-445	95X-12540	1078	114	15	1137
49D	0-12	10/3/1995	EFDH-9510-446	95X-12541	923	106	17	982
50A	0-12	10/3/1995	EFDH-9510-439	95X-12534	827	94	15	885
50B	0-12	10/3/1995	EFDH-9510-440	95X-12535	740	97	12	798
50C	0-12	10/3/1995	EFDH-9510-441	95X-12536	740	86	16	798
50D	0-12	10/3/1995	EFDH-9510-442	95X-12537	1266	130	20	1326
55A	0-12	6/23/1994	EHDH-9406-205	94X-03309	401	58	8	463
55B	0-12	6/23/1994	EHDH-9406-206	94X-03310	458	78	10	520
55C	0-12	6/23/1994	EHDH-9406-207	94X-03311	431	59	13	493
55D	0-12	6/23/1994	EHDH-9406-208	94X-03312	373	57	8	435
56A	0-12	6/23/1994	EHDH-9406-209	94X-03313	666	71	14	728
56B	0-12	6/23/1994	EHDH-9406-210	94X-03314	670	93	15	732
56C	0-12	6/23/1994	EHDH-9406-211	94X-03315	494	67	13	556
56D	0-12	6/23/1994	EHDH-9406-212	94X-03316	667	62	16	729

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
57A	0-12	5/24/1995	EFDH-9505-365	95X-04634	1064	106	20	1123
57A	0-12	6/29/1995	EFDH-9506-369	95X-06884	1093	90	25	1152
57AR	0-12	6/29/1995	EFDH-9506-371	95X-06886	1077	85	24	1136
57B	0-12	5/2/1995	EFDH-9505-355	95X-01939	1461	145	28	1522
57B	0-12	5/4/1995	EFDH-9505-357	95X-02594	1083	139	20	1142
57C	0-12	5/4/1995	EFDH-9505-358	95X-02595	1274	154	23	1334
57C	0-12	5/2/1995	EFDH-9505-356	95X-01940	1114	143	18	1173
57D	0-12	6/29/1995	EFDH-9506-370	95X-06885	850	78	18	909
57D	0-12	5/24/1995	EFDH-9505-366	95X-04635	1353	94	21	1414
58A	0-12	5/2/1995	EFDH-9505-342	95X-01926	988	120	15	1047
58AR	0-12	5/2/1995	EFDH-9505-346	95X-01930	1025	130	15	1084
58B	0-12	5/2/1995	EFDH-9505-343	95X-01927	1087	173	16	1146
58C	0-12	5/2/1995	EFDH-9505-344	95X-01928	1069	146	23	1128
58D	0-12	5/2/1995	EFDH-9505-345	95X-01929	923	115	13	982
59A	0-12	3/31/1995	EFDH-9503-327	95X-00406	785	117	17	843
59B	0-12	3/31/1995	EFDH-9503-319	95X-00407	733	109	15	791
59C	0-12	3/31/1995	EFDH-9503-320	95X-00408	861	102	13	920
59D	0-12	3/31/1995	EFDH-9503-321	95X-00409	1113	175	22	1172
59DR	0-12	3/31/1995	EFDH-9503-322	95X-00410	1101	160	16	1160
60A	0-12	12/1/1994	EHDH-9412-283	94X-09975	1045	116	15	1107

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
60B	0-12	12/1/1994	EHDH-9412-284	94X-09976	904	86	13	966
60C	0-12	12/1/1994	EHDH-9412-280	94X-09972	822	103	13	884
60CR	0-12	12/1/1994	EHDH-9412-281	94X-09973	763	105	17	825
60D	0-12	12/1/1994	EHDH-9412-282	94X-09974	779	89	11	841
65B	0-12	8/26/1994	EHDH-9408-243	94X-05326	911	99	19	973
65C	0-12	8/26/1994	EHDH-9408-244	94X-05327	820	82	14	882
66A	0-12	8/26/1994	EHDH-9408-245	94X-05328	722	98	13	784
66B	0-12	8/26/1994	EHDH-9408-246	94X-05329	1293	82	18	1357
66C	0-12	8/26/1994	EHDH-9408-247	94X-05330	1142	101	17	1205
66D	0-12	8/26/1994	EHDH-9408-248	94X-05331	1122	119	19	1185
67A	0-12	5/2/1995	EFDH-9505-351	95X-01935	979	115	18	1038
67B	0-12	5/2/1995	EFDH-9505-352	95X-01936	726	112	11	784
67C	0-12	5/2/1995	EFDH-9505-353	95X-01937	1140	132	18	1199
67D	0-12	5/2/1995	EFDH-9505-354	95X-01938	1049	137	17	1108
68A	0-12	5/2/1995	EFDH-9505-347	95X-01931	902	125	13	961
68A	0-12	5/4/1995	EFDH-9505-359	95X-02596	927	126	13	986
68B	0-12	5/2/1995	EFDH-9505-348	95X-01932	1251	163	20	1311
68B	0-12	5/4/1995	EFDH-9505-360	95X-02597	1007	141	24	1066
68C	0-12	5/2/1995	EFDH-9505-349	95X-01933	1137	130	19	1196
68C	0-12	5/4/1995	EFDH-9505-361	95X-02598	1197	141	22	1257

Site Code - EFDH
East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
68D	0-12	5/4/1995	EFDH-9505-362	95X-02599	1152	147	18	1211
68D	0-12	5/2/1995	EFDH-9505-350	95X-01934	1294	147	19	1354
69A	0-12	3/31/1995	EFDH-9503-323	95X-00411	746	94	13	804
69B	0-12	3/31/1995	EFDH-9503-324	95X-00412	755	87	11	813
69C	0-12	3/31/1995	EFDH-9503-325	95X-00413	704	95	11	762
69D	0-12	3/31/1995	EFDH-9503-326	95X-00414	1222	151	11	1282
70A	0-12	3/14/1995	EFDH-9503-293	95X-00121	1219	113	21	1279
70A	0-12	12/1/1994	EHDH-9412-288	94X-09980	1246	131	23	1309
70B	0-12	3/14/1995	EFDH-9503-294	95X-00122	1056	107	22	1115
70B	0-12	12/1/1994	EHDH-9412-287	94X-09979	1366	118	25	1430
70C	0-12	3/14/1995	EFDH-9503-295	95X-00123	958	107	18	1017
70C	0-12	12/1/1994	EHDH-9412-286	94X-09978	991	103	16	1053
70D	0-12	3/14/1995	EFDH-9503-296	95X-00124	861	83	23	920
70D	0-12	12/1/1994	EHDH-9412-285	94X-09977	998	99	17	1060
70DR	0-12	3/14/1995	EFDH-9503-297	95X-00125	871	95	17	930
75B	0-12	8/25/1994	EHDH-9408-237	94X-05320	953	103	20	1015
75BR	0-12	8/25/1994	EHDH-9408-238	94X-05321	976	102	21	1038
75C	0-12	8/25/1994	EHDH-9408-239	94X-05322	1056	106	22	1118
76A	0-1	8/30/1994	EHDH-9408-249	94X-05484	880	78	35	942
76A	0-1	8/31/1994	EHDH-9408-250	94X-05485	733	70	23	795

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
76A	0-1	9/1/1994	EHDH-9408-251	94X-05951	928	61	41	990
76A	0-1	8/24/1994	EHDH-9408-232	94X-05319	443	43	13	505
76A	0-12	8/25/1994	EHDH-9408-240	94X-05323	1015	108	19	1077
76C	0-12	8/25/1994	EHDH-9408-241	94X-05324	1071	80	21	1133
76D	0-12	8/25/1994	EHDH-9408-242	94X-05325	841	77	16	903
76E	0-12	4/7/1995	EFDH-9504-339	95X-00808	565	93	9	623
76F	0-12	4/7/1995	EFDH-9504-340	95X-00809	903	117	18	962
76FR	0-12	4/7/1995	EFDH-9504-341	95X-00810	848	121	14	906
77A	0-12	4/7/1995	EFDH-9504-335	95X-00804	815	102	19	873
77B	0-12	4/7/1995	EFDH-9504-336	95X-00805	876	112	15	935
77C	0-12	4/7/1995	EFDH-9504-337	95X-00806	1112	136	15	1171
77D	0-12	4/7/1995	EFDH-9504-338	95X-00807	707	84	9	765
78A	0-12	4/7/1995	EFDH-9504-331	95X-00800	858	128	18	917
78B	0-12	4/7/1995	EFDH-9504-332	95X-00801	992	133	18	1051
78C	0-12	4/7/1995	EFDH-9504-333	95X-00802	947	125	15	1006
78D	0-12	4/7/1995	EFDH-9504-334	95X-00803	796	108	17	854
79C	0-12	3/31/1995	EFDH-9503-328	95X-00415	576	78	10	634
79D	0-12	3/31/1995	EFDH-9503-329	95X-00416	846	120	13	904
79DR	0-12	3/31/1995	EFDH-9503-330	95X-00417	864	116	10	923
80C	0-12	5/9/1995	EFDH-9505-363	95X-02592	473	70	10	531

Site Code - EFDH

East Field Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
80C	0-12	3/20/1995	EFDH-9503-306	95X-00217	1236	119	23	1296
80C	0-12	12/1/1994	EHDH-9412-289	94X-09981	1153	100	18	1216
80D	0-1	3/13/1995	EFDH-9503-291	95X-00109	1193	118	25	1253
80D	0-12	12/1/1994	EHDH-9412-290	94X-09982	1189	123	23	1252
80D	0-12	5/9/1995	EFDH-9505-364	95X-02593	523	88	8	581
80D	0-12	3/20/1995	EFDH-9503-307	95X-00218	988	114	18	1047
80DR	0-1	3/13/1995	EFDH-9503-292	95X-00110	1132	117	17	1191

ASARCO EAST HELENA
Residential Soils
Pre and Post Removal Report

Site Code - EFDP

East Field Disposal Pile

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
				Pre-Removal Samples				
EFK	0-1	3/13/1992	EFK-21	92Z-02703	6298	340	104	6885
EFK	0-1	3/13/1992	EFK-20	92Z-02702	727	156	14	847
EFL	0-1	3/13/1992	EFL-23	92Z-02711	5666	380	64	6196
EFL	0-1	3/13/1992	EFL-27	92Z-02715	7816	426	112	8542
EFL	0-1	3/13/1992	EFL-26	92Z-02714	5895	374	74	6446
EFL	0-1	3/13/1992	EFL-24	92Z-02712	4040	370	39	4425
EFL	0-1	3/13/1992	EFL-19	92Z-02710	4526	314	74	4954
EFL	0-1	3/13/1992	EFL-18	92Z-02709	5288	339	85	5784
EFL	0-1	3/13/1992	EFL-17	92Z-02708	5029	377	77	5501
EFL	0-1	3/13/1992	EFL-16	92Z-02707	3435	319	40	3767
EFL	0-1	3/13/1992	EFL-15	92Z-02706	3097	232	58	3400
EFL	0-1	3/13/1992	EFL-14	92Z-02705	3844	281	61	4211
EFL	0-1	3/13/1992	EFL-13	92Z-02704	2881	254	24	3166
EFL	0-1	3/13/1992	EFL-25	92Z-02713	5666	397	71	6196

East Field Disposal Pile

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
EFM	0-1	3/16/1992	EFM-16	92Z-02721	3864	355	40	4233
EFM	0-1	3/16/1992	EFM-19	92Z-02724	6628	403	97	7245
EFM	0-1	3/16/1992	EFM-27	92Z-02729	5442	395	93	5952
EFM	0-1	3/16/1992	EFM-26	92Z-02728	5977	446	51	6535
EFM	0-1	3/16/1992	EFM-25	92Z-02727	6309	403	71	6897
EFM	0-1	3/16/1992	EFM-24	92Z-02726	5593	397	58	6116
EFM	0-1	3/16/1992	EFM-23	92Z-02725	6381	425	86	6976
EFM	0-1	3/16/1992	EFM-17	92Z-02722	3898	316	46	4270
EFM	0-1	3/16/1992	EFM-11	92Z-02716	3553	265	49	3895
EFM	0-1	3/16/1992	EFM-15	92Z-02720	3716	311	46	4072
EFM	0-1	3/16/1992	EFM-14	92Z-02719	4388	333	55	4803
EFM	0-1	3/16/1992	EFM-13	92Z-02718	2373	259	25	2615
EFM	0-1	3/16/1992	EFM-12	92Z-02717	3106	257	44	3410
EFM	0-1	3/16/1992	EFM-18	92Z-02723	4657	304	79	5096
EFN	0-1	3/16/1992	EFN-12	92Z-02732	2987	275	34	3280
EFN	0-1	3/16/1992	EFN-23	92Z-02740	4520	358	38	4947
EFN	0-1	3/16/1992	EFN-19	92Z-02739	2406	234	44	2651
EFN	0-1	3/16/1992	EFN-18	92Z-02738	4206	303	68	4605
EFN	0-1	3/16/1992	EFN-17	92Z-02737	4072	296	70	4459
EFN	0-1	3/16/1992	EFN-16	92Z-02736	2606	267	28	2868

Site Code - EFDP

East Field Disposal Pile

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
EFN	0-1	3/16/1992	EFN-15	92Z-02735	3487	277	48	3823
EFN	0-1	3/16/1992	EFN-13	92Z-02733	2672	243	27	2939
EFN	0-1	3/16/1992	EFN-25	92Z-02742	5001	398	61	5471
EFN	0-1	3/16/1992	EFN-11	92Z-02730	2690	249	35	2959
EFN	0-1	3/16/1992	EFN-26	92Z-02743	5434	389	91	5943
EFN	0-1	3/16/1992	EFN-14	92Z-02734	3110	297	29	3414
EFN	0-1	3/16/1992	EFN-27	92Z-02744	6360	394	109	6953
EFN	0-1	3/16/1992	EFN-415 R.N27	92Z-02745	6505	440	96	7111
EFN	0-1	3/16/1992	EFN-24	92Z-02741	6267	438	69	6851
EFNR	0-1	3/16/1992	EFN-115	92Z-02731	2793	271	39	3070
EFO	0-1	3/17/1992	EFO-26	92Z-02761	5145	333	79	5628
EFO	0-1	3/17/1992	EFO-265 R26	92Z-02762	3662	285	66	4013
EFO	0-1	3/17/1992	EFO-25	92Z-02760	4043	362	35	4428
EFO	0-1	3/17/1992	EFO-24	92Z-02759	3184	303	21	3494
EFO	0-1	3/17/1992	EFO-23	92Z-02758	3173	305	26	3482
EFO	0-1	3/17/1992	EFO-22	92Z-02757	3466	320	32	3800
EFO	0-1	3/16/1992	EFO-21	92Z-02756	3472	290	10	3807
EFO	0-1	3/16/1992	EFO-20	92Z-02755	3795	299	32	4158
EFO	0-1	3/16/1992	EFO-18	92Z-02753	6928	411	114	7573
EFO	0-1	3/16/1992	EFO-17	92Z-02752	3682	264	72	4035

Site Code - EFDP

East Field Disposal Pile

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
EFO	0-1	3/16/1992	EFO-16	92Z-02751	3890	269	63	4261
EFO	0-1	3/16/1992	EFO-15	92Z-02750	3621	306	41	3969
EFO	0-1	3/16/1992	EFO-14	92Z-02749	3015	275	30	3311
EFO	0-1	3/16/1992	EFO-13	92Z-02748	3061	290	28	3361
EFO	0-1	3/16/1992	EFO-12	92Z-02747	2140	230	25	2364
EFO	0-1	3/16/1992	EFO-11	92Z-02746	2600	251	27	2861
EFO	0-1	3/16/1992	EFO-19	92Z-02754	5766	401	87	6305
EFP	0-1	3/17/1992	EFP-15	92Z-02767	3251	236	58	3567
EFP	0-1	3/17/1992	EFP-22	92Z-02774	3623	291	51	3971
EFP	0-1	3/17/1992	EFP-21	92Z-02773	5076	362	46	5553
EFP	0-1	3/17/1992	EFP-20	92Z-02772	5230	386	63	5721
EFP	0-1	3/17/1992	EFP-19	92Z-02771	5356	348	95	5858
EFP	0-1	3/17/1992	EFP-18	92Z-02770	5035	368	90	5508
EFP	0-1	3/17/1992	EFP-11	92Z-02763	2179	229	30	2406
EFP	0-1	3/17/1992	EFP-16	92Z-02768	3884	291	53	4255
EFP	0-1	3/17/1992	EFP-14	92Z-02766	2444	264	29	2692
EFP	0-1	3/17/1992	EFP-13	92Z-02765	2159	235	24	2384
EFP	0-1	3/17/1992	EFP-12	92Z-02764	2339	241	23	2579
EFP	0-1	3/17/1992	EFP-17	92Z-02769	4483	295	83	4907
EFQ	0-1	3/17/1992	EFQ-12	92Z-02775	3590	238	54	3935

Site Code - EFDP

East Field Disposal Pile

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
EFQ	0-1	3/17/1992	EFQ-13	92Z-02776	3458	250	68	3792
EFQ	0-1	3/17/1992	EFQ-14	92Z-02777	3655	259	75	4006
EFQ	0-1	3/17/1992	EFQ-15	92Z-02778	4369	307	72	4783
EFQ	0-1	3/17/1992	EFQ-16	92Z-02779	3791	301	48	4154
EFQ	0-1	3/17/1992	EFQ-17	92Z-02780	3045	279	29	3343
EFQ	0-1	3/17/1992	EFQ-175 R.Q17	92Z-02781	2292	264	26	2528
EFR	0-1	3/17/1992	EFR-12	92Z-02782	2523	219	43	2778

ASARCO EAST HELENA
Residential Soils
Pre and Post Removal Report

Site Code - EFGP
East Fields

Remediated - No

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
				Initial Samples				
01	0-1	3/24/1994	EFGP-9403-100	94X-00188	429	57	13	491
02	0-1	3/24/1994	EFGP-9403-101	94X-00189	381	70	9	443
03	0-1	3/24/1994	EFGP-9403-102	94X-00190	417	50	14	479
03 R	0-1	3/24/1994	EFGP-9403-103 R102	94X-00191	432	55	14	494
04	0-1	3/24/1994	EFGP-9403-104	94X-00192	1716	114	58	1783
05	0-1	3/24/1994	EFGP-9403-105	94X-00193	1528	69	48	1593

ASARCO EAST HELENA
Residential Soils
Pre and Post Removal Report

Site Code - WFDA

West Fields Disposal Area

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
				Pre-Removal Samples				
01P	0-15	7/25/1996	WFDA-9607-200	96X-05566	1711	190	32	1774
01P	15-30	7/25/1996	WFDA-9607-201	96X-05567	36	37	<5	95
02P	0-15	7/25/1996	WFDA-9607-202	96X-05568	2069	207	41	2135
02P	15-30	7/25/1996	WFDA-9607-203	96X-05569	173	35	<5	232
03P	0-15	7/25/1996	WFDA-9607-204	96X-05570	1679	178	34	1742
03P	15-30	7/25/1996	WFDA-9607-205	96X-05571	61	33	<5	120
04P	0-15	7/25/1996	WFDA-9607-206	96X-05572	1003	138	18	1062
04P	15-30	7/25/1996	WFDA-9607-207	96X-05573	49	56	<5	108
05P	0-15	7/25/1996	WFDA-9607-208	96X-05574	2018	233	38	2084
05P	15-30	7/25/1996	WFDA-9607-209	96X-05575	553	95	16	611
06P	0-15	7/25/1996	WFDA-9607-210	96X-05576	1774	244	24	1838
06P	15-30	7/25/1996	WFDA-9607-211	96X-05577	39	32	<5	98
07P	0-15	7/25/1996	WFDA-9607-212	96X-05578	1641	196	32	1704
07P	15-30	7/25/1996	WFDA-9607-213	96X-05579	263	62	8	322

Site Code - WFDA

West Fields Disposal Area

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
08P	0-15	7/25/1996	WFDA-9607-214	96X-05580	2596	263	57	2669
08P	15-30	7/25/1996	WFDA-9607-215	96X-05581	75	41	5	134
09P	0-15	7/25/1996	WFDA-9607-216	96X-05582	1909	188	41	1974
09P	15-30	7/25/1996	WFDA-9607-217	96X-05583	55	40	<5	114
10P	0-15	7/25/1996	WFDA-9607-218	96X-05584	1574	194	34	1636
10P	15-30	7/25/1996	WFDA-9607-219	96X-05585	52	49	<5	111
11P	0-15	7/25/1996	WFDA-9607-220	96X-05586	1322	166	26	1382
11P	15-30	7/25/1996	WFDA-9607-221	96X-05587	78	35	<5	137
12P	0-15	7/25/1996	WFDA-9607-222	96X-05588	397	83	8	455
12P	15-30	7/25/1996	WFDA-9607-223	96X-05589	67	40	<5	126
13P	0-15	7/25/1996	WFDA-9607-224	96X-05590	2317	251	29	2386
13P	15-30	7/25/1996	WFDA-9607-225	96X-05591	152	47	<5	211
14P	0-15	7/26/1996	WFDA-9607-226	96X-05593	1605	185	19	1667
14P	15-30	7/26/1996	WFDA-9607-227	96X-05594	29	27	<5	88
15P	0-15	7/26/1996	WFDA-9607-228	96X-05595	1175	171	26	1235
15P	15-30	7/26/1996	WFDA-9607-229	96X-05596	106	35	<5	165
16P	0-15	7/26/1996	WFDA-9607-230	96X-05597	1904	222	29	1969
16P	15-30	7/26/1996	WFDA-9607-231	96X-05598	90	48	<5	149

ASARCO EAST HELENA
Residential Soils
Pre and Post Removal Report

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
				Pre-Removal Samples				
100	0-15	7/16/1996	WFDH-9607-100	96X-04750	2210	173	38	2278
101	15-30	7/16/1996	WFDH-9607-101	96X-04751	2448	116	24	2519
102	0-15	7/16/1996	WFDH-9607-102	96X-04752	506	110	11	564
103	15-30	7/16/1996	WFDH-9607-103	96X-04753	484	78	13	542
104	0-15	7/16/1996	WFDH-9607-104	96X-04754	687	82	16	745
105	15-30	7/16/1996	WFDH-9607-105	96X-04755	387	73	11	445
106	0-15	7/16/1996	WFDH-9607-106	96X-04756	556	87	13	614
107	15-30	7/16/1996	WFDH-9607-107	96X-04757	101	62	<5	160
108	0-15	7/16/1996	WFDH-9607-108	96X-04758	1286	139	24	1346
109	15-30	7/16/1996	WFDH-9607-109	96X-04759	631	82	12	689
110	0-15	7/16/1996	WFDH-9607-110	96X-04760	709	101	15	767
111	15-30	7/16/1996	WFDH-9607-111	96X-04761	711	80	12	769
112	0-15	7/16/1996	WFDH-9607-112	96X-04762	531	95	13	589
113	15-30	7/16/1996	WFDH-9607-113	96X-04763	297	71	9	356

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
114	0-15	7/16/1996	WFDH-9607-114	96X-04764	56	28	<5	115
115	15-30	7/16/1996	WFDH-9607-115	96X-04765	52	32	<5	111
116	0-15	7/16/1996	WFDH-9607-116	96X-04766	396	92	14	454
117	15-30	7/16/1996	WFDH-9607-117	96X-04767	142	70	<5	201
118	0-15	7/16/1996	WFDH-9607-118	96X-04768	866	128	20	925
119	15-30	7/16/1996	WFDH-9607-119	96X-04769	278	50	7	337
120	0-15	7/16/1996	WFDH-9607-120	96X-04770	378	71	6	436
121	15-30	7/16/1996	WFDH-9607-121	96X-04771	66	40	<5	125
122	0-15	7/16/1996	WFDH-9607-122	96X-04772	841	106	19	899
123	15-30	7/16/1996	WFDH-9607-123	96X-04773	90	43	<5	149
124	0-15	7/16/1996	WFDH-9607-124	96X-04774	157	84	<5	216
125	15-30	7/16/1996	WFDH-9607-125	96X-04775	96	36	<5	155
813	0-12	10/24/1996	WFDH-9610-473	96X-10373	587	79	13	645
81A	0-12	10/24/1996	WFDH-9610-471	96X-10371	632	86	14	690
81AR	0-12	10/24/1996	WFDH-9610-475	96X-10375	616	79	12	674
81B	0-12	10/24/1996	WFDH-9610-472	96X-10372	395	45	10	453
81D	0-12	10/24/1996	WFDH-9610-474	96X-10374	716	86	15	774
82A	0-12	10/29/1996	WFDH-9610-469	96X-10369	662	79	11	720
82D	0-12	10/29/1996	WFDH-9610-470	96X-10370	420	70	14	478

Site Code - WFDH
West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
			Post-Removal Samples					
01A	0-12	6/19/1997	WFDH-9706-483	97X-01233	879	92	20	946
01B	0-12	6/19/1997	WFDH-9706-484	97X-01234	786	69	16	853
01C	0-12	6/18/1997	WFDH-9706-477	97X-01227	1099	109	22	1167
01D	0-12	6/18/1997	WFDH-9706-476	97X-01226	1335	110	33	1404
01P	0-4	7/25/1996	WFDH-9607-200	96X-05785	1750	192	32	1813
01P	16-30	7/25/1996	WFDH-9607-202	96X-05787	531	125	11	589
01P	4-16	7/25/1996	WFDH-9607-201	96X-05786	1556	140	29	1618
02A	0-12	6/19/1997	WFDH-9706-485	97X-01235	919	73	18	986
02B	0-12	6/19/1997	WFDH-9706-486	97X-01236	846	80	23	913
02C	0-12	6/18/1997	WFDH-9706-479	97X-01229	1006	98	45	1073
02D	0-12	6/18/1997	WFDH-9706-478	97X-01228	921	86	20	988
02P	0-4	7/25/1996	WFDH-9607-203	96X-05788	1030	107	23	1089
02P	16-30	7/25/1996	WFDH-9607-205	96X-05790	127	57	<5	186
02P	4-16	7/25/1996	WFDH-9607-204	96X-05789	1018	92	22	1077
03A	0-12	6/19/1997	WFDH-9706-487	97X-01237	1231	113	42	1300
03AR	0-12	6/19/1997	WFDH-9706-489	97X-01239	987	102	25	1054
03B	0-12	6/19/1997	WFDH-9706-488	97X-01238	895	90	19	962
03C	0-12	6/18/1997	WFDH-9706-481	97X-01231	872	74	15	939

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
03CR	0-12	6/18/1997	WFDH-9706-482	97X-01232	875	79	19	942
03D	0-12	6/18/1997	WFDH-9706-480	97X-01230	927	75	19	994
03P	0-4	7/25/1996	WFDH-9607-206	96X-05791	1951	168	37	2016
03P	16-30	7/25/1996	WFDH-9607-208	96X-05793	85	54	<5	144
03P	4-16	7/25/1996	WFDH-9607-207	96X-05792	1306	133	25	1366
04P	0-4	7/25/1996	WFDH-9607-209	96X-05794	1362	133	30	1423
04P	16-30	7/25/1996	WFDH-9607-211	96X-05796	384	81	9	442
04P	4-16	7/25/1996	WFDH-9607-210	96X-05795	1253	126	23	1313
05P	0-4	7/25/1996	WFDH-9607-212	96X-05797	1908	198	36	1973
05P	16-30	7/25/1996	WFDH-9607-214	96X-05799	946	110	19	1005
05P	4-16	7/25/1996	WFDH-9607-213	96X-05798	1361	150	32	1422
06P	0-4	7/25/1996	WFDH-9607-215	96X-05800	498	84	10	556
06P	16-30	7/25/1996	WFDH-9607-217	96X-05802	253	52	<5	312
06P	4-16	7/25/1996	WFDH-9607-216	96X-05801	638	87	14	696
07P	0-4	7/25/1996	WFDH-9607-218	96X-05803	953	125	20	1012
07P	16-30	7/25/1996	WFDH-9607-220	96X-05805	507	75	11	565
07P	4-16	7/25/1996	WFDH-9607-219	96X-05804	885	113	19	944
08P	0-4	7/25/1996	WFDH-9607-221	96X-05806	902	108	25	961
08P	16-30	7/25/1996	WFDH-9607-223	96X-05808	162	31	<5	221
08P	4-16	7/25/1996	WFDH-9607-222	96X-05807	703	83	17	761

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
09P	0-4	7/25/1996	WFDH-9607-224	96X-05809	1234	112	22	1294
09P	16-30	7/25/1996	WFDH-9607-226	96X-05811	271	55	<5	330
09P	4-16	7/25/1996	WFDH-9607-225	96X-05810	959	107	20	1018
10P	0-4	7/25/1996	WFDH-9607-227	96X-05812	422	80	12	480
10P	16-30	7/25/1996	WFDH-9607-229	96X-05814	338	55	5	396
10P	4-16	7/25/1996	WFDH-9607-228	96X-05813	322	60	8	380
11P	0-4	7/25/1996	WFDH-9607-230	96X-05815	987	147	26	1046
11P	16-30	7/25/1996	WFDH-9607-232	96X-05817	51	36	<5	110
11P	4-16	7/25/1996	WFDH-9607-231	96X-05816	807	105	18	865
12P	0-4	7/25/1996	WFDH-9607-233	96X-05818	211	34	<5	270
12P	16-30	7/25/1996	WFDH-9607-235	96X-05820	66	32	<5	125
12P	4-16	7/25/1996	WFDH-9607-234	96X-05819	256	38	<5	315
13P	0-4	7/25/1996	WFDH-9607-236	96X-05821	1439	114	22	1500
13P	16-30	7/25/1996	WFDH-9607-238	96X-05823	126	36	<5	185
13P	4-16	7/25/1996	WFDH-9607-237	96X-05822	1458	106	21	1519
21A	0-12	6/24/1997	WFDH-9706-497	97X-01292	802	80	17	869
21AR	0-12	6/24/1997	WFDH-9706-511	97X-01306	801	91	17	868
21B	0-12	6/24/1997	WFDH-9706-498	97X-01293	927	81	14	994
21C	0-12	6/19/1997	WFDH-9706-490	97X-01240	890	84	21	957
21D	0-12	6/19/1997	WFDH-9706-491	97X-01241	729	70	15	796

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
22A	0-12	6/24/1997	WFDH-9706-499	97X-01294	920	89	20	987
22B	0-12	6/24/1997	WFDH-9706-500	97X-01295	992	83	36	1059
22C	0-12	6/19/1997	WFDH-9706-492	97X-01242	859	88	20	926
22D	0-12	6/19/1997	WFDH-9706-493	97X-01243	835	60	19	902
23A	0-12	6/24/1997	WFDH-9706-501	97X-01296	987	92	29	1054
23B	0-12	6/24/1997	WFDH-9706-502	97X-01297	749	71	20	816
23C	0-12	6/19/1997	WFDH-9706-494	97X-01244	902	88	23	969
23D	0-12	6/19/1997	WFDH-9706-495	97X-01245	825	77	17	892
24A	0-12	6/24/1997	WFDH-9706-503	97X-01298	929	79	21	996
24D	0-12	6/19/1997	WFDH-9706-496	97X-01246	729	71	16	796
31A	0-12	7/7/1997	WFDH-9706-512	97X-01307	2175	223	45	2252
31B	0-12	7/7/1997	WFDH-9706-513	97X-01308	2091	168	38	2167
31C	0-12	6/24/1997	WFDH-9706-504	97X-01299	890	67	18	957
31D	0-12	6/24/1997	WFDH-9706-505	97X-01300	1612	138	37	1683
32A	0-12	7/7/1997	WFDH-9706-514	97X-01309	1322	112	29	1391
32B	0-12	7/7/1997	WFDH-9706-515	97X-01310	849	81	20	916
32C	0-12	6/24/1997	WFDH-9706-506	97X-01301	694	82	13	761
32D	0-12	6/24/1997	WFDH-9706-507	97X-01302	919	91	23	986
33A	0-12	7/7/1997	WFDH-9706-516	97X-01311	993	102	20	1060
33B	0-12	7/7/1997	WFDH-9706-517	97X-01312	899	95	18	966

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
33C	0-12	6/24/1997	WFDH-9706-508	97X-01303	769	82	15	836
33D	0-12	6/24/1997	WFDH-9706-509	97X-01304	1013	94	25	1080
34A	0-12	7/7/1997	WFDH-9706-518	97X-01313	965	93	20	1032
34AR	0-12	7/7/1997	WFDH-9706-519	97X-01314	993	86	18	1060
34D	0-12	6/24/1997	WFDH-9706-510	97X-01305	955	79	17	1022
41C	0-12	7/9/1997	WFDH-9706-521	97X-01316	2927	195	56	3015
41D	0-12	7/9/1997	WFDH-9706-520	97X-01315	2417	240	58	2497
42A	0-12	7/9/1997	WFDH-9706-527	97X-01322	1100	104	18	1168
42B	0-12	7/9/1997	WFDH-9706-528	97X-01323	1209	112	21	1277
42BR	0-12	7/9/1997	WFDH-9706-531	97X-01326	1195	110	24	1263
42C	0-12	7/9/1997	WFDH-9706-523	97X-01318	1134	108	23	1202
42D	0-12	7/9/1997	WFDH-9706-522	97X-01317	1035	103	18	1103
43A	0-12	7/9/1997	WFDH-9706-529	97X-01324	1167	111	26	1235
43B	0-12	7/9/1997	WFDH-9706-530	97X-01325	1436	127	36	1506
43C	0-12	7/9/1997	WFDH-9706-525	97X-01320	1047	108	23	1115
43D	0-12	7/9/1997	WFDH-9706-524	97X-01319	938	106	21	1005
44A	0-12	1/12/1999	WFDH-9901-569	99X-00030	893	122	12	960
44B	0-12	1/12/1999	WFDH-9901-570	99X-00031	904	104	13	971
44D	0-12	7/9/1997	WFDH-9706-526	97X-01321	856	104	24	923
52C	0-12	7/7/1997	WFDH-9706-534	97X-01328	804	99	20	871

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
52D	0-12	7/9/1997	WFDH-9706-533	97X-01327	836	73	19	903
53D	0-12	7/9/1997	WFDH-9706-535	97X-01329	745	101	13	812
54A	0-12	1/12/1999	WFDH-9901-565	99X-00026	1169	137	17	1237
54A	0-12	1/7/2000	WFDH-0001-587	00X-00021	832	93	18	899
54A	0-12	4/19/2000	WFDH0004-607/54A	00R-04219	481	72	10	554
54A	0-12	4/19/2000	WFDH0004-608/54A	00R-04220	480	65	7	553
54B	0-12	4/19/2000	WFDH0004-609/54B	00R-04221	632	86	14	705
54B	0-12	1/12/1999	WFDH-9901-566	99X-00027	636	100	9	703
54B	0-12	1/7/2000	WFDH-0001-588	00X-00022	564	66	12	631
54C	0-12	4/19/2000	WFDH0004-610/54C	00R-04222	479	69	8	552
54C	0-12	1/12/1999	WFDH-9901-567	99X-00028	872	121	13	939
54C	0-12	1/7/2000	WFDH-0001-589	00X-00023	698	100	12	765
54D	0-12	1/12/1999	WFDH-9901-568	99X-00029	1163	147	15	1231
54D	0-12	4/19/2000	WFDH0004-611/54D	00R-04223	530	77	11	603
54D	0-12	1/7/2000	WFDH-0001-590	00X-00024	589	68	14	656
62A	0-12	9/9/1997	WFDH-9709-544	97X-01573	783	88	19	850
62B	0-12	9/9/1997	WFDH-9709-545	97X-01574	868	89	16	935
62C	0-12	9/9/1997	WFDH-9709-547	97X-01576	791	83	17	858
62D	0-12	9/9/1997	WFDH-9709-548	97X-01577	1054	91	21	1122
63A	0-12	9/9/1997	WFDH-9709-546	97X-01575	693	79	13	760

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
63B	*0-12	1/19/2000	WFDH-0001-596	00X-00247	956	103	17	1023
63B	0-12	4/19/2000	WFDH0004-602/63B	00R-04214	908	94	18	981
63B	0-12	1/7/2000	WFDH-0001-594	00X-00028	992	95	18	1059
63BR	*0-12	1/19/2000	WFDH-0001-597	00X-00248	998	104	21	1065
63BR	0-12	1/7/2000	WFDH-0001-595	00X-00029	1037	113	21	1105
63D	0-12	9/9/1997	WFDH-9709-549	97X-01578	726	88	15	793
63DR	0-12	9/9/1997	WFDH-9709-550	97X-01579	742	75	17	809
64A	0-12	4/19/2000	WFDH0004-603/64A	00R-04215	669	75	16	742
64A	0-12	1/7/2000	WFDH-0001-583	00X-00017	829	89	14	896
64A	0-12	1/12/1999	WFDH-9901-560	99X-00021	1242	145	18	1311
64B	0-12	4/19/2000	WFDH0004-604/64B	00R-04216	613	82	13	686
64B	0-12	1/7/2000	WFDH-0001-584	00X-00018	480	75	9	547
64B	0-12	1/12/1999	WFDH-9901-561	99X-00022	502	81	6	569
64C	0-12	1/12/1999	WFDH-9901-563	99X-00024	669	95	6	736
64C	0-12	4/19/2000	WFDH0004-605/64C	00R-04217	580	90	9	653
64C	0-12	1/7/2000	WFDH-0001-585	00X-00019	506	75	13	573
64D	0-12	4/19/2000	WFDH0004-606/64D	00R-04218	508	64	8	581
64D	0-12	1/12/1999	WFDH-9901-564	99X-00025	1412	196	19	1482
64D	0-12	1/7/2000	WFDH-0001-586	00X-00020	684	74	12	751
65A	0-12	1/12/1999	WFDH-9901-562	99X-00023	480	87	8	547

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
72A	0-12	9/9/1997	WFDH-9709-536	97X-01565	682	87	14	749
72B	0-12	9/9/1997	WFDH-9709-537	97X-01566	737	73	17	804
72C	0-12	9/9/1997	WFDH-9709-540	97X-01569	818	81	17	885
72D	0-12	9/9/1997	WFDH-9709-541	97X-01570	1030	107	19	1098
73A	0-12	9/9/1997	WFDH-9709-538	97X-01567	671	81	21	738
73B	0-12	9/9/1997	WFDH-9709-539	97X-01568	788	95	20	855
73B	0-12	1/7/2000	WFDH-0001-592	00X-00026	706	85	18	773
73C	0-12	4/19/2000	WFDH0004-601/73-C	00R-04213	905	115	19	978
73C	0-12	9/9/1997	WFDH-9709-542	97X-01571	907	84	19	974
73C	0-12	1/7/2000	WFDH-0001-593	00X-00027	860	103	17	927
73D	0-12	9/9/1997	WFDH-9709-543	97X-01572	665	85	16	732
74A	0-12	1/7/2000	WFDH-0001-577	00X-00011	605	77	10	672
74A	0-12	1/12/1999	WFDH-9901-553	99X-00014	927	100	16	994
74B	0-12	1/12/1999	WFDH-9901-554	99X-00015	1335	159	24	1404
74B	0-12	1/7/2000	WFDH-0001-578	00X-00012	671	80	13	738
74C	0-12	1/7/2000	WFDH-0001-579	00X-00013	754	107	13	821
74C	0-12	1/12/1999	WFDH-9901-556	99X-00017	1731	178	23	1803
74C	0-12	4/19/2000	WFDH0004-599/74C	00R-04211	876	106	17	949
74D	0-12	1/12/1999	WFDH-9901-557	99X-00018	703	97	11	770
74D	0-12	1/7/2000	WFDH-0001-580	00X-00014	819	91	17	886

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
74D	0-12	4/19/2000	WFDH0004-600/74D	00R-04212	774	84	14	847
75A	0-12	1/7/2000	WFDH-0001-581	00X-00015	689	104	21	756
75A	0-12	1/12/1999	WFDH-9901-555	99X-00016	958	114	12	1025
75D	0-12	1/12/1999	WFDH-9901-558	99X-00019	465	76	8	532
75D	0-12	1/7/2000	WFDH-0001-582	00X-00016	733	99	9	800
75D	0-12	4/19/2000	WFDH0004-598/75-D	00R-04210	1069	99	21	1143
75D-R	0-12	1/12/1999	WFDH-9901-559	99X-00020	492	76	10	559
82B	0-12	9/19/1996	WFDH-9609-460	96X-08830	522	88	12	580
82C	0-12	9/19/1996	WFDH-9609-461	96X-08831	549	75	10	607
83A	0-12	9/19/1996	WFDH-9609-462	96X-08832	770	111	18	828
83B	0-12	9/19/1996	WFDH-9609-463	96X-08833	887	108	15	946
83C	0-12	9/19/1996	WFDH-9609-464	96X-08834	762	93	14	820
83D	0-12	9/19/1996	WFDH-9609-465	96X-08835	615	81	14	673
84A	0-12	9/19/1996	WFDH-9609-466	96X-08836	876	114	14	935
84B	0-12	1/7/2000	WFDH-0001-572	00X-00006	721	95	16	788
84B	0-12	1/7/2000	WFDH-0001-591	00X-00025	724	95	17	791
84B	0-12	9/19/1996	WFDH-9609-467	96X-08837	698	84	13	756
84C	0-12	1/7/2000	WFDH-0001-573	00X-00007	825	116	15	892
84C	0-12	1/12/1999	WFDH-9901-551	99X-00012	1153	115	15	1221
84D	0-12	1/7/2000	WFDH-0001-574	00X-00008	779	101	13	846

Site Code - WFDH

West Fields Direct Haul

Remediated - Yes

SECTOR	SAMPLE DEPTH	SAMPLE DATE	SAMPLE NUMBER	LAB NUMBER	Lead (mg/kg)	Arsenic (mg/kg)	Cadmium (mg/kg)	Lead U95 (mg/kg)
84D	0-12	9/19/1996	WFDH-9609-468	96X-08838	857	104	16	916
85A	0-12	1/7/2000	WFDH-0001-575	00X-00009	768	107	17	835
85D	0-12	1/7/2000	WFDH-0001-576	00X-00010	766	97	15	833
85D	0-12	1/12/1999	WFDH-9901-552	99X-00013	688	80	16	755

Appendix I

Existing Facilities Historical Water use Records

East Helena Existing School Water/Sewer Billing Data

By: Carrie Gardner

Date: 8.7.13

East HelenaExisting School Billing Data (received from E. Helena School District						
	Radley		EVMS		Office	
Bill Date	Water Usage (billed)	Billed?	Water Usage (billed)	Billed?	Water Usage (billed)	Billed?
6/30/2010	40000	No	59000	No	42000	Yes, 478.71
7/29/2010	802000	No	437000	No	35000	Yes, 478.71
8/30/2010	431000	No	607000	No	38000	Yes, 478.71
9/30/2010	68000	No	581000	No	17000	Yes, 478.71
10/27/2010	1000	No	307000	No	51000	Yes, 478.71
11/30/2010	62000	No	43000	No	1000	Yes, 478.71
12/29/2010	41000	No	31000	No	0	Yes, 478.71
1/28/2011	45000	No	32000	No	1000	Yes, 478.71
3/1/2011	52000	No	41000	No	1000	Yes, 478.71
3/31/2011	51000	No	38000	No	1000	Yes, 478.71
4/27/2011	40000	No	33000	No	5000	Yes, 478.71
5/26/2011	60000	No	46000	No	26000	Yes, 478.71
6/29/2011	118000	No	362000	No	27000	Yes, 478.71
7/28/2011	541000	No	531000	No	25000	Yes, 478.71
8/30/2011	201000	No	681000	No	44000	Yes, 478.71
9/29/2011	290000	No	598000	No	34000	Yes, 478.71
10/28/2011	55000	No	32000	No	1000	Yes, 478.71
11/30/2011	58999	No	37000	No	1000	Yes, 478.71
12/28/2011	44000	No	29000	No	0	Yes, 478.71
1/27/2012	45000	No	37000	No	1000	Yes, 478.71
2/28/2012	67000	No	44000	No	1000	Yes, 478.71
3/29/2012	61000	No	40000	No	1000	Yes, 478.71
4/27/2012	57000	No	30000	No	0	Yes, 478.71
5/31/2012	299000	No	578000	No	28000	Yes, 478.71

6/28/2012	311000	No	405000	No	32000	Yes, 478.71
7/30/2012	570000	No	800000	No	47000	yes, 570.72
8/29/2012	464000	No	608000	No	49000	yes, 570.72
9/27/2012	522000	No	629000	No	48000	yes, 570.72
10/30/2012	106000	No	123000	No	15000	yes, 570.72
11/29/2012	62000	No	33000	No	1000	yes, 570.72
12/27/2012	56000	No	34000	No	1000	yes, 570.72
1/29/2013	62000	No	35000	No	1000	yes, 570.72
2/28/2013	67000	No	40000	No	0	yes, 570.72
3/28/2013	76000	No	44000	No	1000	yes, 570.72
4/29/2013	57000	No	35000	No	1000	yes, 570.72
5/30/2013	213000	No	355000	No	32000	yes, 570.72
6/26/2013	228000	No	493000	No	45000	yes, 570.72

Wastewater rate is computed on the ave. water used starting with your October read and ending with your May read, any changes will be reflected in the July bills

Commercial Wastewater is based on the actual water usage each month. (*Need to verify assumption v

Average Monthly Water Use for Oct. thru May						
School year	**Radley (gal)**	**Radley GPD**	**Radley GPCD**	**EVMS (gal)**	**EVMS GPD**	**EVMS GPCD**
2010/2011	44000.00	1466.67	**3.05**	43000.00	1433.33	**3.64**
2011/2012	85874.88	2862.50	**5.95**	103375.00	3445.83	**8.75**
2012/2013	87375.00	2912.50	**6.06**	87375.00	2912.50	**7.39**
Average monthly Water Use for Sept. thru June						
School year	**Radley (gal)**	**Radley GPD**	**Radley gpcd**	**EVMS (gal)**	**EVMS GPD**	**EVMS GPCD**
2010/2011	53800.00	1793.33	**3.73**	151400.00	5046.67	**12.81**
2010/2012	128799.90	4293.33	**8.93**	183000.00	6100.00	**15.48**
2012/2013	144900.00	4830.00	**10.04**	182100.00	6070.00	**15.41**

EVMS Student population	394
Radley Student Population	481

Average GPCD		
	Oct.-May	Sept-June
Radley	5.02	7.57
EVMS	6.59	14.57

Circular DEQ 4 pg 21			
**School, day:*		WW Range	Typ. Flow (gpcd)
With cafeteria, gym showers		15-30 gpm	25
With Cafeteria only		10-20 gpm	15
Without cafeteria, gym, showers		5-17 gpm	11

Appendix J
Public Meeting Records

AGENDA
SPECIAL MEETING
OF
THE BOARD OF TRUSTEES
EAST HELENA SCHOOL DISTRICT NO. 9
Thursday, November 13, 2014
East Valley Middle School Cafeteria
7:00 p.m.

DISCUSSION ITEMS

1. Property Evaluations.
2. Hear the Public – See Guidelines Below

FUTURE MEETING DATES AND AGENDA ITEMS

1. Regular Meeting – December 8, 2014 @ EVMS Library

ADJOURN

Citizen Participation

All citizens are welcome and are encouraged to attend all meetings of the Board. In accordance with Montana Open Meeting Law (2-3-203, MCA) it is required that citizens have an opportunity to address the board. All Board of Trustees meetings in which a quorum is present shall include an agenda item called ‘Hear the Public.’ The board shall adopt the following guidelines for this agenda item.

Hear the Public

Persons wanting to address the Board of Trustees on items not on the agenda can do so at this time.

a. Each person may address the Board at the time designated in the agenda by stepping to the front of the room or the podium, giving their name and address in an audible tone of voice for the record. Each individual shall limit his/her comments to the Board to three (3) minutes.

b. All remarks shall be addressed to the Board only and NOT to any member of the Board, staff or audience.

c. No person, other than the Board and the person having the floor, shall be permitted to enter into any discussion either directly or through a member of the Board, without the permission of the Presiding Officer.

d. No questions shall be directed towards any individuals except through the Presiding Officer.

e. Under Rules of Order, questions cannot be answered by the Board, only heard. The Board is not under any obligation to respond. It is illegal for the Board to take any action on comments.

f. Speakers will not mention specific names of individuals in a public forum due to rights of privacy. Individual attacks will NOT be tolerated.

g. Comments made by the person addressing the Board do not represent the opinions of the Board, or staff and are only the expressed opinion of the speaker.

PUBLIC MEETING

NOVEMBER 13, 2014

PUBLIC COMMENTS RECEIVED

Jean Riley - Why not use the road going into the old Asarco Housing. Hwy 12 already has 4 lanes of traffic, it might be easier to use.

James Schell - As a parent I feel that it is important for all the schools to be in the same area.

Jennifer Nye - It is my understanding that Helena Sand & Gravel would only donate their property if they could get a conditional work permit. Has this changed?

Superintendent Whitmoyer - After they stated this, we had not further communication with them.

Jennifer Nye - With the larger property, would we be able to use this property for both a high school and elementary?

Superintendent Whitmoyer - if we had 80 acres would could build 3 schools on that property.

Jennifer Nye - I would vote for the Dartman Property

Jean Riley - I am concerned about the property that is located on Hwy 12.

James Gonzales - I would not put a high school next to an elementary school, but I would also need more information before I could make a decision. My decision could change if I knew that we were talking about a high school only. Hwy 12 is busy, I would choose Lamping field first with the Dartman property second.

Jerry Hamlin - Have you considered the cost of the property. Schools need to be kept in a centralized district. I would choose Dartman, Lamping and then Helena Sand and Gravel.

Patty Dahl - Helena Sand and Gravel would have to be rezoned and the disposal cost for this site would have to be considered. I would not ever support Canyon Ferry and Hwy 12 property. Dartman Field would be my vote.

Mark Runkle - I am affiliated with Mountain View Meadows, and I am not here to show my support for Mountain View Meadows. Walkablity is important. I support Dartman.

Karen Goldsberry - If the district does get the Asarco property, can we sell some of this property to purchase other property.

Superintendent Whitmoyer - Asarco is considering giving the district 322 acres, and yes we could sell some of this property.

Jean Riley - Has there been any discussion on asking Helena Sand and Gravel to sell some of their property located near Valley Drive. This property would be more acres and closer to Dartman property.

Gary Brewer - Valley Drive is very narrow and with the increased traffic it could be a problem because it is so narrow, will this road be widen?

Moriah Bucy - Has there been any costs identified for busing? I vote no to building on the East field because of contamination of this property.

James Gonzales - Will neighborhood schools be available if we build a new school?

Superintendent Whitmoyer - When we eliminated neighborhood schools the district's overall school scores have improved exponentially. The district would not want to destroy these scores by moving back to neighborhood schools.

Heather Ireland - Would we still have shuttle service between schools?

Betsy Burns - Have you looked at other treatment levels for contaminated soil on these property?

Ron Whitmoyer - Yes we have.

Bob Church - Yes but we felt that it was not cost effective to not remove the soil, environmental rules could change in the future, but right not we felt it had to be removed.

Betsy Burns - What is the price per acre for each of their property?

Bob Church - Around $6,000.00 per acre based on similar property sales within the area. Eventually we will need to have an appraisal done to be sure.

Rebecca Ryland - Think about the future, Dartman fields are centrally located, the district could have transportation issues and water other sites . We need to think about bringing families to the district.

John Maxness - I like the Dartman Property

Scott St Clair - On the Mountain View Property, why are you not looking at current district property?

Superintendent Whitmoyer & **Joe Nye** - We have to think ahead on what will the district need in the future.

Scott St Clair - Where are the students coming from? Have you looked at that?

Superintendent Whitmoyer - 123 more homes are being proposed at the Holmburg Subdivision, there is Mud Flats, and 50 new homes are being proposed for somewhere on Keir Lane. That is just a few of the proposed subdivisions in our district.

Scott St Clair - Why not look at where the growth will be, if it is over by the Asarco property or Mountain View Meadows, then should we build over there? Why are we not going to till the ground and not remediate the property, what would be a cheaper cost?

Jerry Hamlin - Lets discuss growth, 200 to 300 hundred families could be at my new subdivision off of Canyon Ferry.

Angela Brewre - Canyon Ferry Road is very unsafe

Mark Diehl - Where is the cost estimate to remove the soil and what is the cost to replace this soil?

Bob Church - We would have to put soil in the green areas, but rest of the site would be parking area.

Michele Lingerfelter - Has there been any consideration on using Eastgate water and sewer?

Bob Church - Eastgate is in the middle of updating their wastewater and they are adding additional capacity in case the district buildings in their area, and they had recently received a water right for a well that was drilled 9 years ago.

Comments received at Central Office

JT & Michelle Lingerfelter- I just wanted to pipe in my vote for Dartman first & Lamping second. The meeting was great! We are looking forward to watching how it all evolves & benefits our community.

Michael Grover -Thank you, The Board, and Great West engineering for presenting the District's plan on expansion. For the record, I agree with the position of all in attendance at the meeting, the properties south of the railroad tracks are not viable options for acquisition. I support exploring the viability of the Dartman Property.

Kit & Vi Johnson - As usual, you know that you can count on Vi's and my support. My only comment/request for consideration, if you could be so kind as to pass it on, would be; if at all possible could the Board of trustees give a little extra weight to potential school locations <u>within</u> the city limits of East Helena.