



TECHNICAL MEMORANDUM

To: Greg Lovato, P.E., Nevada Division of Environmental Protection

From: Ranajit Sahu, Ph.D., C.E.M. (BRC)

cc: Stephen J. Cullen, P.G., C.E.M. (DBS&A)
John J. Dodge, P.G. (DBS&A)

Date: September 21, 2010

Subject: **Technical Memorandum – Indicator Parameter Selection**
BMI Common Areas (Eastside-Main and Eastside-Hook Areas)
Clark County, Nevada

INTRODUCTION AND OBJECTIVES

Since 2004 Basic Remediation Company (BRC) has conducted several investigations at the BMI Eastside Common Areas (the “Site”) (Figure 1) to evaluate geologic and hydrogeologic conditions and groundwater quality. Since the completion of an initial groundwater sampling event in 2004, groundwater monitoring has been conducted and reported over six additional events or “rounds” completed between 2006 and 2009 (DBS&A, 2010b). Analytes of interest (AOIs) were identified from the laboratory data in each of the six groundwater monitoring reports (MWH, 2006a, 2006b, 2007a, 2007b, 2008; DBS&A, 2010b).

Prior to the 2009 monitoring event, the AOIs were based on number of detections, maximum concentrations, and number of detections exceeding U.S. Environmental Protection Agency (U.S. EPA) maximum contaminant level (MCLs), U.S. EPA Region 6 medium-specific screening levels (MSSLs), or Nevada Division of Environmental Protection (NDEP) provisional

action levels (ALs). In the 2009 groundwater monitoring report (DBS&A, 2010b), the 2009 data were screened by number and frequency of detections, maximum concentrations, and number of detections exceeding U.S. EPA MCLs and/or NDEP's November 2009 Basic Comparison Levels (BCLs) to develop a short list of AOIs. Data earlier than 2009 had not been screened against current BCLs.

In a project meeting on July 27, 2010, NDEP requested that BRC screen the full groundwater monitoring dataset for AOIs or "indicator parameters" (IPs) using guidance developed by U.S. EPA for selecting "indicator chemicals" (U.S. EPA, 1986, 1988). These IPs will be defined to assist with development of:

- A Groundwater Remedial Alternatives Study (RAS) (including remedial action objectives, remedial technology selection, and remedial technology design); and
- Future groundwater monitoring events.

In accordance with NDEP's request, Daniel B. Stephens & Associates, Inc. (DBS&A) reviewed the 1986 guidance from U.S. EPA and completed a data screening process using the historical groundwater monitoring dataset. Data from the Shallow, Middle, and Deep zones at the Eastside-Hook area and the Eastside-Main area were evaluated to develop IP lists for the three zones in these two areas. This technical memorandum presents the methods and results of the data screening and presents the lists of IPs developed.

BRC recognizes that conceptual site model (CSM) development will not be restricted to the interpretation of only the selected IPs, but will use the full historical groundwater monitoring dataset available to characterize groundwater conditions. In addition, future monitoring events will not necessarily be restricted to include only the IPs.

This revised technical memorandum addresses NDEP comments dated September 1, 2010 to the draft technical memorandum dated August 18, 2010. BRC's responses to NDEP's comments are provided in Attachment 1.

METHODS

U.S. EPA guidance presents a systematic screening methodology for determining a short list of “indicator chemicals” for a site under investigation using a four-step scoring process (U.S. EPA, 1986, 1988):

1. Identify chemicals present;
2. Determine representative concentrations;
3. Calculate scores based on representative concentrations and toxicity data; and
4. Select indicator chemicals.

The activities completed to follow each of these steps are outlined in the following subsections.

Step 1: Identify Chemicals Present

For Step 1, the data from BRC’s six groundwater monitoring events were compiled to make one master list of detected compound data. In accordance with U.S. EPA guidance (U.S. EPA, 1989), those compounds detected above or equal to a frequency of detection (FOD) of 5 percent were retained in the list. Table 1 presents this initial list of indicator chemicals.

Tables 2 through 7 present summary statistics for detected compounds reported in each groundwater monitoring event (with FODs of 5 percent or greater), including the number of detections exceeding BCLs and MCLs. Parameters detected below BCLs/MCLs or those without defined BCLs/MCLs are also listed.

The BRC groundwater monitoring events have also included some off-site wells and the Eastside-Main upgradient wells AA-01, AA-27, and AA-UW-1 through AA-UW-6 (Figure 2). Data from these wells are not included in Tables 1 through 7.

Step 2: Determine Representative Concentrations

The mean (average) detected concentration was selected as the representative concentration for each compound to avoid potentially elevated IP scores due to outlier data.

BRC conservatively assumed that the detected organic compounds have no naturally occurring background concentrations, so the data were not screened against background values before IP scoring. As another conservative measure, all detected inorganics were carried forward in the screening. Both organic and inorganic detections in upgradient wells will be addressed by a statistical analysis detailed in a separate technical memorandum currently in preparation.

Step 3: Calculate Scores Based on Representative Concentrations and Toxicity Data

For Step 3, the U.S. EPA guidance refers to a table of toxicity constants to be used for scoring. However, the toxicity data for many chemicals have been updated since the U.S. EPA guidance was published in 1986. Therefore, current BCLs and MCLs were used as the toxicity criteria for scoring in Step 3. This is appropriate because the IP score is a comparison between representative concentrations and a toxicity-based concentration benchmark that is used to rank the Site chemicals (U.S. EPA, 1986).

The compounds identified in Step 1 were then scored by dividing the mean detected concentration by the BCL or MCL, and in accordance with U.S. EPA guidance, those compounds with the highest scores were identified as candidate IPs. Whereas U.S. EPA (1986) suggests that approximately 10 compounds may be sufficient for IP list development, BRC identified the top 20 compounds with the highest scores as candidate IPs. Additional parameters that have no BCL or MCL, or were detected below BCLs and MCLs but at a relatively high FOD, were also considered. Scores for the proposed IPs are listed in Tables 8 through 13.

Plume shape and the magnitude of the detected concentrations of each candidate IP were also considered before identifying the final list of IPs. Plume maps for several parameters are provided in electronic format in Attachment 2.

U.S. EPA guidance (1986) suggests also using contaminant solubility and other physical/chemical parameters that drive environmental fate in determining IPs. However, BRC did not use these criteria for metals, due to the complexity associated with metals fate and transport under the potentially varying oxidation states and varying subsurface conditions across the Site. In addition, BRC did not use these criteria for organics due to the relatively limited number of detected organic compounds.

BRC recognizes that future groundwater monitoring events may use an analyte list that includes, in addition to the selected IPs, other parameters useful to the CSM or useful for characterizing impacts due to off-site sources. As a result, once an IP was identified, its analytical class was added to the proposed groundwater monitoring parameter list for each area (Tables 8 through 13). For example, because alpha-BHC and beta-BHC are retained as IPs for the Eastside-Hook Area, other compounds in the organochlorine pesticide class, such as delta-BHC and gamma-chlordane, will be included as monitoring analytes. However, only selected wells will be sampled for these parameters where additional data are needed (sampling will be completed according to groundwater monitoring work plans developed for future events).

Step 4: Select Indicator Chemicals

The proposed IPs selected based on the detected compounds scoring are listed in Tables 8 through 13. Based on the methodology outlined above, the IP list for the Eastside-Hook Shallow Zone consists of (in descending order of IP score):

- Perchlorate
- alpha-BHC
- Chloroform
- beta-BHC
- Arsenic
- Total dissolved solids
- Lithium
- Nitrate
- Uranium
- Magnesium
- Selenium
- Molybdenum

The IP list for the Eastside-Main Shallow Zone consists of (in descending order of IP score):

- Perchlorate

- Chloroform
- Total dissolved solids
- Lithium
- alpha-BHC
- Arsenic
- Nitrate
- beta-BHC
- Magnesium
- Molybdenum
- Uranium
- Carbon tetrachloride
- Selenium

No IPs were identified for the Eastside-Hook Middle Zone. The IP list for the Eastside-Main Middle Zone includes only one parameter: perchlorate.

No IPs were identified for the Deep Zone in either area; however, perchlorate is identified as a Deep Zone monitoring parameter for both the Eastside-Hook and Eastside-Main areas. The full rationale for inclusion or exclusion as an IP is included in the table for each zone (Tables 8 through 13).

DISCUSSION

Plume maps (Attachment 2) show that several parameters are detected at higher concentrations off-site in the plants area than in wells located on BRC property (DBS&A, 2010b). These parameters include:

- Arsenic
- Tetrachloroethylene
- Carbon tetrachloride
- Total and hexavalent chromium
- Magnesium

- Perchlorate
- Chloroform (primary component of total trihalomethanes [TTHM] group)

BRC will account for impacts due to off-site sources during CSM and RAS development.

CONCLUSION

As discussed above, BRC will use the IP lists going forward during development of future groundwater monitoring events and the RAS. Specifically, for the RAS, BRC will also subject the IP compounds to the appropriate NDEP-approved statistical comparisons that are the subject of a separate technical memorandum. In addition, the IP lists may be updated, with NDEP concurrence, as new data become available.

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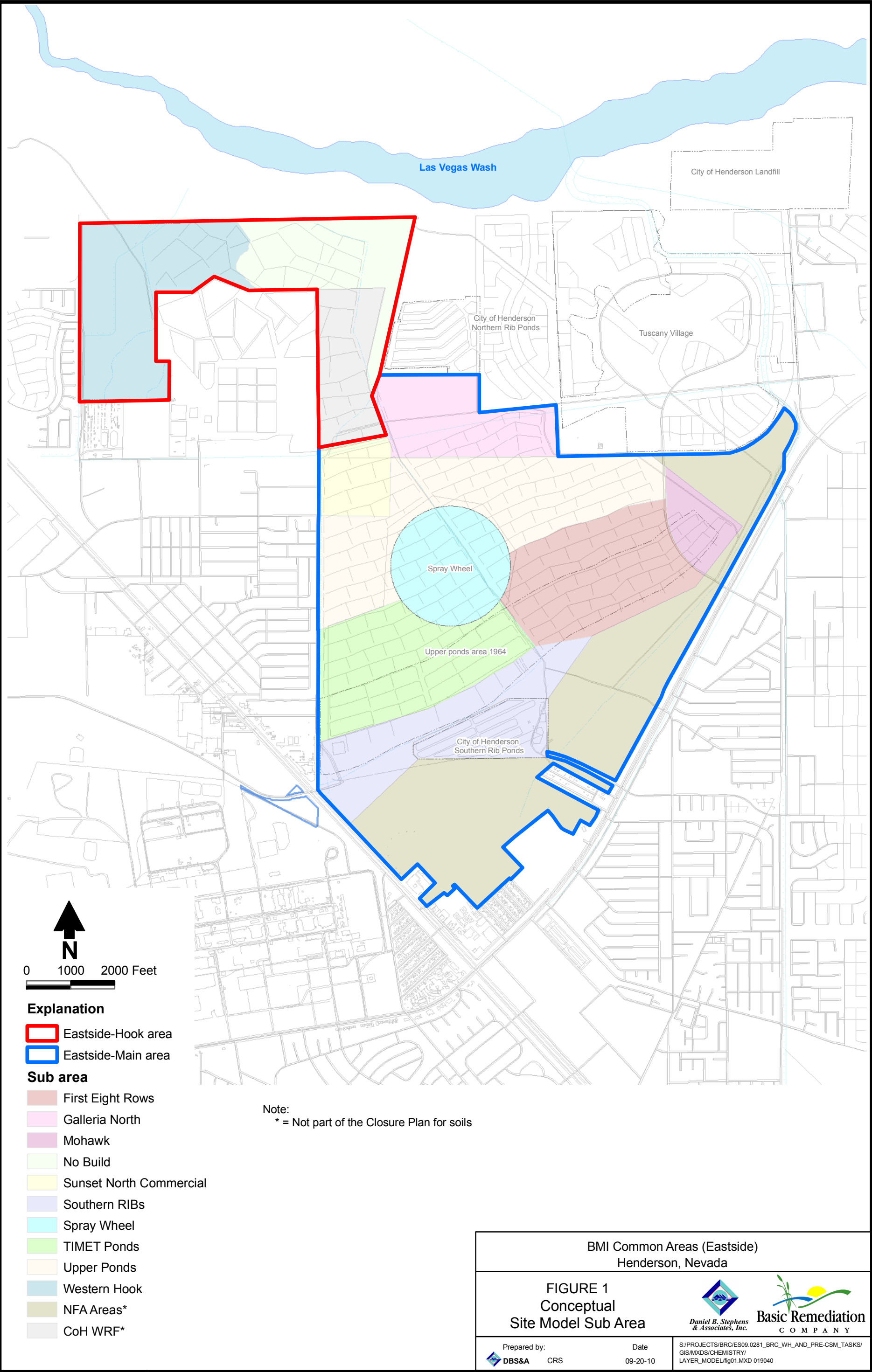
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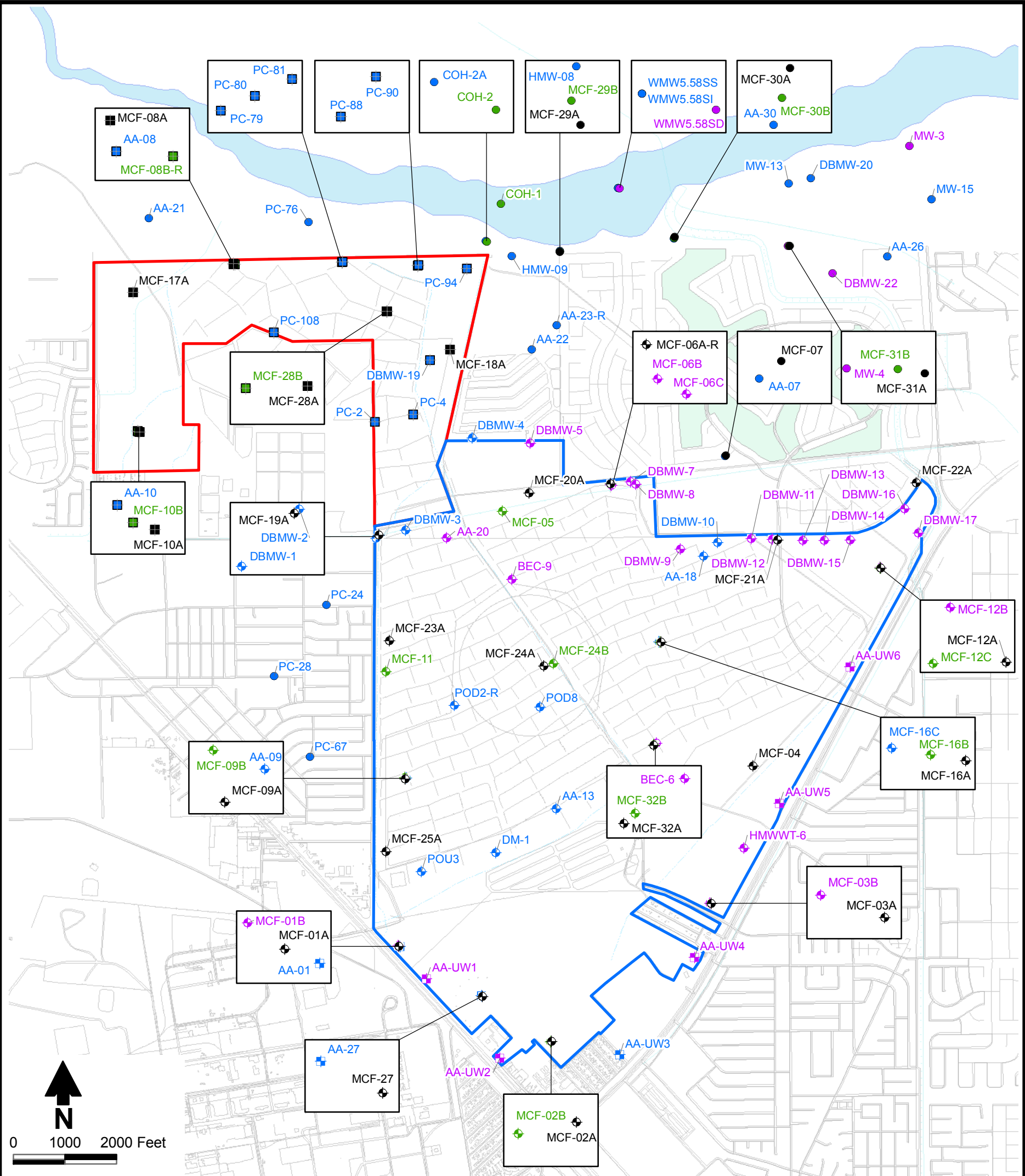
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Figures





Explanation

- Off-Site wells - Shallow Layer 1
- Off-Site wells - Shallow Layer 2
- Off-Site wells - Middle
- Off-Site wells - Deep
- On-Site Hook wells - Shallow Layer 1
- On-Site Hook wells- Middle
- On-Site Hook wells -Deep
- ⊕ On-Site Main wells - Shallow Layer 1
- ⊕ On-Site Main wells - Shallow Layer 2
- ⊕ On-Site Main wells - Middle
- ⊕ On-Site Main wells - Deep
- ⊕ Upgradient Main wells - Shallow Layer 1
- ⊕ Upgradient Main wells - Shallow Layer 2

- Eastside-Hook area
- Eastside-Main area
- Las Vegas Wash
- Street

BMI Common Areas (Eastside) Henderson, Nevada		
FIGURE 2 Groundwater Monitoring Program Wells		
Prepared by: DBS&A AFM	Date 08-09-10	S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\ALL_BRC_SAMPLED_WELLS.MXD 014190

Tables

Table 1. Initial List of Indicator Chemicals

Compounds with Site-Wide FOD ≥5%	Shallow Zone		Middle Zone		Deep Zone	
	Eastside-Hook Area	Eastside-Main Area	Eastside-Hook Area	Eastside-Main Area	Eastside-Hook Area	Eastside-Main Area
General Chemistry Parameters						
Ammonia	√	√	√	√	√	√
Bromide	√	√	√	√	√	√
Bromine	√	√	√	√	√	√
Chlorate	√	√	—	√	—	—
Chloride	√	√	√	√	√	√
Chlorine	√	√	√	√	√	√
Chlorite	√	√	—	√	—	√
Cyanide, total	—	√	√	—	√	√
Fluoride	√	√	√	√	√	√
Iodide	√	—	√	—	√	—
Nitrate	√	√	√	√	√	√
Nitrite	√	√	—	√	√	√
Orthophosphate	√	√	√	√	—	√
Perchlorate	√	√	√	√	√	√
Sulfate	√	√	√	√	√	√
Sulfide	√	√	—	—	√	√
Total Kjeldahl nitrogen	√	√	√	√	√	√
Metals						
Aluminum	√	√	—	√	√	√
Antimony	—	—	—	—	—	√
Arsenic	√	√	√	√	√	√
Barium	√	√	√	√	√	√
Beryllium	—	—	√	√	—	√
Boron	√	√	√	√	√	√
Cadmium	√	√	√	—	√	√
Calcium	√	√	√	√	√	√
Chromium (total)	√	√	√	√	√	√
Chromium (VI)	√	√	√	√	√	√
Cobalt	√	√	√	√	√	√
Copper	√	√	√	√	√	√
Iron	√	√	√	√	√	√
Lead	—	√	—	√	√	√
Lithium	√	√	√	√	√	√
Magnesium	√	√	√	√	√	√
Manganese	√	√	√	√	√	√
Mercury	—	√	—	—	—	√
Molybdenum	√	√	√	√	√	√
Nickel	√	√	√	√	√	√
Potassium	√	√	√	√	√	√
Selenium	√	√	√	√	√	√
Silver	—	—	—	—	—	√
Sodium	√	√	√	√	√	√
Strontium	√	√	√	√	√	√
Thallium	—	—	—	—	√	√
Tin	—	√	—	√	√	√
Titanium	√	√	√	√	√	√
Tungsten	√	√	—	√	√	√
Uranium	√	√	√	√	√	√
Vanadium	√	√	√	√	—	√
Zinc	√	√	√	√	√	√

FOD = Frequency of detection

√ = Detected at an FOD ≥ 5%

— = FOD <5% or not detected

Table 1. Initial List of Indicator Chemicals

Compounds with Site-Wide FOD ≥5%	Shallow Zone		Middle Zone		Deep Zone	
	Eastside-Hook Area	Eastside-Main Area	Eastside-Hook Area	Eastside-Main Area	Eastside-Hook Area	Eastside-Main Area
Organochlorine Pesticides						
alpha-BHC	√	√	—	—	—	—
beta-BHC	√	√	√	—	—	—
delta-BHC	√	—	—	—	—	—
gamma-Chlordane	√	√	—	—	—	—
Volatile Organic Compounds						
1,1-Dichloroethane	√	√	—	—	—	—
1,1-Dichloroethene	—	√	—	—	—	—
1,2,4-Trichlorobenzene	√	—	—	—	—	—
1,2-Dichlorobenzene	√	—	√	—	—	—
1,3,5-Trichlorobenzene	√	—	—	—	—	—
1,3-Dichlorobenzene	√	—	—	—	—	—
1,4-Dichlorobenzene	√	—	√	—	—	—
4-Methyl-2-pentanone	—	—	—	—	√	—
Acetone	—	—	—	√	√	√
Benzene	—	—	√	√	√	√
Bromodichloromethane	—	√	—	—	—	—
Bromomethane	—	—	—	√	—	—
Carbon disulfide	—	—	—	√	—	—
Carbon tetrachloride	√	√	—	—	—	—
Chlorobenzene	√	—	√	—	—	—
Chloroethane	—	—	√	—	—	—
Chloroform	√	√	√	√	√	√
Chloromethane	√	√	√	√	√	√
Methyl iodide	—	—	—	—	√	—
MTBE (Methyl tert-butyl ether)	√	√	—	—	—	—
Styrene	—	—	—	—	—	√
Tetrachloroethene	√	√	—	—	—	—
Toluene	—	√	√	√	√	√
Total trihalomethanes	√	√	√	√	√	√
Trichloroethene	√	√	—	—	—	—
Vinyl chloride	—	—	—	—	√	√
Water Quality Parameters						
Bicarbonate alkalinity	√	√	√	√	√	√
Carbonate alkalinity	—	—	√	√	√	√
Conductivity	√	√	√	√	√	√
Hardness	√	√	√	√	√	√
Hydroxide alkalinity	—	—	—	—	—	√
Total alkalinity	√	√	√	√	√	√
Total dissolved solids	√	√	√	√	√	√
Total inorganic carbon	√	√	√	√	√	√
Total organic carbon	√	√	√	√	√	√
Total suspended solids	√	√	√	√	√	√

FOD = Frequency of detection

√ = Detected at an FOD ≥ 5%

— = FOD <5% or not detected

Table 2. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Shallow Zone – Eastside-Hook Area

Class	Method	CAS ID	Compounds with FOD ≥ 5%	Units	MCL	BCL	Total Analyses	Detection Frequency	Detected Data						IP Score
									Total Detections	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	75	100%	75	939	2070	3760	75	75	517.50
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	74	85.1%	63	0.64	4040	17800	—	59	224.44
Gen Chem	E300	14797-65-0	Nitrite	mg/L	1	1	62	16.1%	10	19.8	54.5	141	10	10	54.50
OCPs	SW8081	319-84-6	alpha-BHC	µg/L	—	0.011	63	39.7%	25	0.051	0.214	0.35	—	25	19.45
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	65	66.2%	43	0.084	22.1	140	—	27	13.81
OCPs	SW8081	319-85-7	beta-BHC	µg/L	—	0.037	63	73.0%	46	0.059	0.511	1.2	—	46	13.81
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	65	72.3%	47	7.5	84.7	177	46	46	8.47
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	65	100%	65	1300	4100	8400	65	—	8.2
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	65	73.8%	48	121	264	516	—	48	3.62
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	65	50.8%	33	14.2	716	3860	—	19	3.58
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	65	80.0%	52	0.33	785	1770	—	33	1.54
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	76	80.3%	61	0.012	15.3	297	24	24	1.53
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	65	98.5%	64	8.7	31.6	68.8	30	30	1.05
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	65	47.7%	31	0.39	9.85	23.3	—	12	0.90
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	77	100%	77	48600	169000	392000	—	27	0.82
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	65	44.6%	29	11.5	36.8	131	7	7	0.74
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	65	89.2%	58	5.7	106	548	—	11	0.59
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	65	43.1%	28	7.77	44.7	210	1	1	0.45
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	65	23.1%	15	3.4	43	111	1	1	0.43
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	65	100%	65	3700	8680	14400	—	0	0.40
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	77	97.4%	75	0.14	1.46	4.3	1	1	0.37
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	65	98.5%	64	760	2060	4690	—	0	0.28
VOCs	SW8260	127-18-4	Tetrachloroethene	µg/L	5	5	65	56.9%	37	0.067	1.32	4.7	0	0	0.26
Metals	SW6020	7440-62-2	Vanadium	µg/L	—	180	64	46.9%	30	1.8	45.4	119	—	0	0.25
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	65	100%	65	0.34	15.2	141	6	—	0.19
Gen Chem	EPA 300.1	1318-59-8	Chlorite	µg/L	1000	—	64	6.3%	4	100	163	220	0	—	0.163
VOCs	SW8260	56-23-5	Carbon tetrachloride	µg/L	5	5	65	7.7%	5	0.17	0.664	1.3	0	0	0.13
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	54	64.8%	35	85.6	2810	10800	—	0	0.11
Metals	SW6020	7440-43-9	Cadmium	µg/L	5	5	65	10.8%	7	0.062	0.486	0.82	0	0	0.10
Metals	SW6020	7440-33-7	Tungsten	µg/L	—	270	65	10.8%	7	5.5	24.8	104	—	0	0.09
VOCs	SW8260	79-01-6	Trichloroethene	µg/L	5	5	65	24.6%	16	0.13	0.407	1.1	0	0	0.08
Metals	SW6020	7429-90-5	Aluminum	µg/L	—	36500	65	64.6%	42	38.4	2370	13300	—	0	0.06
VOCs	SW8260	75-34-3	1,1-Dichloroethane	µg/L	—	12	65	38.5%	25	0.12	0.724	2.7	—	0	0.06
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	65	86.2%	56	2.4	26.2	53.9	—	0	0.04
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	65	95.4%	62	12.8	59.4	314	0	0	0.03
VOCs	SW8260	106-46-7	1,4-Dichlorobenzene	µg/L	75	75	65	35.4%	23	0.19	1.82	5.9	0	0	0.02
VOCs	SW8260	120-82-1	1,2,4-Trichlorobenzene	µg/L	70	70	65	41.5%	27	0.28	1.21	2.3	0	0	0.02
VOCs	SW8260	541-73-1	1,3-Dichlorobenzene	µg/L	—	110	65	35.4%	23	0.082	1.72	7.1	—	0	0.02

Table 2. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Shallow Zone – Eastside-Hook Area

Class	Method	CAS ID	Compounds with FOD ≥ 5%	Units	MCL	BCL	Total Analyses	Detection Frequency	Detected Data						IP Score
									Total Detections	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
VOCs	SW8260	1634-04-4	MTBE (Methyl tert-butyl ether)	µg/L	—	35	65	7.7%	5	0.23	0.404	0.6	—	0	0.01
VOCs	SW8260	108-90-7	Chlorobenzene	µg/L	100	100	65	13.8%	9	0.26	0.81	1.4	0	0	0.01
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	65	61.5%	40	3.5	10.6	28.1	0	0	0.01
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	65	26.2%	17	11.5	78.8	595	—	0	0.01
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	65	9.2%	6	0.24	0.428	0.76	—	0	0.01
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	65	72.3%	47	3	89.6	658	—	0	0.00
VOCs	SW8260	95-50-1	1,2-Dichlorobenzene	µg/L	600	600	65	13.8%	9	0.14	0.348	0.71	0	0	0.00
Gen Chem	E376.1	18496-25-8	Sulfide	mg/L	—	—	35	11.4%	4	1.1	11.5	23.8	—	—	—
Gen Chem	E300	20461-54-5	Iodide	mg/L	—	—	77	15.6%	12	0.128	44.1	501	—	—	—
Gen Chem	E300	O-PO4	Orthophosphate	mg/L	—	—	74	33.8%	25	0.14	195	3450	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	75	53.3%	40	0.46	13.8	496	—	—	—
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	77	54.5%	42	0.23	6.63	248	—	—	—
Gen Chem	E300	7790-93-4	Chlorate	mg/L	—	—	77	54.5%	42	0.23	32.8	128	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	62	64.5%	40	0.12	1.12	5.1	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	77	100%	77	470	1040	1880	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	77	100%	77	574	1810	3960	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	77	100%	77	111000	382000	658000	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	77	100%	77	14900	39000	130000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	77	100%	77	396000	691000	1180000	—	—	—
OCPs	SW8081	5103-74-2	gamma-Chlordane	µg/L	—	—	63	17.5%	11	0.05	0.0895	0.13	—	—	—
OCPs	SW8081	319-86-8	delta-BHC	µg/L	—	—	63	46.0%	29	0.054	0.291	0.86	—	—	—
VOCs	SW8260	108-70-3	1,3,5-Trichlorobenzene	µg/L	—	—	65	33.8%	22	0.19	1.63	11	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	65	64.6%	42	0.95	264	4100	—	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	65	70.8%	46	12.4	66.2	224	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	75	96.0%	72	84	216	656	—	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	77	96.1%	74	84	213	656	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	60	100%	60	5.5	7.07	8.2	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	61	100%	61	2330	4750	9140	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	65	100%	65	520	1640	3020	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	65	100%	65	1	96.9	1060	—	—	—

FOD = Frequency of detection

MCL = USEPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 3. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Shallow Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	168	99.4%	167	86.1	2630	16200	167	167	657.50
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	175	98.9%	173	10.1	5190	31800	—	166	288.33
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	144	94.4%	136	0.47	161	1400	—	120	100.63
Gen Chem	E300	14797-65-0	Nitrite	mg/L	1	1	153	7.2%	11	0.12	46.1	245	7	7	46.10
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	143	98.6%	141	700	6470	48800	141	—	12.94
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	144	74.3%	107	87.5	657	6430	—	107	9.00
OCPs	SW8081	319-84-6	alpha-BHC	µg/L	—	0.011	137	35.8%	49	0.047	0.0901	0.18	—	49	8.19
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	144	68.8%	99	16.3	71.1	653	99	99	7.11
VOCs	SW8260	75-27-4	Bromodichloromethane	µg/L	—	1.1	144	16.7%	24	0.1	5.6	32	—	6	5.09
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	178	97.2%	173	0.015	21.6	111	130	130	2.16
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	144	100%	144	0.34	154	1456	62	—	1.925
OCPs	SW8081	319-85-7	beta-BHC	µg/L	—	0.037	137	13.1%	18	0.048	0.0676	0.099	—	18	1.83
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	178	100%	178	105	362000	3830000	—	106	1.75
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	144	98.6%	142	7.5	200	2600	—	25	1.11
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	143	51.7%	74	4.1	105	625	26	26	1.05
VOCs	SW8260	127-18-4	Tetrachloroethene	µg/L	5	5	144	58.3%	84	0.066	5.1	41	22	22	1.02
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	144	79.9%	115	1.7	90.3	670	29	29	0.90
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	144	86.8%	125	1.8	26.4	93.5	41	41	0.88
VOCs	SW8260	56-23-5	Carbon tetrachloride	µg/L	5	5	144	42.4%	61	0.13	4.36	25	18	18	0.87
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	144	49.3%	71	1.4	32.9	169	12	12	0.66
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	144	100%	144	1370	9730	19500	—	0	0.44
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	144	22.9%	33	8.2	79.3	475	—	4	0.40
Metals	SW6020	7439-92-1	Lead	µg/L	15	15	144	6.3%	9	0.25	5.5	22.3	1	1	0.37
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	144	97.2%	140	143	2260	6350	—	0	0.31
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	179	76.0%	136	0.01	1.21	38	3	3	0.30
Metals	SW6020	7440-43-9	Cadmium	µg/L	5	5	144	12.5%	18	0.044	1.34	10.9	1	1	0.27
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	144	15.3%	22	0.089	2.52	11.7	—	1	0.23
VOCs	SW8260	79-01-6	Trichloroethene	µg/L	5	5	144	39.6%	57	0.11	0.922	4.3	0	0	0.18
Metals	SW6020	7440-62-2	Vanadium	µg/L	—	180	143	43.4%	62	5.5	32	181	—	1	0.18
Gen Chem	EPA 300.1	1318-59-8	Chlorite	µg/L	1000	—	156	7.1%	11	51	137	210	0	—	0.137
VOCs	SW8260	75-35-4	1,1-Dichloroethene	µg/L	7	7	144	20.1%	29	0.22	0.758	2.2	0	0	0.11
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	101	45.5%	46	107	2350	6760	—	0	0.09
Gen Chem	E335.4/SW9012A	57-12-5	Cyanide, total	µg/L	200	200	79	10.1%	8	3.7	14.1	34.1	0	0	0.07
Metals	SW6020	7440-33-7	Tungsten	µg/L	—	270	144	11.8%	17	0.84	18.5	93	—	0	0.07
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	144	42.4%	61	0.59	19.6	108	—	0	0.04
VOCs	SW8260	75-34-3	1,1-Dichloroethane	µg/L	—	12	144	20.1%	29	0.096	0.428	0.99	—	0	0.04

Table 3. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Shallow Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	144	75.0%	108	0.73	15.6	62	—	0	0.02
Metals	SW6020	7429-90-5	Aluminum	µg/L	—	36500	144	23.6%	34	31.8	568	2650	—	0	0.02
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	142	20.4%	29	10.6	142	973	—	0	0.01
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	144	90.3%	130	7.8	25	273	0	0	0.01
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	144	45.1%	65	0.76	16.3	171	0	0	0.01
VOCs	SW8260	1634-04-4	MTBE (Methyl tert-butyl ether)	µg/L	—	35	144	6.9%	10	0.16	0.419	0.63	—	0	0.01
Metals	SW7470	7439-97-6	Mercury	µg/L	2	10.95	144	8.3%	12	0.028	0.065	0.16	0	0	0.01
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	144	10.4%	15	0.12	0.453	1.9	—	0	0.01
VOCs	SW8260	108-88-3	Toluene	µg/L	1000	1000	144	10.4%	15	0.07	0.218	1.3	0	0	0.00
Metals	SW6020	7440-31-5	Tin	µg/L	—	21900	144	6.9%	10	0.21	3.78	22.6	—	0	0.00
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	144	57.6%	83	1.4	14.9	126	—	0	0.00
Gen Chem	E376.1	18496-25-8	Sulfide	mg/L	—	—	95	8.4%	8	0.3	3.1	8.4	—	—	—
Gen Chem	E300	O-PO4	Orthophosphate	mg/L	—	—	172	20.3%	35	0.21	91.8	722	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	135	33.3%	45	0.099	4.56	112	—	—	—
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	179	64.8%	116	0.042	0.85	11.9	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	169	65.1%	110	0.084	1.72	23.8	—	—	—
Gen Chem	E300	7790-93-4	Chlorate	mg/L	—	—	180	82.2%	148	0.094	194	23000	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	178	98.9%	176	21	2830	19800	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	178	99.4%	177	26.4	1260	8100	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	178	99.4%	177	3730	215000	4110000	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	178	100%	178	76800	488000	971000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	178	100%	178	137000	730000	4480000	—	—	—
OCPs	SW8081	5103-74-2	gamma-Chlordane	µg/L	—	—	137	11.7%	16	0.053	0.153	0.42	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	144	56.3%	81	0.25	259	3340	—	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	136	71.3%	97	1.8	35.1	175	—	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	180	98.9%	178	27	105	496	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	144	99.3%	143	1	39.5	949	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	162	100%	162	1020	6430	43000	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	144	100%	144	300	2630	18200	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	144	100%	144	5.3	7.26	11.3	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	168	100%	168	48	105	496	—	—	—

FOD = Frequency of detection

MCL = USEPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 4. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Middle Zone – Eastside-Hook Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	13	100%	13	409	9480	29800	13	13	2370.00
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	10	100%	10	259	4590	19100	—	10	62.88
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	10	100%	10	2030	11600	45300	10	—	23.20
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	10	40.0%	4	74.4	1850	3290	—	3	9.25
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	14	92.9%	13	79000	1220000	4160000	—	6	5.89
OCPs	SW8081	319-85-7	beta-BHC	µg/L	—	0.037	9	11.1%	1	0.078	0.078	0.078	—	1	2.11
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	10	40.0%	4	3.2	860	2190	—	3	1.69
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	10	100%	10	26.3	301	978	—	4	1.67
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	10	50.0%	5	10.8	14.5	18.7	5	5	1.45
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	14	57.1%	8	0.13	21.3	167	—	1	1.18
Metals	SW6020	7440-41-7	Beryllium	µg/L	4	4	10	10.0%	1	3.5	3.5	3.5	0	0	0.88
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	9	11.1%	1	50.4	50.4	50.4	0	0	0.50
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	10	90.0%	9	906	3390	9920	—	1	0.46
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	10	100%	10	7390	9600	14100	—	0	0.44
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	10	20.0%	2	3	39	75	0	0	0.39
Metals	SW6020	7440-43-9	Cadmium	µg/L	5	5	10	30.0%	3	0.96	1.39	1.9	0	0	0.28
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	10	10.0%	1	0.44	0.44	0.44	—	0	0.28
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	10	20.0%	2	0.22	1.96	3.7	—	0	0.18
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	10	40.0%	4	4.1	8.1	12.9	0	0	0.16
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	14	50.0%	7	0.12	0.441	0.78	0	0	0.11
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	8	62.5%	5	309	2570	5240	—	0	0.10
Metals	SW6020	7440-62-2	Vanadium	µg/L	—	180	10	20.0%	2	13.5	14.9	16.2	—	0	0.08
VOCs	SW8260	108-90-7	Chlorobenzene	µg/L	100	100	10	20.0%	2	6.5	7.35	8.2	0	0	0.07
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	10	40.0%	4	0.46	1.22	1.7	0	0	0.04
VOCs	SW8260	71-43-2	Benzene	µg/L	5	5	10	20.0%	2	0.14	0.16	0.18	0	0	0.03
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	10	100%	10	17.5	50.9	240	0	0	0.03
Gen Chem	E335.4/SW9012A	57-12-5	Cyanide, total	µg/L	200	200	7	14.3%	1	2.9	2.9	2.9	0	0	0.01
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	10	80.0%	8	2.1	10.2	31.3	—	0	0.01
VOCs	SW8260	106-46-7	1,4-Dichlorobenzene	µg/L	75	75	10	20.0%	2	0.99	0.995	1	0	0	0.01
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	10	100%	10	0.34	0.987	4	0	—	0.01
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	12	50.0%	6	0.026	0.101	0.22	0	0	0.01
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	10	10.0%	1	0.73	0.73	0.73	—	0	0.01
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	10	50.0%	5	3.1	11.4	40.3	0	0	0.01
VOCs	SW8260	75-00-3	Chloroethane	µg/L	—	23	10	10.0%	1	0.19	0.19	0.19	—	0	0.01
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	10	10.0%	1	20.2	20.2	20.2	—	0	0.00
VOCs	SW8260	95-50-1	1,2-Dichlorobenzene	µg/L	600	600	10	20.0%	2	0.51	0.535	0.56	0	0	0.00
VOCs	SW8260	108-88-3	Toluene	µg/L	1000	1000	10	10.0%	1	0.36	0.36	0.36	0	0	0.00
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	10	50.0%	5	4.4	5.78	7.6	—	0	0.00

Table 4. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Middle Zone – Eastside-Hook Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	14	85.7%	12	0.11	3.17	30.6	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	13	84.6%	11	0.36	6.92	61.2	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	14	100.0%	14	148	4400	14900	—	—	—
Gen Chem	E300	20461-54-5	Iodide	mg/L	—	—	14	7.1%	1	0.131	0.131	0.131	—	—	—
Gen Chem	E300	O-PO4	Orthophosphate	mg/L	—	—	14	14.3%	2	1.3	179	356	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	14	100%	14	862	7060	22900	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	9	77.8%	7	0.14	1.88	4.7	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	14	100%	14	245000	392000	565000	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	14	100%	14	33700	577000	2370000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	14	100%	14	202000	3210000	11000000	—	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	14	100%	14	30	126	1010	—	—	—
Water Quality	E310.1	Q022	Carbonate alkalinity	mg/L	—	—	14	7.1%	1	8540	8540	8540	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	11	100%	11	2270	17700	54900	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	10	100%	10	980	4310	17300	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	10	100%	10	7.2	8.08	11.8	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	13	100%	13	30	57.6	80.4	—	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	10	50.0%	5	1.1	12.7	23.1	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	10	60.0%	6	0.24	582	3480	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	10	100%	10	2	90.8	811	—	—	—

FOD = Frequency of detection

MCL = U.S. EPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 5. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Middle Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	48	95.8%	46	190	12400	95200	46	46	3100.00
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	45	84.4%	38	39.4	7130	52500	—	36	97.67
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	45	100%	45	620	33700	180000	45	—	67.40
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	52	40.4%	21	0.13	712	10800	—	15	39.56
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	45	62.2%	28	24.4	3700	13800	—	16	18.50
Gen Chem	E300	14797-65-0	Nitrite	mg/L	1	1	40	10.0%	4	0.057	16.5	63.2	2	2	16.50
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	54	98.1%	53	61.9	3010000	15300000	—	17	14.54
Metals	SW6020	7439-92-1	Lead	µg/L	15	15	45	6.7%	3	8.5	201	489	2	2	13.40
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	45	51.1%	23	1.3	42.7	100	20	20	4.27
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	45	24.4%	11	0.14	5.45	50	—	2	3.41
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	45	86.7%	39	0.99	424	1580	—	14	2.36
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	45	75.6%	34	1.8	849	4530	—	12	1.66
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	45	13.3%	6	3.5	49.7	167	2	2	0.99
Metals	SW6020	7440-41-7	Beryllium	µg/L	4	4	45	6.7%	3	0.37	3.66	6.8	1	1	0.92
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	51	51.0%	26	0.0092	6.78	141	1	1	0.68
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	44	20.5%	9	5.3	48.7	237	1	1	0.49
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	45	91.1%	41	538	3220	14900	—	7	0.44
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	45	42.2%	19	4.71	36.4	280	1	1	0.36
Gen Chem	EPA 300.1	1318-59-8	Chlorite	µg/L	1000	—	46	6.5%	3	27	319	520	0	—	0.32
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	45	100%	45	589	6470	13200	—	0	0.30
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	54	70.4%	38	0.087	0.912	2.7	0	0	0.23
VOCs	SW8260	71-43-2	Benzene	µg/L	5	5	45	33.3%	15	0.1	0.705	1.7	0	0	0.14
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	45	42.2%	19	0.7	3.95	6.7	0	0	0.13
Metals	SW6020	7440-62-2	Vanadium	µg/L	—	180	45	37.8%	17	1.3	22.9	153	—	0	0.13
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	45	17.8%	8	0.34	1.37	4.6	—	0	0.12
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	39	41.0%	16	87.6	2880	17900	—	0	0.11
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	45	51.1%	23	2.6	147	1550	1	1	0.11
Metals	SW6020	7440-33-7	Tungsten	µg/L	—	270	45	6.7%	3	4.1	9.27	19	—	0	0.03
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	45	100%	45	0.34	2.33	53	0	—	0.03
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	45	26.7%	12	10.1	302	1550	—	0	0.03
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	45	80.0%	36	10.9	54	602	0	0	0.03
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	45	46.7%	21	3.5	12	38.7	—	0	0.02
Metals	SW6020	7429-90-5	Aluminum	µg/L	—	36500	45	11.1%	5	42	224	902	—	0	0.01
VOCs	SW8260	74-83-9	Bromomethane	µg/L	—	48	45	6.7%	3	0.2	0.263	0.35	—	0	0.01
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	45	13.3%	6	0.22	0.298	0.38	—	0	0.00
Metals	SW6020	7440-31-5	Tin	µg/L	—	21900	45	8.9%	4	1.7	26.7	101	—	0	0.00
VOCs	SW8260	67-64-1	Acetone	µg/L	—	32600	45	22.2%	10	5.8	27.3	140	—	0	0.00
VOCs	SW8260	108-88-3	Toluene	µg/L	1000	1000	45	13.3%	6	0.15	0.565	1.6	0	0	0.00

Table 5. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Middle Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
VOCs	SW8260	75-15-0	Carbon disulfide	µg/L	—	3520	45	20.0%	9	0.43	1.41	5.6	—	0	0.00
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	45	35.6%	16	2.6	10.1	31.2	—	0	0.00
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	54	48.1%	26	0.055	46.8	1210	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	48	45.8%	22	0.25	111	2420	—	—	—
Gen Chem	E300	7790-93-4	Chlorate	mg/L	—	—	54	9.3%	5	0.21	2.71	12.1	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	54	96.3%	52	32.6	5020	31800	—	—	—
Gen Chem	E300	O-PO4	Orthophosphate	mg/L	—	—	48	16.7%	8	1.3	1300	9780	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	54	100%	54	254	17900	80900	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	44	61.4%	27	0.15	3.16	11.7	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	54	100%	54	20200	344000	677000	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	54	98.1%	53	7990	3820000	16300000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	54	98.1%	53	170000	3260000	21500000	—	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	54	96.3%	52	22	98.9	346	—	—	—
Water Quality	E310.1	Q022	Carbonate alkalinity	mg/L	—	—	54	5.6%	3	186	1790	4940	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	48	100%	48	1030	19600	138000	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	45	100%	45	92	12400	64200	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	45	100%	45	6	7.8	11.9	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	48	100%	48	22	103	346	—	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	45	57.8%	26	1.8	20.4	52.4	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	45	44.4%	20	0.24	322	3270	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	45	88.9%	40	1	127	1370	—	—	—

FOD = Frequency of detection

MCL = U.S. EPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 6. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Deep Zone – Eastside-Hook Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	25	100%	25	2380	102000	247000	25	25	25500.00
Metals	SW6020	7440-28-0	Thallium	µg/L	2	2	21	9.5%	2	53.9	1020	1980	2	2	510.00
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	21	100%	21	1890	30700	77600	—	21	420.55
Gen Chem	E300	14797-65-0	Nitrite	mg/L	1	1	24	12.5%	3	0.21	193	532	2	2	193.00
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	21	90.5%	19	87.2	6470	22400	—	15	32.35
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	27	100%	27	154000	3150000	7050000	—	26	15.22
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	21	9.5%	2	57.7	347	636	2	2	6.94
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	27	29.6%	8	0.077	19.3	125	2	2	4.83
Metals	SW6020	7440-33-7	Tungsten	µg/L	—	270	21	19.0%	4	7.6	946	3090	—	2	3.50
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	21	38.1%	8	15.8	34.6	55.2	8	8	3.46
Metals	SW6020	7439-92-1	Lead	µg/L	15	15	20	15.0%	3	5.5	49.2	84.5	2	2	3.28
Metals	SW6020	7440-43-9	Cadmium	µg/L	5	5	18	27.8%	5	0.43	12	56.9	1	1	2.40
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	21	85.7%	18	3560	17200	110000	—	12	2.36
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	21	19.0%	4	3.6	21.1	61.5	—	1	1.92
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	21	90.5%	19	89	281	589	—	12	1.56
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	21	90.5%	19	24.7	640	1530	—	11	1.25
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	21	100%	21	9290	21200	69400	—	4	0.97
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	21	38.1%	8	1.2	20.5	139	1	1	0.68
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	21	9.5%	2	0.069	0.635	1.2	—	0	0.40
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	27	25.9%	7	0.031	7.04	17	—	0	0.39
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	21	14.3%	3	15	28.7	38	0	0	0.29
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	20	45.0%	9	83.9	5520	12600	—	0	0.22
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	21	23.8%	5	8.2	14.9	38.3	0	0	0.15
VOCs	SW8260	71-43-2	Benzene	µg/L	5	5	21	23.8%	5	0.071	0.576	0.98	0	0	0.12
VOCs	SW8260	75-01-4	Vinyl chloride	µg/L	2	2	21	9.5%	2	0.22	0.22	0.22	0	0	0.11
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	21	38.1%	8	21.9	668	2310	—	0	0.06
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	21	52.4%	11	13.8	31.2	68.7	—	0	0.04
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	21	38.1%	8	6.9	54.1	175	0	0	0.04
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	21	61.9%	13	20.3	52.5	142	0	0	0.03
Gen Chem	E335.4/SW9012A	57-12-5	Cyanide, total	µg/L	200	200	13	7.7%	1	4.8	4.8	4.8	0	0	0.02
Metals	SW6020	7429-90-5	Aluminum	µg/L	—	36500	21	9.5%	2	76.8	558	1040	—	0	0.02
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	25	8.0%	2	0.033	0.0865	0.14	0	0	0.01
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	21	23.8%	5	0.23	0.378	0.86	—	0	0.00
Metals	SW6020	7440-31-5	Tin	µg/L	—	21900	21	23.8%	5	1.9	44.8	117	—	0	0.00
VOCs	SW8260	67-64-1	Acetone	µg/L	—	32600	21	28.6%	6	1.9	10.3	34	—	0	0.00
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	21	28.6%	6	3	38.7	105	—	0	0.00
VOCs	SW8260	108-88-3	Toluene	µg/L	1000	1000	21	9.5%	2	0.083	0.217	0.35	0	0	0.00

Table 6. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Deep Zone – Eastside-Hook Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data						IP Score
									Count	Minimum	Mean	Maximum	Detections >MCL	Detections >BCL	
VOCs	SW8260	108-10-1	4-Methyl-2-pentanone	µg/L	—	2900	21	9.5%	2	0.51	0.6	0.69	—	0	0.00
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	28	7.1%	2	0.31	0.315	0.32	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	26	7.7%	2	0.62	0.635	0.65	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	27	100.0%	27	266	48000	123000	—	—	—
Gen Chem	E300	20461-54-5	Iodide	mg/L	—	—	28	14.3%	4	0.121	72.9	261	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	27	96.3%	26	3500	11400	26600	—	—	—
Gen Chem	E376.1	18496-25-8	Sulfide	mg/L	—	—	15	6.7%	1	4.2	4.2	4.2	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	21	100%	21	0.23	3.75	12	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	27	100%	27	319000	1070000	3120000	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	27	100%	27	116000	3140000	7840000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	27	100%	27	987000	24100000	60000000	—	—	—
Rads	Tracer Analysis	Delta-D	Delta-D	Pct	—	—	2	100%	2	65	65.5	65.9	—	—	—
VOCs	SW8260	74-88-4	Methyl iodide	µg/L	—	—	21	14.3%	3	0.36	0.397	0.46	—	—	—
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	21	100%	21	0.34	0.99	4	0	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	28	100%	28	24	56.4	128	—	—	—
Water Quality	E310.1	Q022	Carbonate alkalinity	mg/L	—	—	28	10.7%	3	32.8	38.9	48	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	24	100%	24	1300	75300	196000	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	21	100%	21	2160	15200	37000	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	21	100%	21	6.1	7.4	8.7	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	25	100%	25	24	61.9	128	—	—	—
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	20	100%	20	5400	83500	188000	20	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	21	57.1%	12	4.5	11.6	24	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	21	47.6%	10	0.65	6.67	36.2	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	21	95.2%	20	4	571	8560	—	—	—

FOD = Frequency of detection

MCL = U.S. EPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 7. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Deep Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data									IP Score
									Count	Minimum	Q1	Median	Mean	Q3	Maximum	Detections >MCL	Detections >BCL	
Gen Chem	E300.0	7782-50-5	Chlorine	mg/L	4	4	81	95.1%	77	181	281	1870	16500	12200	144000	77	77	4125.00
Gen Chem	E300	14797-65-0	Nitrite	mg/L	1	1	80	5.0%	4	0.15	4.91	62.1	201	536	679	3	3	201.00
Metals	SW6020	7439-93-2	Lithium	µg/L	—	73	73	86.3%	63	14.6	366	1290	8350	10800	48900	—	54	114.38
Water Quality	E160.1	Q594	Total dissolved solids	mg/L	500	—	69	98.6%	68	492	1170	5020	34700	74200	183000	66	—	69.4
Gen Chem	E350.1	7664-41-7	Ammonia	µg/L	—	200	73	79.5%	58	15.1	265	1470	4430	5060	26400	—	46	22.15
Metals	SW6020	7439-95-4	Magnesium	µg/L	—	207000	88	98.9%	87	59.1	25000	163000	3330000	7700000	16600000	—	35	16.09
Gen Chem	E300	14797-55-8	Nitrate	mg/L	10	10	86	30.2%	26	0.014	0.99	1.45	94	2.2	2410	1	1	9.40
Metals	SW6020	7439-98-7	Molybdenum	µg/L	—	180	73	98.6%	72	9.2	16.3	78.5	657	1160	4280	—	25	3.65
Metals	SW6020	7440-28-0	Thallium	µg/L	2	2	73	8.2%	6	0.19	3.27	5.85	7.3	10.1	21.2	5	5	3.65
Metals	SW6020	7440-38-2	Arsenic	µg/L	10	10	73	45.2%	33	1.8	12.7	18.2	21.6	29	88.3	28	28	2.16
Metals	SW6020	7439-96-5	Manganese	µg/L	—	510	73	87.7%	64	1.2	76.6	221	938	1120	7900	—	21	1.84
Metals	SW6020	7440-41-7	Beryllium	µg/L	4	4	73	5.5%	4	4	4.05	5.45	5.7	7.6	7.9	3	3	1.43
Gen Chem	EPA 300.1	1318-59-8	Chlorite	µg/L	1000	—	79	5.1%	4	270	405	1360	1250	1980	2000	2	—	1.25
Metals	SW6020	7439-92-1	Lead	µg/L	15	15	73	11.0%	8	0.26	4.83	6.6	18.2	22	82.4	2	2	1.21
Metals	SW6020	7440-47-3	Chromium (total)	µg/L	100	100	72	36.1%	26	0.61	9.53	40	87.7	72.4	944	5	5	0.88
Metals	SW6020	7440-36-0	Antimony	µg/L	6	6	73	5.5%	4	0.36	1.87	6.5	5.07	6.83	6.9	3	3	0.85
Metals	SW6020	7440-43-9	Cadmium	µg/L	5	5	71	22.5%	16	0.096	1.24	3.35	3.3	4.8	6.3	3	3	0.66
Metals	SW6020	7440-42-8	Boron	µg/L	—	7300	73	91.8%	67	141	772	1870	4720	10600	20700	—	21	0.65
Metals	SW6020	7782-49-2	Selenium	µg/L	50	50	73	11.0%	8	1.8	6.73	12.7	29.5	58.4	88.3	2	2	0.59
Metals	SW6020	7440-48-4	Cobalt	µg/L	—	11	73	28.8%	21	0.24	0.825	1.8	5.08	5.6	41	—	3	0.46
Metals	SW7196	18540-29-9	Chromium (VI)	µg/L	100	100	70	40.0%	28	3	20.3	27.5	31.6	39.5	80	0	0	0.32
Gen Chem	E314.0/SW6850	14797-73-0	Perchlorate	µg/L	—	18	87	19.5%	17	0.025	0.235	1	5.52	9.8	29.9	—	1	0.31
Metals	SW6020	7440-24-6	Strontium	µg/L	—	21900	73	100%	73	415	1300	8370	6200	9930	14600	—	0	0.28
Metals	SW6020	7439-89-6	Iron	µg/L	—	25600	65	49.2%	32	11.9	1060	2640	5860	5440	77600	—	1	0.23
VOCs	SW8260	67-66-3	Chloroform	µg/L	—	1.6	72	5.6%	4	0.16	0.168	0.315	0.348	0.56	0.6	—	0	0.22
Gen Chem	E300	16984-48-8	Fluoride	mg/L	4	4	89	56.2%	50	0.19	0.328	0.64	0.677	0.853	2.2	0	0	0.17
Metals	SW6020	7429-90-5	Aluminum	µg/L	—	36500	73	21.9%	16	40.6	71	196	5960	741	89100	—	1	0.16
VOCs	SW8260	71-43-2	Benzene	µg/L	5	5	72	48.6%	35	0.12	0.3	0.6	0.644	0.92	1.6	0	0	0.13
Metals	SW6020	7440-62-2	Vanadium	µg/L	—	180	73	30.1%	22	0.14	2.73	10.2	17.9	18.2	174	—	0	0.10
Metals	SW6020	7440-61-1	Uranium	µg/L	30	30	73	41.1%	30	0.069	1.28	1.95	2.87	2.43	16.4	0	0	0.10
VOCs	SW8260	75-01-4	Vinyl chloride	µg/L	2	2	72	8.3%	6	0.091	0.135	0.175	0.19	0.268	0.29	0	0	0.10
Metals	SW6020	7440-50-8	Copper	µg/L	1300	1360	73	42.5%	31	1.3	8.3	13.8	66.4	116	705	0	0	0.05
Metals	SW6020	7440-02-0	Nickel	µg/L	—	730	73	72.6%	53	2.1	7.65	13.4	33.3	25.9	461	—	0	0.05
Gen Chem	E335.4/SW9012A	57-12-5	Cyanide, total	µg/L	200	200	47	6.4%	3	3.9	3.9	7.6	7.9	12.2	12.2	0	0	0.04
Metals	SW6020	7440-39-3	Barium	µg/L	2000	2000	72	83.3%	60	14.3	19.2	28.8	75.9	40.2	1650	0	0	0.04
Metals	SW6020	7440-33-7	Tungsten	µg/L	—	270	73	15.1%	11	0.39	3.4	6.9	8.41	14	19	—	0	0.03
Metals	SW6020	7440-66-6	Zinc	µg/L	—	11000	73	35.6%	26	13.6	29.5	60.8	325	487	2050	—	0	0.03
VOCs	—	TTH	Total trihalomethanes	µg/L	80	—	72	100%	72	0.34	0.53	0.61	0.972	0.81	4	0	—	0.01215
VOCs	SW8260	74-87-3	Chloromethane	µg/L	—	81	72	18.1%	13	0.16	0.235	0.35	0.479	0.49	2.2	—	0	0.01
Metals	SW7470	7439-97-6	Mercury	µg/L	2	10.95	71	5.6%	4	0.028	0.0295	0.0375	0.0633	0.123	0.15	0	0	0.01
Metals	SW6020	7440-22-4	Silver	µg/L	—	180	73	5.5%	4	0.12	0.135	0.84	0.975	1.95	2.1	—	0	0.01

Table 7. BRC Groundwater Monitoring Data 2004-2009
Statistics and Indicator Parameter Scoring
Deep Zone – Eastside-Main Area

Class	Method	CAS ID	Compound List	Units	MCL	BCL	Total Count	Detection Frequency	Detected Data									IP Score
									Count	Minimum	Q1	Median	Mean	Q3	Maximum	Detections >MCL	Detections >BCL	
VOCs	SW8260	100-42-5	Styrene	µg/L	100	100	72	8.3%	6	0.08	0.0823	0.11	0.136	0.208	0.23	0	0	0.00
Metals	SW6020	7440-32-6	Titanium	µg/L	—	146000	73	42.5%	31	1.6	6.5	9.7	97.1	12.8	2640	—	0	0.00
VOCs	SW8260	67-64-1	Acetone	µg/L	—	32600	72	15.3%	11	1.1	1.6	6.6	12.7	16	46	—	0	0.00
VOCs	SW8260	108-88-3	Toluene	µg/L	1000	1000	73	19.2%	14	0.09	0.13	0.155	0.319	0.408	1	0	0	0.00
Metals	SW6020	7440-31-5	Tin	µg/L	—	21900	73	13.7%	10	0.89	0.955	2.45	5.29	13	13.5	—	0	0.00
Gen Chem	E300	24959-67-9	Bromide	mg/L	—	—	91	45.1%	41	0.11	0.185	0.24	0.991	0.685	6.9	—	—	—
Gen Chem	E300.0	7726-95-6	Bromine	mg/L	—	—	83	48.2%	40	0.21	0.37	0.535	2.12	1.85	13.8	—	—	—
Gen Chem	E300	16887-00-6	Chloride	mg/L	—	—	88	95.5%	84	90.5	140	926	7720	5570	72000	—	—	—
Gen Chem	E300	O-PO4	Orthophosphate	mg/L	—	—	85	12.9%	11	0.26	4.5	12	1110	70.8	11600	—	—	—
Gen Chem	E300	14808-79-8	Sulfate	mg/L	—	—	89	97.8%	87	169	912	3410	20400	41100	89900	—	—	—
Gen Chem	E376.1	18496-25-8	Sulfide	mg/L	—	—	49	12.2%	6	0.4	2.95	5	4.25	5.43	6.1	—	—	—
Gen Chem	E351.2	TKN	Total Kjeldahl nitrogen	mg/L	—	—	71	77.5%	55	0.1	0.6	1.7	3.63	4.6	18.4	—	—	—
Metals	SW6020	7440-70-2	Calcium	µg/L	—	—	88	100%	88	21200	105000	478000	367000	512000	616000	—	—	—
Metals	SW6020	9/7/7440	Potassium	µg/L	—	—	88	100%	88	8850	21500	167000	3160000	4600000	16700000	—	—	—
Metals	SW6020	7440-23-5	Sodium	µg/L	—	—	88	100%	88	152000	227000	928000	5150000	48600000	378000000	—	—	—
Rads	Tracer Analysis	Delta-D	Delta-D	Pct	—	—	2	100%	2	69.7	—	85.2	85.2	—	100.6	—	—	—
Water Quality	E310.1	Q017	Bicarbonate alkalinity	mg/L	—	—	91	96.7%	88	8	50	70.5	77.4	96.2	208	—	—	—
Water Quality	E310.1	Q022	Carbonate alkalinity	mg/L	—	—	91	7.7%	7	8	8	14	84	106	386	—	—	—
Water Quality	E120.1	Q181	Conductivity	µmhos/cm	—	—	76	100%	76	321	1840	5930	25400	36200	137000	—	—	—
Water Quality	E130.2	Q1925	Hardness	mg/L	—	—	73	100%	73	40	355	2000	39300	21400	1990000	—	—	—
Water Quality	E310.1	Q021	Hydroxide alkalinity	mg/L	—	—	91	6.6%	6	4	4	5	252	485	1270	—	—	—
Water Quality	SW9040	PH	pH	none	—	—	73	100%	73	5.8	7.25	7.6	7.66	7.9	12.1	—	—	—
Water Quality	E310.1	471-34-1	Total alkalinity	mg/L	—	—	81	100%	81	16	49.5	71	77.5	99.9	208	—	—	—
Water Quality	E415.1	Q129	Total inorganic carbon	mg/L	—	—	72	56.9%	41	0.23	11.9	17.7	20.9	28.1	65.4	—	—	—
Water Quality	E415.1	TOC	Total organic carbon	mg/L	—	—	73	47.9%	35	0.27	1.2	4.3	321	11.4	3690	—	—	—
Water Quality	E160.2	Q595	Total suspended solids	mg/L	—	—	73	97.3%	71	1	7	23	155	116	3830	—	—	—

FOD = Frequency of detection

MCL = U.S. EPA Maximum Contaminant level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

µmhos/cm = Micromhos per centimeter

— = BCL or MCL not defined

Table 8. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Shallow Zone – Eastside-Hook Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	2070	517.50	No	Gen Chem	E300.0	Yes	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Perchlorate	µg/L	—	18	4040	224.44	Yes	Gen Chem	E314.0/SW6850	Yes	Widespread detections-off-site source
Nitrite	mg/L	1	1	54.5	54.50	No	Gen Chem	E300	Yes	Detections >BCL in 2007 only, thereafter not detected
alpha-BHC	µg/L	—	0.011	0.214	19.45	Yes	OCPs	SW8081	Yes	Widespread detections > BCL; off-site source
Chloroform	µg/L	—	1.6	22.1	13.81	Yes	VOCs	SW8260	Yes	Widespread detections > BCL; off-site source
beta-BHC	µg/L	—	0.037	0.511	13.81	Yes	OCPs	SW8081	Yes	Widespread detections > BCL; off-site source suspected; most values <1
Arsenic	µg/L	10	10	84.7	8.47	Yes	Metals	SW6020	Yes	Widespread detections > BCL; off-site source
Total dissolved solids	mg/L	500	—	4100	8.20	Yes	Water Quality	E160.1	Yes	Widespread detections > MCL; off-site source
Lithium	µg/L	—	73	264	3.62	Yes	Metals	SW6020	Yes	Widespread detections > BCL, mostly >100 µg/L
Ammonia	µg/L	—	200	716	3.58	No	Gen Chem	E350.1	No	Mostly in Hook area near Tronox pumping system; possibly occurring via organic degradation
Manganese	µg/L	—	510	785	1.54	No	Metals	SW6020	Yes	Potentially naturally occurring; Deep zone connectivity limited (DBS&A, 2010a)
Nitrate	mg/L	10	10	15.3	1.53	Yes	Gen Chem	E300	Yes	Widespread Eastside and Hook area detections
Uranium	µg/L	30	30	31.6	1.05	Yes	Metals	SW6020	Yes	Widespread detections > BCL, some only nominally
Cobalt	µg/L	—	11	9.85	0.90	No	Metals	SW6020	Yes	Mostly detected near Tronox pumping system (PC-79, PC-80); possibly due to nearby treatment system with low dissolved oxygen
Magnesium	µg/L	—	207000	169000	0.82	Yes	Metals	SW6020	Yes	Several detections>BCL; off-site source
Selenium	µg/L	50	50	36.8	0.74	Yes	Metals	SW6020	Yes	Values >BCL isolated along North Pabco Rd and Hook area (Layer 1); one flux line well > BCL in Layer 2
Molybdenum	µg/L	—	180	106	0.59	Yes	Metals	SW6020	Yes	Detections consistently > BCL in Hook area wells PC-2, PC-4
Chromium (VI)	µg/L	100	100	44.7	0.45	No	Metals	SW7196	No	Primarily detected off-site; one Hook area detection > BCL (PC-2 210 µg/L) in 2006; PC-2 7.7 µg/L in 2009
Chromium (total)	µg/L	100	100	43	0.43	No	Metals	SW6020	Yes	Primarily detected off-site; well PC-4 >BCL (111 µg/L) in 2006; 89.5 µg/L in 2009
Strontium	µg/L	—	21900	8680	0.40	No	Metals	SW6020	Yes	Will be included in monitoring for other metals; no detections > BCL; low IP score; maximum detected concentration is 65% of BCL

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP Score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

OCP = Organochlorine pesticide

VOC = Volatile organic compounds

— = BCL or MCL not defined

Table 9. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Shallow Zone – Eastside-Main Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	2630	657.50	No	Gen Chem	E300.0	Yes	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Perchlorate	µg/L	—	18	5190	288.33	Yes	Gen Chem	E314.0/SW6850	Yes	Widespread detections-off-site source
Chloroform	µg/L	—	1.6	161	100.63	Yes	VOCs	SW8260	Yes	Major component of TTHM group; off-site source; on-site source near first 8 rows/flux line area; flux line impacts
Nitrite	mg/L	1	1	46.1	46.10	No	Gen Chem	E300	Yes	Detections >BCL in 2007 only, thereafter not detected
Total dissolved solids	mg/L	500	—	6470	12.94	Yes	Water Quality	E160.1	Yes	Widespread detections > MCL; off-site source
Lithium	µg/L	—	73	657	9.00	Yes	Metals	SW6020	Yes	Widespread detections > BCL, mostly >100 µg/L, up to 5,980 µg/L (MCF-6B)
alpha-BHC	µg/L	—	0.011	0.0901	8.19	Yes	OCPs	SW8081	Yes	Widespread detections > BCL; off-site source
Arsenic	µg/L	10	10	71.1	7.11	Yes	Metals	SW6020	Yes	Widespread detections > BCL; off-site source
Bromodichloromethane	µg/L	—	1.1	5.6	5.09	No	VOCs	SW8260	Yes	Plume primarily off-site; relatively small component of TTHM group; will analyze with other VOCs
Nitrate	mg/L	10	10	21.6	2.16	Yes	Gen Chem	E300	Yes	Widespread Eastside detections
Total trihalomethanes	µg/L	80	—	154	1.925	No	VOCs	—	Yes	Plume primarily off-site; will analyze with other VOCs
beta-BHC	µg/L	—	0.037	0.0676	1.83	Yes	OCPs	SW8081	Yes	Widespread detections > BCL; off-site source suspected; most values <1 µg/L
Magnesium	µg/L	—	207000	362000	1.75	Yes	Metals	SW6020	Yes	Off-site source; on-site source downgradient of first 8 rows
Molybdenum	µg/L	—	180	200	1.11	Yes	Metals	SW6020	Yes	Historically stable or increasing concentrations; some isolated impacts in flux line area
Chromium (total)	µg/L	100	100	105	1.05	No	Metals	SW6020	Yes	Plume primarily off-site. On-site detections isolated and nominally > BCL. SE area near off-site source
Tetrachloroethene	µg/L	5	5	5.1	1.02	No	VOCs	SW8260	Yes	Plume primarily off-site. Only on-site detections > BCL near off-site source in SE Eastside area
Chromium (VI)	µg/L	100	100	90.3	0.90	No	Metals	SW7196	No	Plume primarily off-site. On-site detections isolated and nominally > BCL. SE area near off-site source
Uranium	µg/L	30	30	26.4	0.88	Yes	Metals	SW6020	Yes	Widespread detections > BCL, some only nominally
Carbon tetrachloride	µg/L	5	5	4.36	0.87	Yes	VOCs	SW8260	Yes	On-site 2x BCL near and downgradient of first 8 rows (BEC-6/flux line area); off-site source near Southeast Eastside area
Selenium	µg/L	50	50	32.9	0.66	Yes	Metals	SW6020	Yes	Values >BCL isolated along North Pabco Rd and Hook area (Layer 1); one flux line well > BCL in Layer 2

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

OCP = Organochlorine pesticide

VOC = Volatile organic compounds

— = BCL or MCL not defined

Table 10. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Middle Zone – Eastside-Hook Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	9480	2370.00	No	Gen Chem	E300.0	No	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Lithium	µg/L	—	73	4590	62.88	No	Metals	SW6020	Yes	Naturally occurring (USGS, 2010); Retained as monitoring parameter
Total dissolved solids	mg/L	500	—	11600	23.20	No	Water Quali	E160.1	No	Naturally occurring (DBS&A, 2010a)
Ammonia	µg/L	—	200	1850	9.25	No	Gen Chem	E350.1	No	Likely naturally occurring; deep borings in this area indicate presence of decaying organic matter
Magnesium	µg/L	—	207000	1220000	5.89	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter
beta-BHC	µg/L	—	0.037	0.078	2.11	No	OCPs	SW8081	No	Plume primarily off-site; one detection > BCL
Manganese	µg/L	—	510	860	1.69	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter
Molybdenum	µg/L	—	180	301	1.67	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter
Arsenic	µg/L	10	10	14.5	1.45	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter; also naturally occurring component
Perchlorate	µg/L	—	18	21.3	1.18	No	Gen Chem	E314.0/SW68	No	Plume primarily off-site; One detection > BCL in Hook Area well in 2004 (MCF-10B @ 167 ug/L; Not detected or < BCL thereafter).
Beryllium	µg/L	4	4	3.5	0.88	No	Metals	SW6020	Yes	Low IP score; only one detection and <BCL
Chromium (total)	µg/L	100	100	50.4	0.50	No	Metals	SW6020	Yes	Plume primarily off-site; only one detection and <BCL
Boron	µg/L	—	7300	3390	0.46	No	Metals	SW6020	Yes	Low IP score; one detection >BCL
Strontium	µg/L	—	21900	9600	0.44	No	Metals	SW6020	Yes	Low IP score; no detections > BCL
Chromium (VI)	µg/L	100	100	39	0.39	No	Metals	SW7196	No	Low IP score; low FOD; no detections > BCL
Cadmium	µg/L	5	5	1.39	0.28	No	Metals	SW6020	Yes	Low IP score; low FOD; no detections > BCL
Chloroform	µg/L	—	1.6	0.44	0.28	No	VOCs	SW8260	No	Plume primarily off-site; low IP score; no detections > BCL
Cobalt	µg/L	—	11	1.96	0.18	No	Metals	SW6020	Yes	Low IP score; low FOD; no detections > BCL
Selenium	µg/L	50	50	8.1	0.16	No	Metals	SW6020	Yes	Low IP score; no detections > BCL; maximum detection is approximately 25% of BCL
Fluoride	mg/L	4	4	0.441	0.11	No	Gen Chem	E300	No	Low IP score; no detections > BCL; maximum detection is less than 25% of BCL

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

OCP = Organochlorine pesticide

VOC = Volatile organic compounds

FOD = Frequency of detection

— = BCL or MCL not defined

Table 11. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Middle Zone – Eastside-Main Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	12400	3100.00	No	Gen Chem	E300.0	No	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Lithium	µg/L	—	73	7130	97.67	No	Metals	SW6020	Yes	Naturally occurring (USGS, 2010); Retained as monitoring
Total dissolved solids	mg/L	500	—	33700	67.40	No	Water Quality	E160.1	No	Naturally occurring (DBS&A, 2010a)
Perchlorate	µg/L	—	18	712	39.56	Yes	Gen Chem	E314.0/SW6850	Yes	Plume primarily off-site; 10,800 ug/L in MCF-16B (2004): not detected thereafter
Ammonia	µg/L	—	200	3700	18.50	No	Gen Chem	E350.1	No	Likely naturally occurring; deep borings in this area indicate presence of decaying organic matter
Nitrite	mg/L	1	1	16.5	16.50	No	Gen Chem	E300	No	Two Main Area detections in 2007 only (other 2 near Las Vegas Wash); not detected thereafter, some DLs>BCL; rapidly transforms to nitrate
Magnesium	µg/L	—	207000	3010000	14.54	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter
Lead	µg/L	15	15	201	13.40	No	Metals	SW6020	Yes	Two detections > BCL in MCF-05 (2004, 2007); not detected thereafter; retained as monitoring parameter
Arsenic	µg/L	10	10	42.7	4.27	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter; also naturally occurring component
Chloroform	µg/L	—	1.6	5.45	3.41	No	VOCs	SW8260	No	Plume primarily off-site; 2 of 45 detections > BCL
Molybdenum	µg/L	—	180	424	2.36	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter; relatively low IP score
Manganese	µg/L	—	510	849	1.66	No	Metals	SW6020	Yes	Plume primarily off-site; retained as monitoring parameter
Selenium	µg/L	50	50	49.7	0.99	No	Metals	SW6020	Yes	Low IP score; 2 of 45 detections > BCL
Beryllium	µg/L	4	4	3.66	0.92	No	Metals	SW6020	Yes	Low IP score; 1 of 45 detections > BCL
Nitrate	mg/L	10	10	6.78	0.68	No	Gen Chem	E300	No	Low IP score; 1 of 26 detections > BCL in MCF-05 at 141 J- ug/L (2007)
Chromium (Total)	µg/L	100	100	48.7	0.49	No	Metals	SW6020	Yes	Plume primarily off-site; 1 of 9 detections >BCL; MCF-16B at 237 ug/L (2004); not detected > BCL in 2009; low IP score
Boron	µg/L	—	7300	3220	0.44	No	Metals	SW6020	Yes	Low IP score; 7 of 41 detections >BCL; MCF-16B (7,740 ug/L) and MCF-05 (8,130 ug/L) only nominally>BCL (2009); other detections near Las Vegas Wash
Chromium (VI)	µg/L	100	100	36.4	0.36	No	Metals	SW7196	No	Plume primarily off-site; 1 of 19 detections > BCL in MCF-16B at 280 ug/L (2004); Not detected in 2009
Chlorite	µg/L	1000	—	319	0.32	No	Gen Chem	EPA 300.1	No	No detections > MCL; low IP score
Strontium	µg/L	—	21900	6470	0.30	No	Metals	SW6020	Yes	No detections > BCL; low IP score

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

OCP = Organochlorine pesticide

VOC = Volatile organic compounds

DL = Detection limit

— = BCL or MCL not defined

Table 12. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Deep Zone – Eastside-Hook Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	102000	25500.00	No	Gen Chem	E300.0	No	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Thallium	µg/L	2	2	1020	510.00	No	Metals	SW6020	Yes	2 of 21 samples > BCL (2004,06); 2009 data < BCL; retained as monitoring parameter
Lithium	µg/L	—	73	30700	420.55	No	Metals	SW6020	Yes	Naturally occurring (USGS, 2010); Retained as monitoring parameter
Nitrite	mg/L	1	1	193	193.00	No	Gen Chem	E300	No	Few detections > BCL; 2009 data < BCL; rapidly transforms to nitrate
Ammonia	µg/L	—	200	6470	32.35	No	Gen Chem	E350.1	No	Likely naturally occurring; deep borings in this area indicate presence of decaying organic matter
Magnesium	µg/L	—	207000	3150000	15.22	No	Metals	SW6020	Yes	Naturally occurring (DBS&A, 2010a); retained as monitoring parameter
Selenium	µg/L	50	50	347	6.94	No	Metals	SW6020	Yes	2 of 21 detections > BCL
Fluoride	mg/L	4	4	19.3	4.83	No	Gen Chem	E300	No	MCF-08A > BCL in 2006; not detected thereafter
Tungsten	µg/L	—	270	946	3.50	No	Metals	SW6020	Yes	MCF-08A > BCL in 2006; not detected thereafter
Arsenic	µg/L	10	10	34.6	3.46	No	Metals	SW6020	Yes	Off-site source; retained as monitoring parameter; also naturally occurring component
Lead	µg/L	15	15	49.2	3.28	No	Metals	SW6020	Yes	2 of 20 samples >BCL; not detected in 2009 with lower detection limit
Cadmium	µg/L	5	5	12	2.40	No	Metals	SW6020	Yes	One detection > BCL in 2007; thereafter < BCL or not detected; low IP score
Boron	µg/L	—	7300	17200	2.36	No	Metals	SW6020	Yes	Low IP score; likely naturally occurring and related to paleoevaporite deposit (DBS&A, 2010a)
Cobalt	µg/L	—	11	21.1	1.92	No	Metals	SW6020	Yes	Low IP score; one detection >BCL (2007); other data not detected or < BCL
Molybdenum	µg/L	—	180	281	1.56	No	Metals	SW6020	Yes	Low IP score; retained as monitoring parameter
Manganese	µg/L	—	510	640	1.25	No	Metals	SW6020	Yes	Low IP score; retained as monitoring parameter
Strontium	µg/L	—	21900	21200	0.97	No	Metals	SW6020	Yes	Low IP score; retained as monitoring parameter
Uranium	µg/L	30	30	20.5	0.68	No	Metals	SW6020	Yes	Low IP score; retained as monitoring parameter
Chloroform	µg/L	—	1.6	0.635	0.40	No	VOCs	SW8260	No	Low IP score; only 2 detections (<1 ug/L) <BCL; common lab contaminant
Perchlorate	µg/L	—	18	7.04	0.39	No	Gen Chem	E314.0/SW6850	Yes	Low IP score; no detections > BCL; retained as monitoring parameter

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

OCP = Organochlorine pesticide

VOC = Volatile organic compounds

— = BCL or MCL not defined

Table 13. BRC Groundwater Monitoring Data 2004-2009
Indicator Parameter and Monitoring Parameter Selection
Deep Zone – Eastside-Main Area

Compound	Units	MCL	BCL	Mean	IP Score	Indicator Parameter?	Class	Method	Monitoring Parameter?	Basis
Chlorine	mg/L	4	4	16500	4125.00	No	Gen Chem	E300.0	No	Reported by laboratory as 2 x [Cl-], not reactive chlorine and not actually measured on-site
Nitrite	mg/L	1	1	201	201.00	No	Gen Chem	E300	No	3 of 80 detections>BCL; rapidly transforms to nitrate; 2009 data not detected
Lithium	µg/L	—	73	8350	114.38	No	Metals	SW6020	Yes	Naturally occurring (USGS, 2010); Retained as monitoring parameter
Total dissolved solids	mg/L	500	—	34700	69.4	No	Water Quality	E160.1	No	Naturally occurring (DBS&A, 2010a)
Ammonia	µg/L	—	200	4430	22.15	No	Gen Chem	E350.1	No	Likely naturally occurring; deep borings in this area indicate presence of decaying organic matter
Magnesium	µg/L	—	207000	3330000	16.09	No	Metals	SW6020	Yes	Naturally occurring (DBS&A, 2010a); retained as monitoring parameter
Nitrate	mg/L	10	10	94	9.40	No	Gen Chem	E300	No	Only 1 of 26 detections > BCL (MCF-03A, 2007); 2009 data < BCLs; potential transformation of ammonia
Molybdenum	µg/L	—	180	657	3.65	No	Metals	SW6020	Yes	Potentially naturally occurring; deep zone connectivity limited (DBS&A, 2010a)
Thallium	µg/L	2	2	7.3	3.65	No	Metals	SW6020	Yes	Few detections > BCL 2004-07; 2009 data < BCL
Arsenic	µg/L	10	10	21.6	2.16	No	Metals	SW6020	Yes	Detections nominally > BCL; potentially naturally occurring
Manganese	µg/L	—	510	938	1.84	No	Metals	SW6020	Yes	Potentially naturally occurring; Deep zone connectivity limited (DBS&A, 2010a)
Beryllium	µg/L	4	4	5.7	1.43	No	Metals	SW6020	No	Low IP score; three detections > BCL 2004-07; 2009 data not detected
Chlorite	µg/L	1000	—	1250	1.25	No	Gen Chem	EPA 300.1	No	Low IP score; 1 of 78 detections > MCL (no BCL) (analysis repeated)
Lead	µg/L	15	15	18.2	1.21	No	Metals	SW6020	Yes	Low IP score; Two detections > BCL 2004-06; One 2009 detection (0.26 µg/L MCF-03A) < BCL
Chromium (total)	µg/L	100	100	87.7	0.88	No	Metals	SW6020	Yes	Low IP score; One well > BCL (MCF-03A 138-944 J+ µg/L 2006-09); others not detected or < BCL
Antimony	µg/L	6	6	5.07	0.85	No	Metals	SW6020	Yes	Low IP score; Three detections > BCL 2004-07; 2009 data not detected
Cadmium	µg/L	5	5	3.3	0.66	No	Metals	SW6020	Yes	Low IP score; Three detections > BCL 2007; 2009 data < BCL
Boron	µg/L	—	7300	4720	0.65	No	Metals	SW6020	Yes	Low IP score; Mean detected concentration < BCL; potentially naturally occurring and related to paleoevaporite deposit (DBS&A, 2010a)
Selenium	µg/L	50	50	29.5	0.59	No	Metals	SW6020	Yes	Low IP score; Two detections> BCL 2009; others < BCL or not detected; potentially naturally occurring
Cobalt	µg/L	—	11	5.08	0.46	No	Metals	SW6020	Yes	Low IP score; 2009 data < BCL
Chromium (VI)	µg/L	100	100	31.6	0.32	No	Metals	SW7196	No	Low IP score; No detections > BCL
Perchlorate	µg/L	—	18	5.52	0.31	No	Gen Chem	E314.0/SW6850	Yes	Low IP score; Possible field sample contamination

MCL = U.S. EPA Maximum Contaminant Level

BCL = Basic Comparison Level

IP score = Indicator Parameter Score (Mean/BCL or Mean/MCL if BCL is not defined)

mg/L = Milligrams per liter

µg/L = Micrograms per liter

Gen Chem = General Chemistry

VOC = Volatile organic compounds

— = BCL or MCL not defined

Attachment 1

Response to Comments

Response to Nevada Division of Environmental Protection Comments, dated September 1, 2010, regarding Indicator Parameter Selection, BMI Common Areas (Eastside-Main and Eastside-Hook Area), Clark County, Nevada, dated August 18, 2010, NDEP Facility ID#: H-000688

1. General comments, NDEP provides the following general comments:

- a. In many instances BRC references USEPA, 1988 when in fact the reference should be to USEPA, 1986. NDEP requests that BRC review and correct each of the citations, as necessary. This comment will not be repeated for each instance.

Response: The references will be revised as needed.

- b. This Deliverable and the review of this Deliverable would be greatly aided by concentration contour maps for each compound in each water-bearing zone. Due to the voluminous nature of these maps it is suggested that these only be provided in an electronic format. The number of maps can be reduced through some form of screening criteria. Please consult with NDEP for discussion on this item.

Response: BRC will provide electronic copies of selected contour maps in each water-bearing zone after discussion with NDEP. The contour maps have been updated to include data reference information and BCL/MCL contour lines.

- c. Specific uses need to be proposed for indicator parameter selection as none were listed in the Introduction and Objectives section. For example, the objectives (discussed in the Conclusions section) could provide focus on the analyte list for one or more of the following:
 - i. Future groundwater monitoring analyte list
 - ii. Future groundwater monitoring reporting;
 - iii. Eastside conceptual site model (CSM); and
 - iv. Groundwater remedial alternative study (RAS) including:
 1. Remedial Action Objectives
 2. Remedial Technology Selection
 3. Remedial Technology Design

Response: The Introduction and Objectives section will be revised to include proposed specific uses for the selected indicator parameters.

- d. It appears that BRC used the data from all wells sampled regardless of their location. The NDEP notes that given the potential intended use of the indicator parameters not all wells provide relevant comparison. There should be a figure showing: 1) all wells sampled and 2) those wells within the Eastside Area (former Upper and lower Ponds Areas). Wells not included within the latter should not be included in the indicator parameter selection. Also, the upgradient wells should be removed from the data set as they are to be used for the “background” comparison discussed below.

Response: Upgradient wells and wells outside of the Eastside Area (offsite wells) will be removed from the data set screened for indicator parameter selection. In addition, maps will be provided that show both on-site and off-site wells that have been sampled.

- e. In Step 1 (USEPA, 1986) chemicals with maximum concentrations below either its NDEP BCL or USEPA MCL should be listed in a separate Table. Chemicals that do not have either a BCL or MCL should be listed in a separate Table.

Response: Tables will be prepared to show detected parameters that were below BCLs/MCLs or have no BCL or MCL.

- f. If a chemical or class of chemicals is considered important in terms of developing the CSM and/or evaluating remedial alternatives, then that chemical or class of chemicals should be included as an indicator parameter.

Response: BRC considered these criteria in developing the proposed IP list. This will be clarified in the revised technical memorandum.

- g. BRC should keep in mind that the overall objective for developing indicator parameters is to develop a list of parameters sufficient to meet the stated objectives. For example, a chemical below its BCL or MCL but frequently detected could have impact on the CSM or remedial alternative evaluation.

Response: Comment noted. BRC considered these criteria in developing the proposed IP list and this will be clarified in the revised technical memorandum.

- 2. Page 2, Methods, item 3, NDEP notes that this item was not completed in the subject Deliverable and requests that BRC discuss why this was not completed.

Response: This step was not omitted. The scoring methodology in USEPA (1986; 1988) multiplies maximum or representative detected concentrations and a toxicity factor that is outdated. Updated toxicity data are embedded within the current BCL/MCL values, so BRC utilized these values for data screening.

- 3. Page 2, Methods, NDEP provides the following comments:
 - a. NDEP notes that BRC references a frequency of detection (FOD) of less than 5% as a screening tool. NDEP did not find any reference to this specific screening step in USEPA, 1988 USEPA, 1986. Please explain the basis for this.

Response: The concept of frequency of detection (FOD), and an example using an FOD of 5%, is presented in U.S. Environmental Protection Agency (USEPA), 1989, *Risk Assessment Guidance for Superfund*: Volume I—Human Health Evaluation Manual (Part A). Interim Final. Office of Emergency and Remedial Response, Washington, D.C. USEPA/540/1-89/002. December.

- b. Please note that NDEP is not opposed to utilizing FOD as a screening tool however, the geographic area must be in proportion to the distribution of contamination. As the Deliverable is written, NDEP is concerned that compounds are being screened out inappropriately. For example, PCE and TCE in the Shallow Zone; and the fact that all compounds were screened out of the Middle and Deep Zone. As noted above, concentration contours maps would be helpful in determining the appropriateness of the screening.

Response: Comment noted. Also, contour maps will be provided in electronic format as noted in response to comment 1b.

4. USEPA, 1986 specifically notes that a comparison to background concentrations be completed and any compound failing this comparison be carried forward. BRC has not done this. Please justify the elimination of this step.

Response: BRC conservatively assumed that the detected organic compounds have no naturally occurring background concentrations. Similarly, all detected inorganics were carried forward in the screening as a conservative measure. Both organic and inorganic detections in upgradient wells will be addressed with statistical analysis that will be detailed in a separate technical memorandum currently in preparation by BRC. This will be clarified in the revised technical memorandum.

5. Page 3, Methods, 2nd paragraph, BRC states “Compounds with detected concentrations below MCLs or BCLs, or those without an MCL or BCL, dropped out of the screening.” The NDEP does not concur with this process. A compound with detected concentrations, say marginally below either its BCL or MCL; but, with a high frequency of detection could be important to the CSM and/or groundwater RAS.

Response: BRC considered compounds with no BCLs/MCLs or those detected below BCLs/MCLs with a relatively high FOD. This will be clarified in the revised technical memorandum.

6. Page 3, Indicator Parameter Lists, 2nd paragraph, BRC states “Compounds with only one or a few isolated detections nominally greater than MCLs/BCLs were dropped out of the screening.” The NDEP does not concur with this process. Also, please identify these chemicals.

Response: These chemicals are listed in the revised tables. As discussed in the revised technical memorandum, IPs were selected according to IP score and other factors (i.e. plume shape) in accordance with USEPA guidance.

7. Page 3, Indicator Parameter Lists, BRC discusses that the screening process is detailed in Tables 1-3. These Tables detail why compounds were retained or screened out, however, not all compounds are included. NDEP requests that these tables address all compounds.

Response: The tables have been revised to include all compounds detected at a frequency of 5% or greater, including those without BCLs/MCLs.

8. Page 4, Discussion, 2nd paragraph, the fact that concentrations for certain chemicals are higher in groundwater in off-site areas is not relevant if these chemicals also occur on-site and are above a BCL or MCL; and/or if these chemicals could migrate on-site at concentrations above a BCL or MCL. Some of these compounds may be screened out via the “background” or “upgradient” comparison, however, that has not been completed yet.

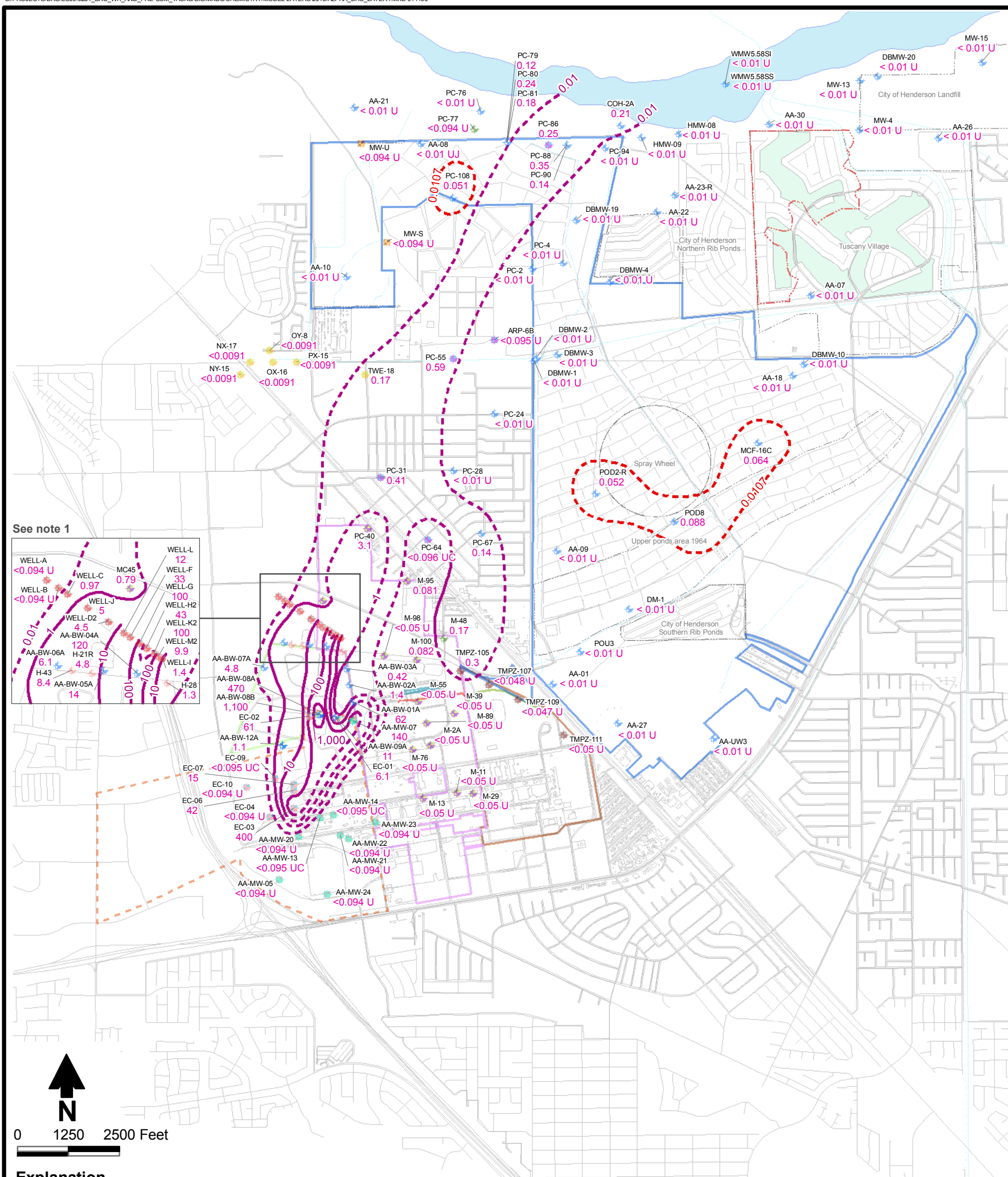
Response: Comment noted and agreed. As noted in the response to comment 4, detections in upgradient wells will be addressed with statistical analysis that will be detailed in a separate technical memorandum currently in preparation by BRC.

9. References, please indicate the approval status of each reference if the reference is a Deliverable that was submitted to NDEP.

Response: As available, BRC will provide this information as requested.

Attachment 2

Plume Maps for Selected Parameters



Explanation

Well Site - Date of Data

-  AMPAC - 2004
-  AMPAC - 2008
-  BRC - 2008
-  BRC - 2009
-  Kerr-McGee - 2008
-  Montrose - 2008
-  Montrose - 2009

- OSM - 2008
- Stauffer - 2009
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2006
- Tronox - 2008

-  Site boundary
-  Gravel pit circa 1976.
-  Source: Aerial photograph dated 1976
-  TIMET boundary
-  Tronox boundary
-  POSSM (The Companies)
-  Site AOC3 boundary
-  Las Vegas Wash

-  TIMET proposed slurry wall
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
-  BCL = 0.0107 ug/L

M-48	Monitoring well designation
0.17	Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. This parameter has no MCL
3. MCL = USEPA Maximum Contaminant Level
4. BCL = Basic Comparison Level
5. BCL = 0.0107 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Alpha BHC
Shallow Zone Layer 1



**Daniel B. Stephens
& Associates, Inc.**



Basic Remediation
C O M P A N Y

Prepared by:

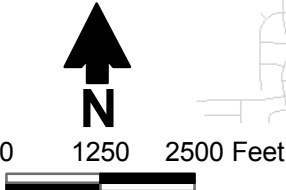
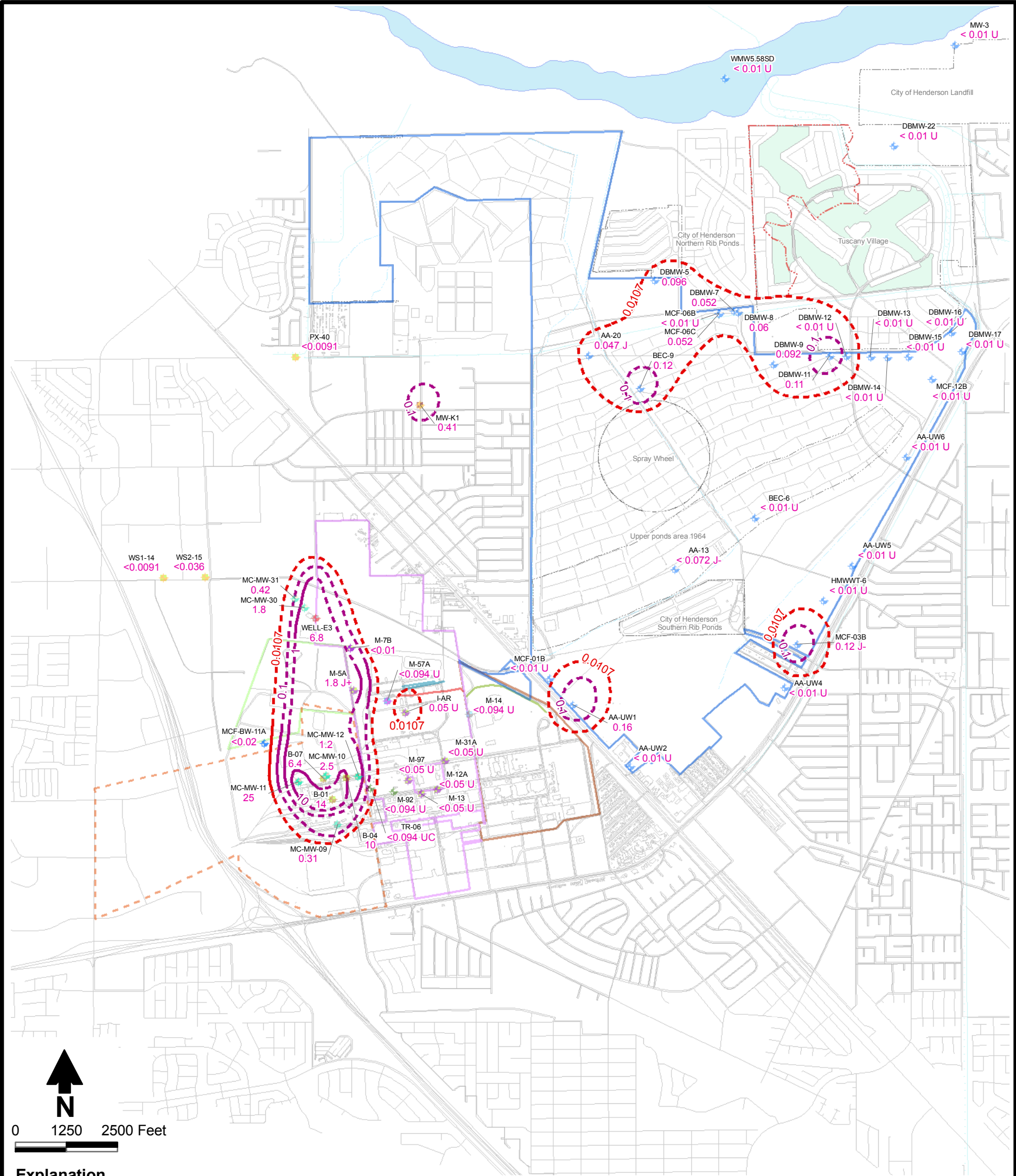


CRS

Date _____

09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ALPHA BHC_LAYER1.MXD 019040



Explanation

Well Site - Date of Data

- Site not known - 2008
- AMPAC - 2004
- AMPAC - 2008
- BRC - 2008
- BRC - 2009
- Kerr-McGee - 2008
- Montrose - 2008

M-10
620 Monitoring well designation
Result (ug/L)

- Montrose - 2009
- OSM Companies - 2008
- Olin - 2008
- Tronox - 2006
- Tronox - 2008
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph
dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)
- BCL = 0.0107 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 0.0107 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

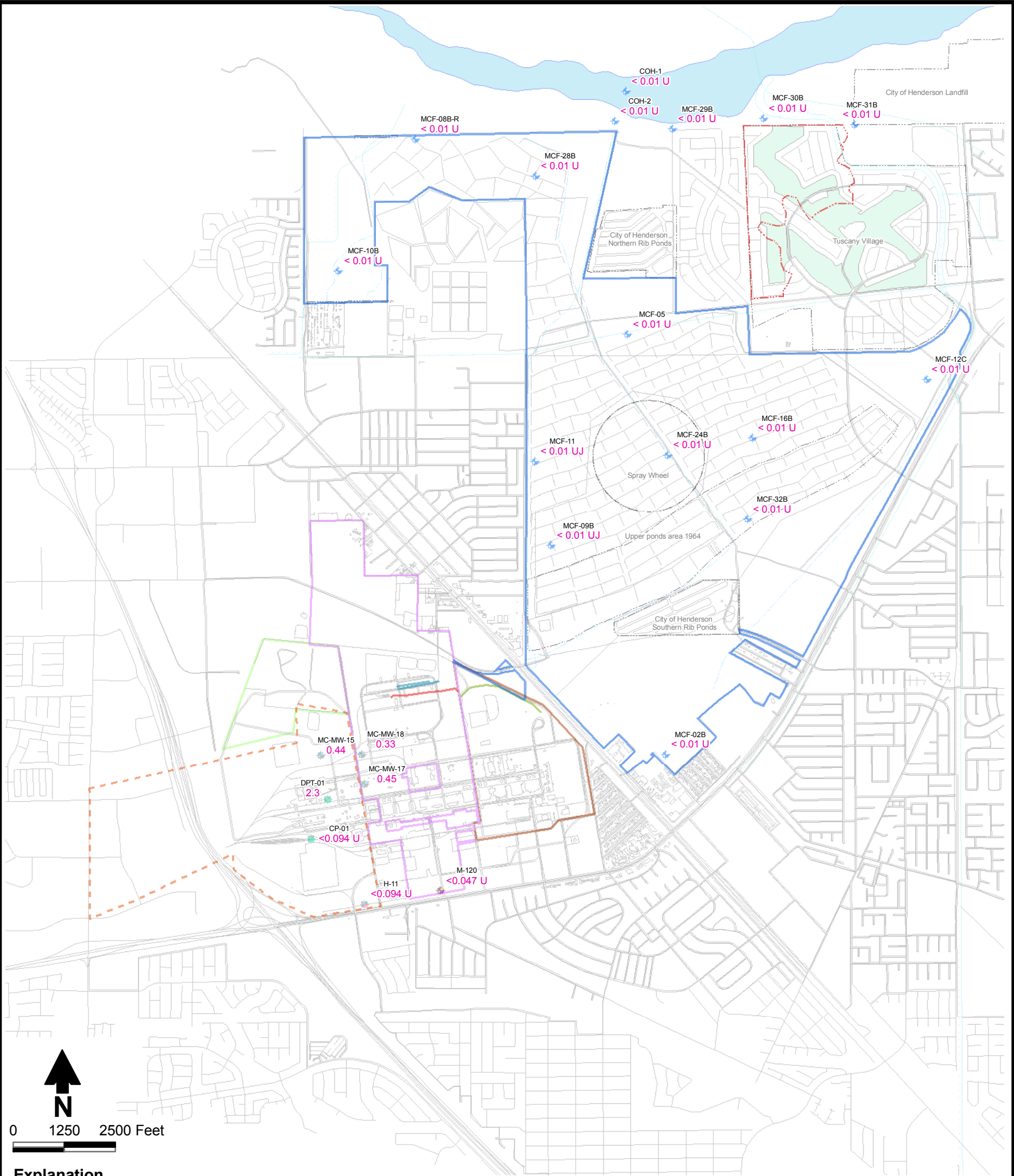
Alpha BHC
Shallow Zone Layer 2



Prepared by:
DBS&A CRS

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ALPHA_BHC_LAYER2.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2008
- BRC - 2009
- Montrose - 2008
- Stauffer - 2008
- Tronox- 2006
- Monitoring well designation
- Result (ug/L)

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street

References:

1. BRC, 2010
2. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 0.0107 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

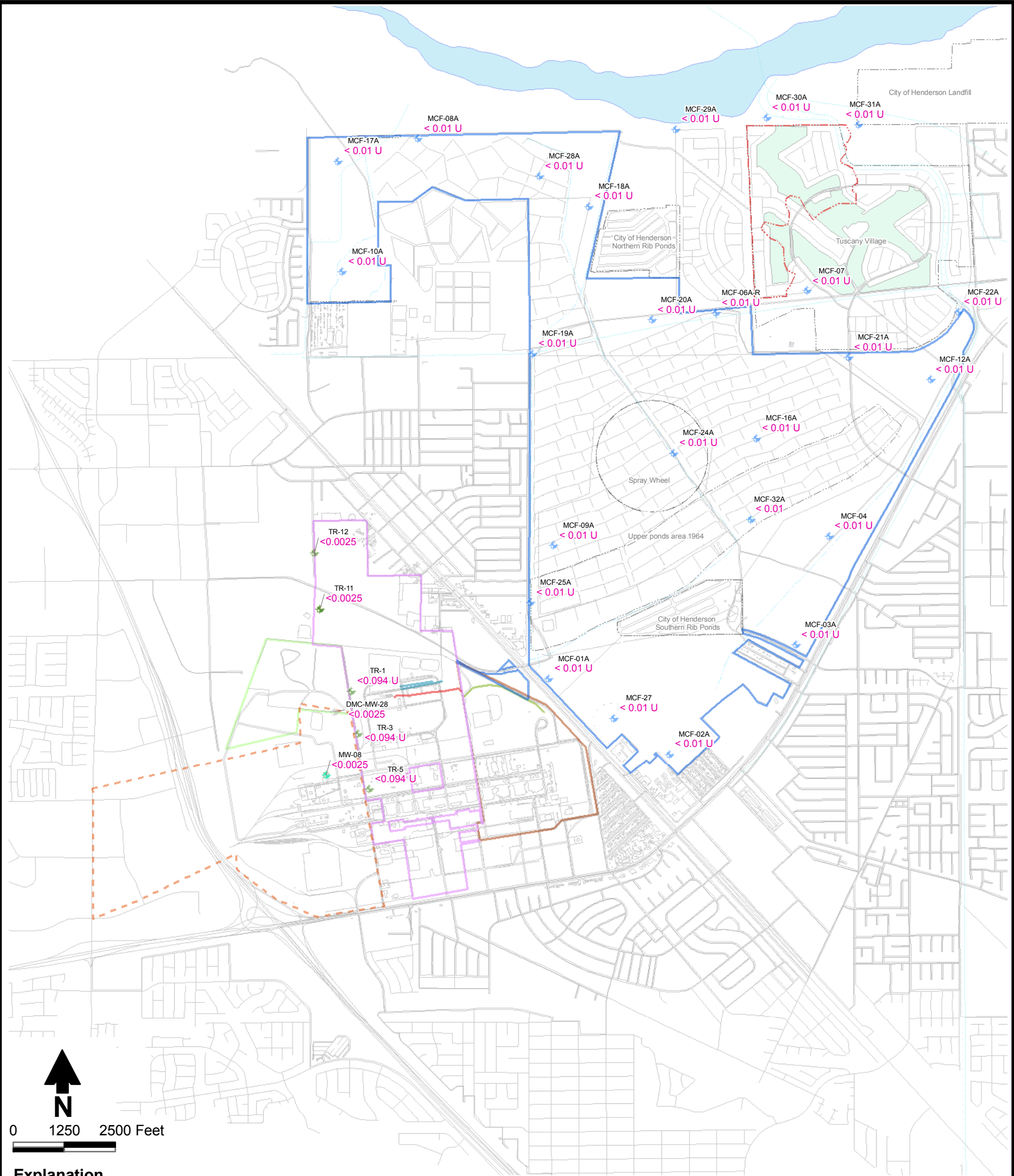
Alpha BHC
Middle Zone



Prepared by:
DBS&A CRS

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/Alpha_BHC_middle.MXD 019040



Explanation

Well Site - Date of Data

- Site not known - 2009
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2008
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 0.0107 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

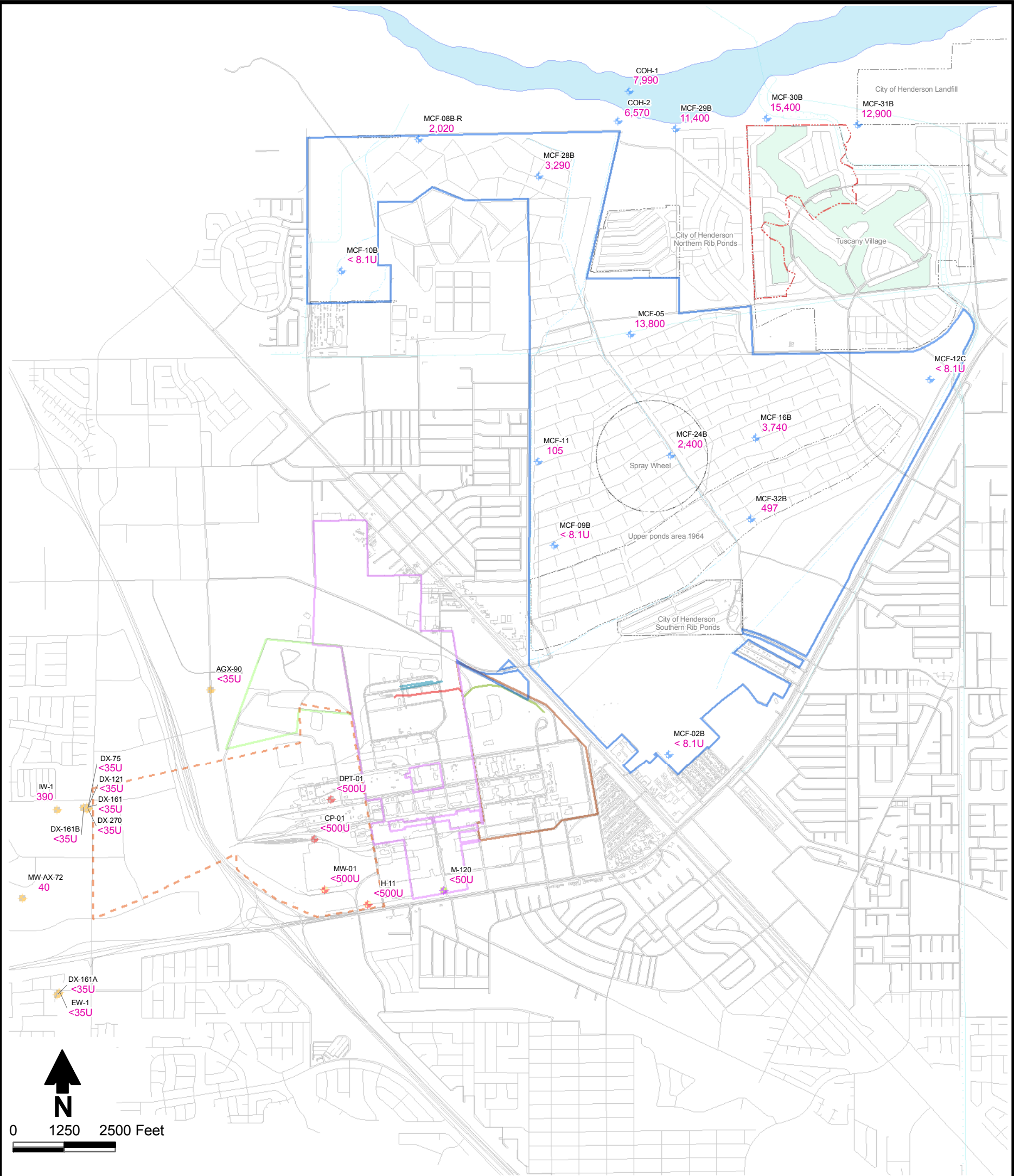
Alpha BHC
Deep Zone



Prepared by:
DBS&A CRS

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/Alpha_BHC_deep.MXD 019140



Explanation

Well Site - Date of Data

- AMPAC - 2005
- BRC - 2009
- POSSOM - 2006
- POSSOM - 2007
- TRONOX - 2006

H-11
<500U
Monitoring well designation
Result (ug/L)

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash
- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street

References:
1. BRC, 2010
2. NDEP, 2010

Notes:
1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 200 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

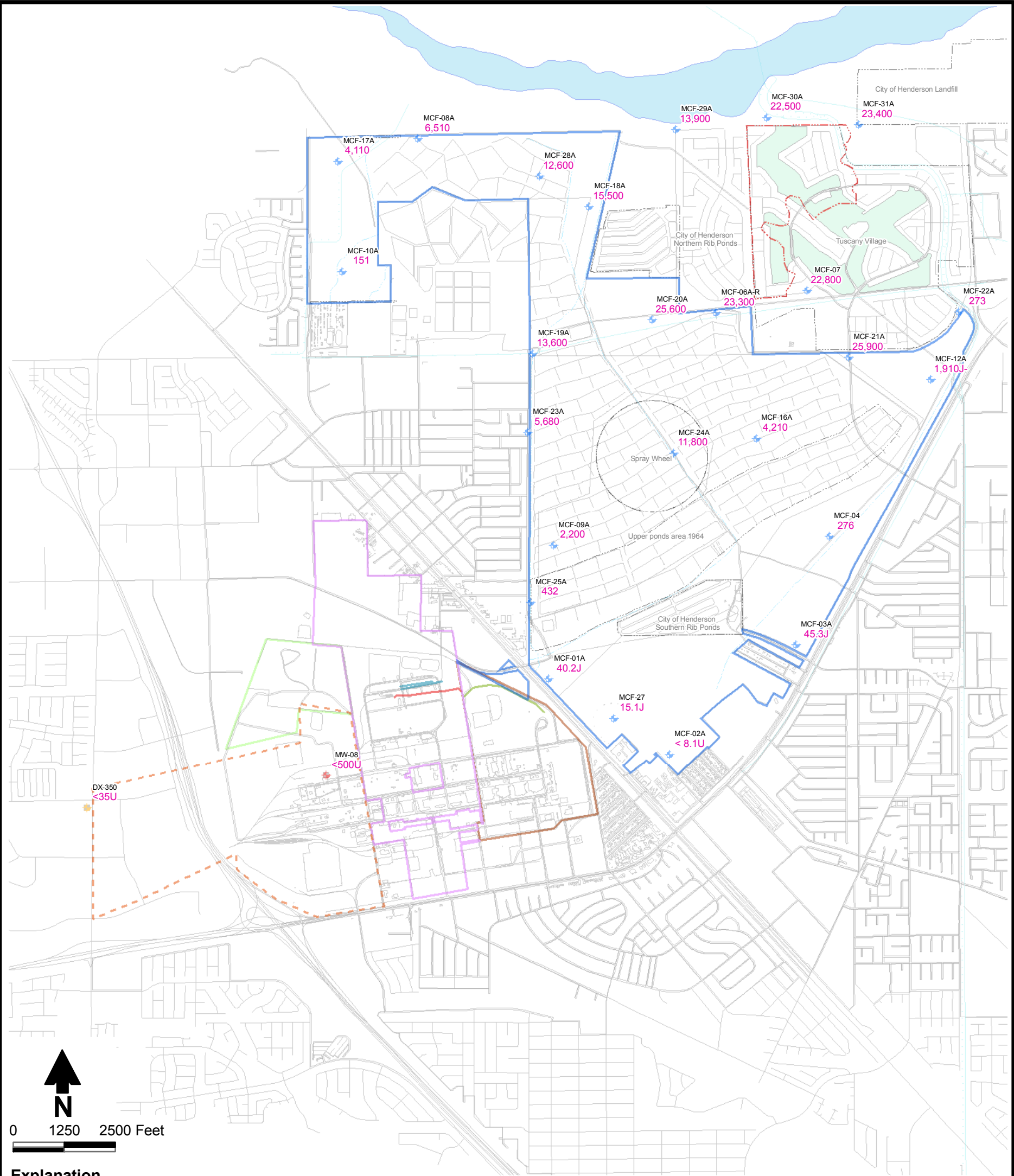
Ammonia
Middle Zone



Prepared by:
DBS&A CRS

Date
09-14-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\MO_mid.MXD 019040



Explanation

Well Site - Date of Data

AMPAC - 2005
Monitoring well designation
Result (ug/L)

BRC - 2009
POSSOM - 2006

Site boundary
Gravel pit circa 1976.
Source: Aerial photograph dated 1976
TIMET boundary
Tronox boundary
POSSM (The Companies)
Site AOC3 boundary
Las Vegas Wash

TIMET proposed slurry wall
September 2008
Tronox groundwater
recharge trench
Tronox slurry wall
Street

References:
1. BRC, 2010
2. NDEP, 2010

Notes:
1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 200 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

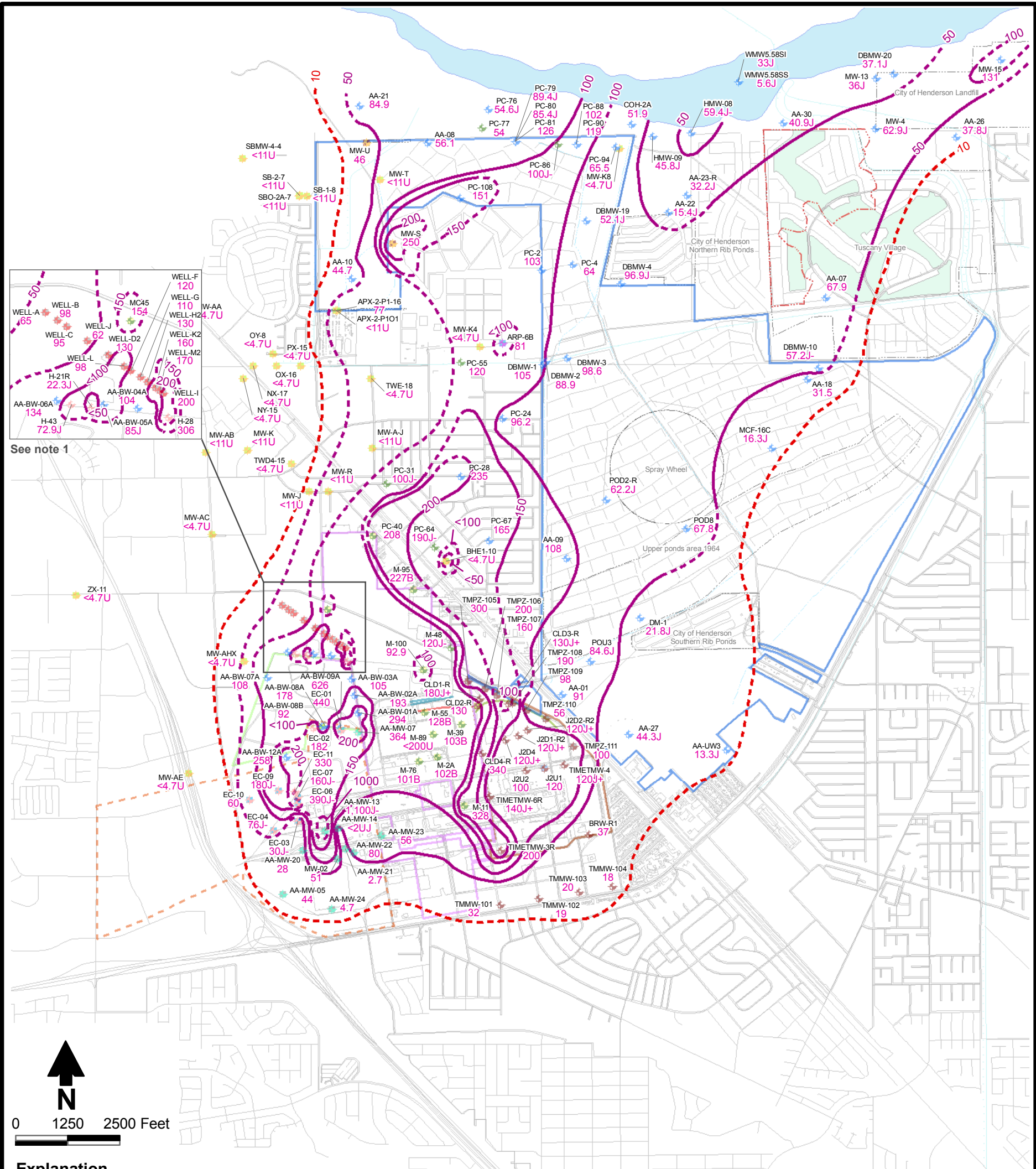
Ammonia
Deep Zone



Prepared by:
DBS&A CRS

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MO_mid.MXD 019040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2008
- BRC - 2008
- BRC - 2009
- Kerr-McGee - 2007
- Kerr-McGee - 2008
- Montrose - 2008
- Montrose - 2009
- Monitoring well designation
- Result (ug/L)

- OSM - 2008
- Stauffer - 2008
- Stauffer - 2009
- TIMET - 2006
- TIMET - 2007
- TIMET - 2008
- TIMET - 2009
- Tronox - 2008

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 10 ug/L
- BCL = 10 ug/L

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010
- TIMET, 2008a; TIMET,2008b; TIMET,2010

Notes:

- POSSM Groundwater Extraction/Air Stripping/Re-injection System.
- Data from 2004 not used for contouring.
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 10 ug/L
- BCL = 10 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Arsenic
Shallow Zone Layer 1

Prepared by:
DBS&A CRS

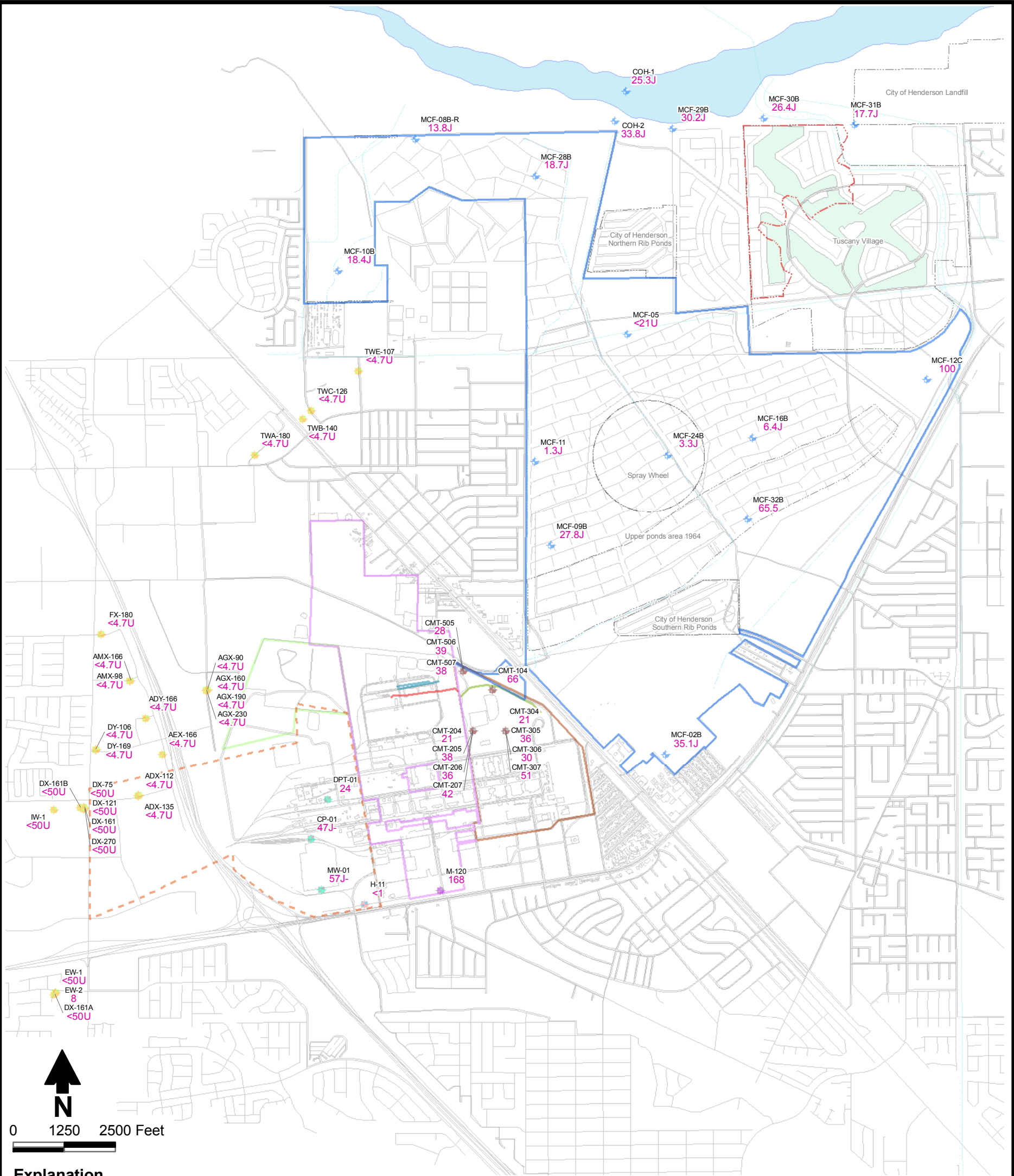
Date
09-14-10

Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/Arsenic_LAYER1.MXD 016040

BMI Common Areas (Eastside) Henderson, Nevada		
Arsenic Shallow Zone Layer 2		
<i>Daniel B. Stephens & Associates, Inc.</i>		Basic Remediation C O M P A N Y
DBS&A	Prepared by: CRS	Date: 09-14-10
S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\ARSENIC_LAYER2.MXD 016240		



Explanation

Well Site - Date of Data

- AMPAC - 2004
- BRC - 2009
- Montrose - 2008
- Stauffer, 2008
- TIMET - 2008
- Tronox, 2007

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 10 ug/L
4. BCL = 10 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

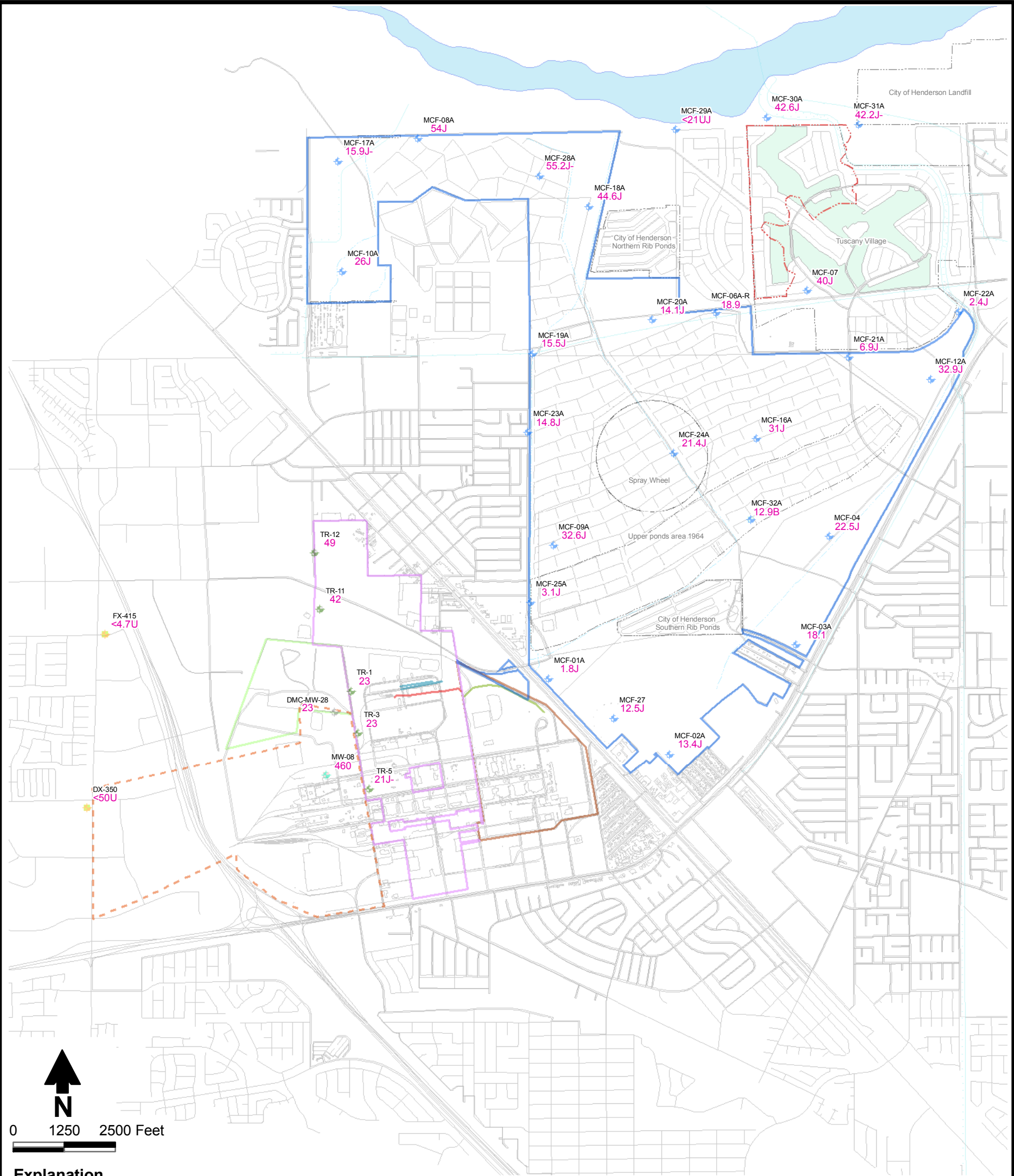
Arsenic
Middle Zone



Prepared by:
DBS&A CRS

Date
09-14-10

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Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2004
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 10 ug/L
4. BCL = 10 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Arsenic
Deep Zone

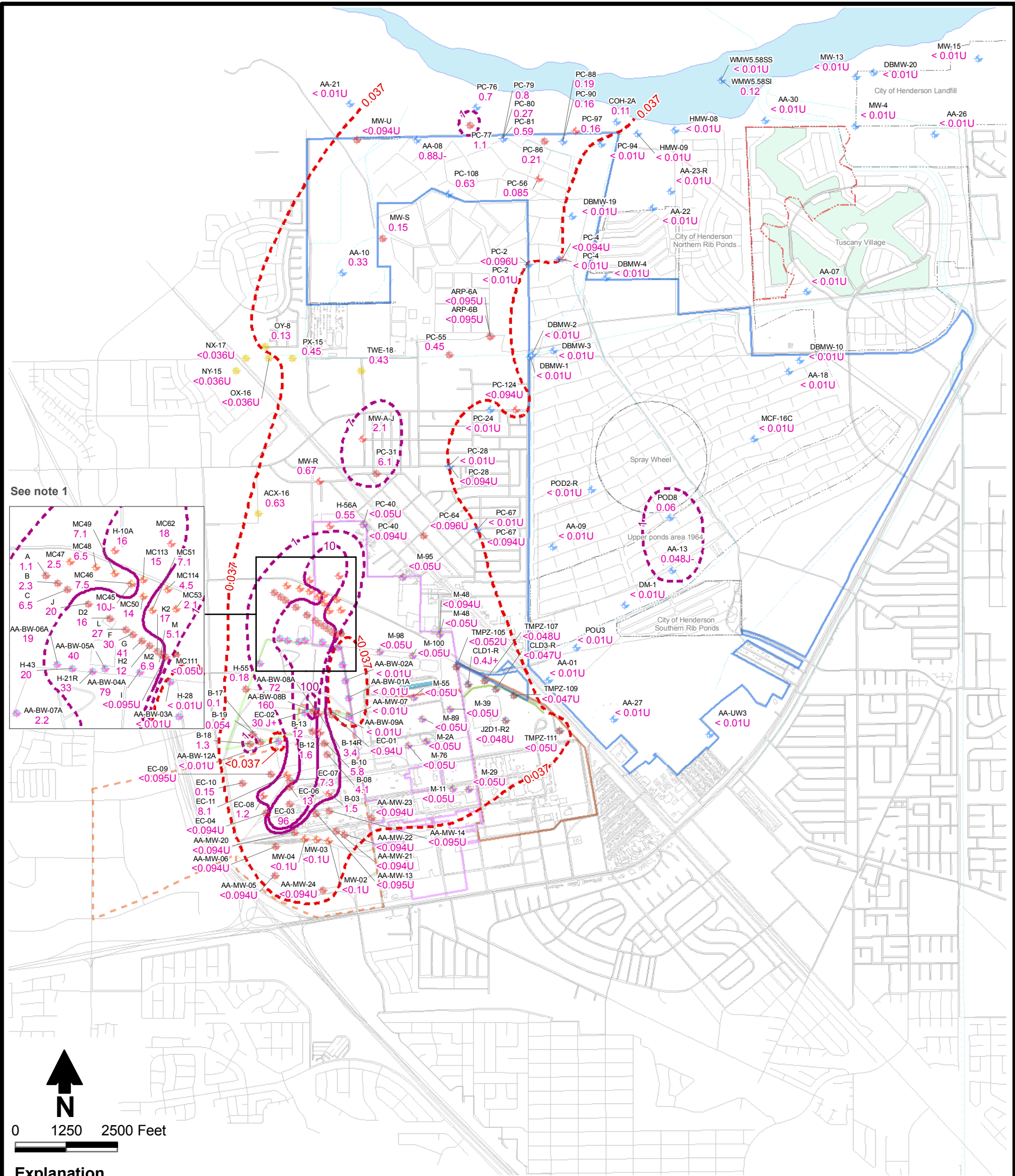
Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

Prepared by:
DBS&A CRS

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ARSENIC_DEEP.MXD 016040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- BRC - 2009
- CAMU - 2009
- POSSOM - 2005
- POSSOM - 2006
- POSSOM - 2007
- POSSOM - 2008
- POSSOM - 2009
- TIMET - 2006
- TIMET - 2008
- TRONOX - 2006

M-29
<0.05U
Monitoring well designation
Result (ug/L)

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)
- BCL = 0.037 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. This parameter has no MCL
3. MCL = USEPA Maximum Contaminant Level
4. BCL = Basic Comparison Level
5. BCL = 0.037 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

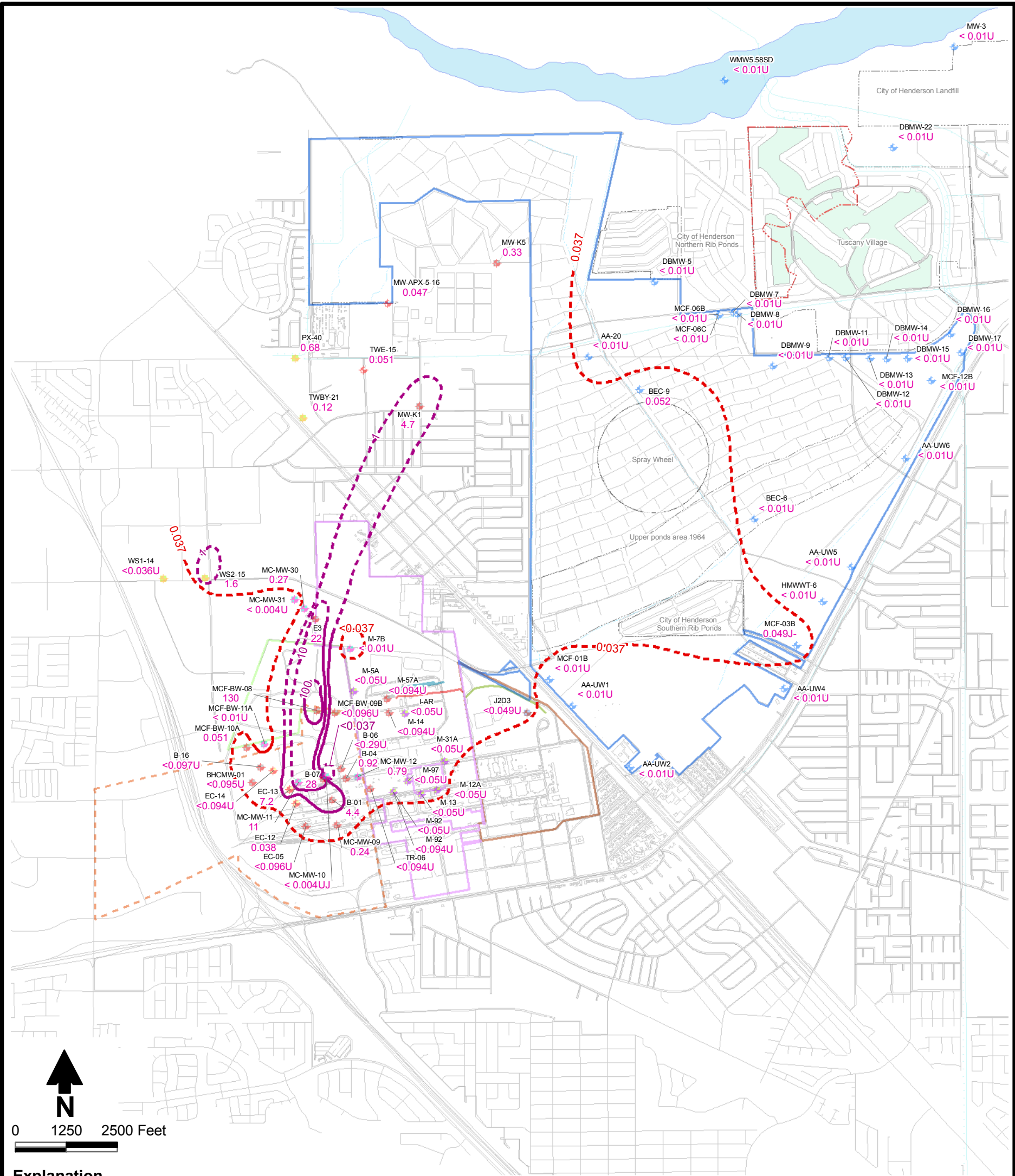
Beta BHC
Shallow Zone Layer 1



Prepared by:
DBS&A CRS

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/beta_BHC_LAYER1.MXD 019040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- BRC - 2009
- CAMU - 2009
- POSSOM - 2006
- POSSOM - 2007
- POSSOM - 2008
- POSSOM - 2009
- TIMET - 2006
- TRONOX - 2006

M-13
<0.05U
Monitoring well designation
Result (ug/L)

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph
dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)
- BCL = 0.037 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 0.037 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Beta BHC
Shallow Zone Layer 2



Prepared by:
DBS&A CRS

Date
09-14-10

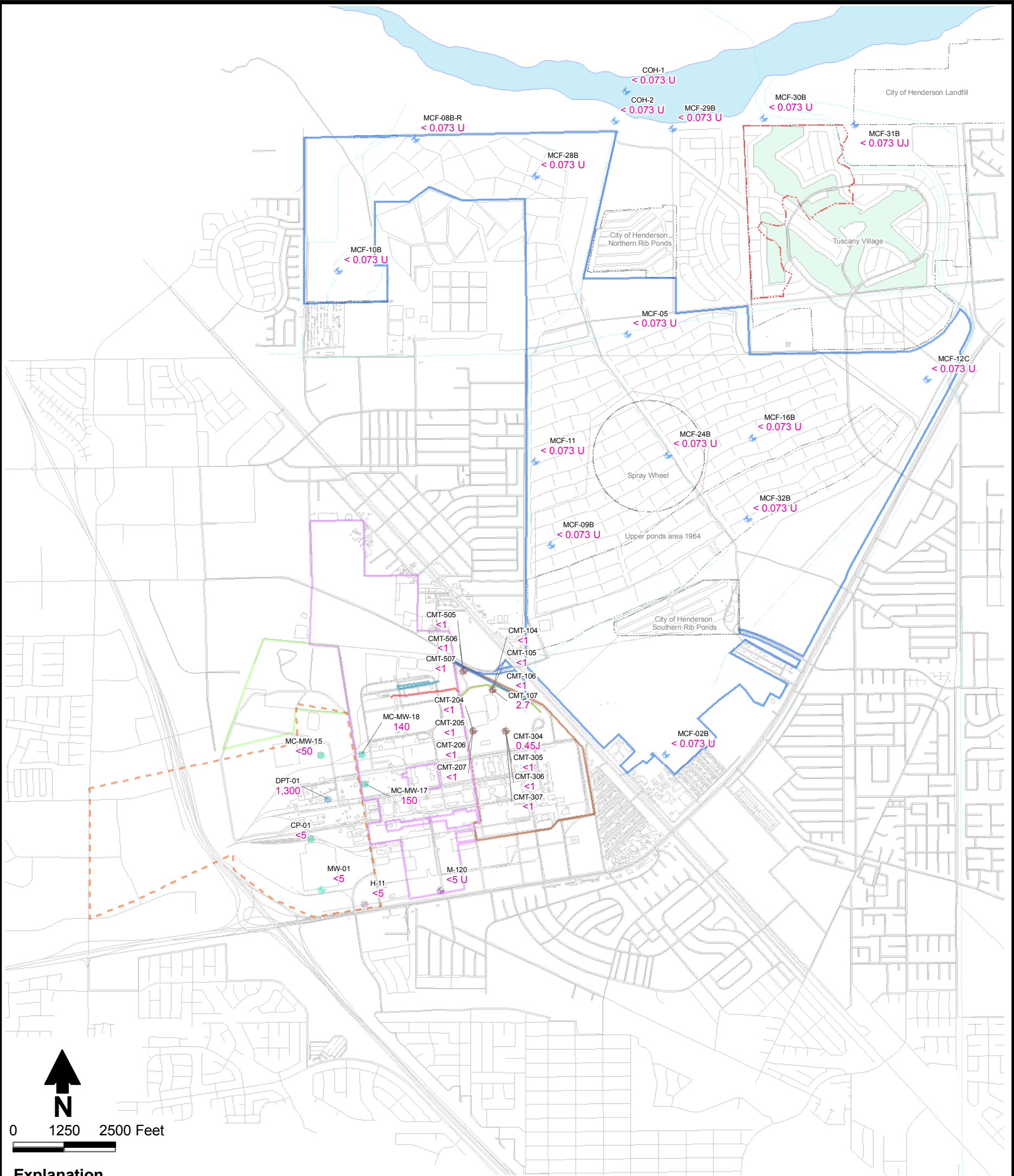
S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS\MXDS\CHEMISTRY/
LAYER_MODEL\betaeta_BHC_LAYER1.MXD 019040

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER MODEL/carbon_tetrachloride_layer1.MXD 016040

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 5 ug/L
4. BCL = 5 ug/L

- S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/carbon_tetrachloride_LAYER2.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2008
- BRC - 2009
- Montrose - 2008
- Montrose - 2009
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2006

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 5 ug/L
4. BCL = 5 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

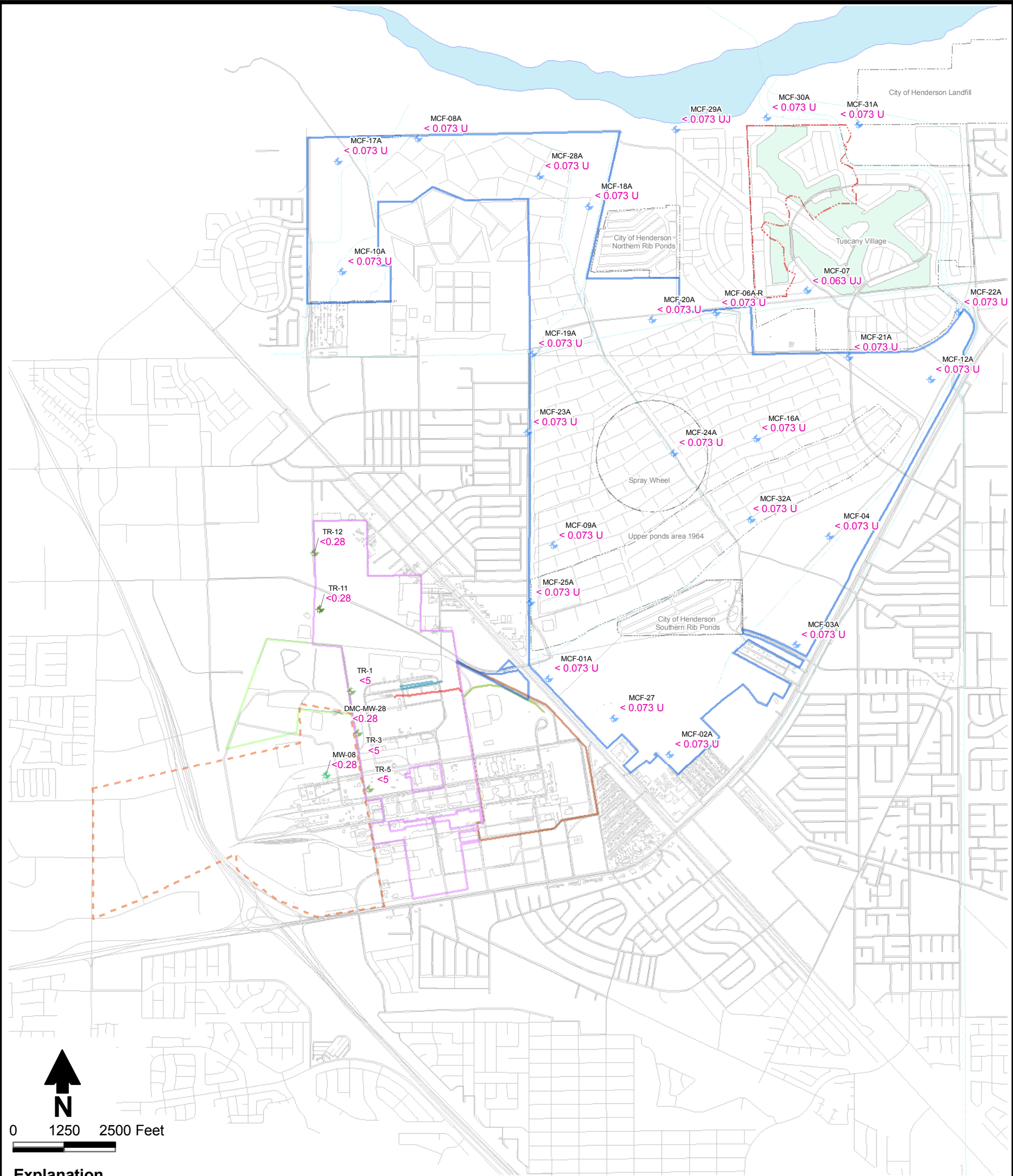
Carbon Tetrachloride
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/carbon_tetrachloride_middle.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2009
- BRC - 2009
- BRC - 2010
- City of Henderson, Nevada - 2008
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 5 ug/L
4. BCL = 5 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

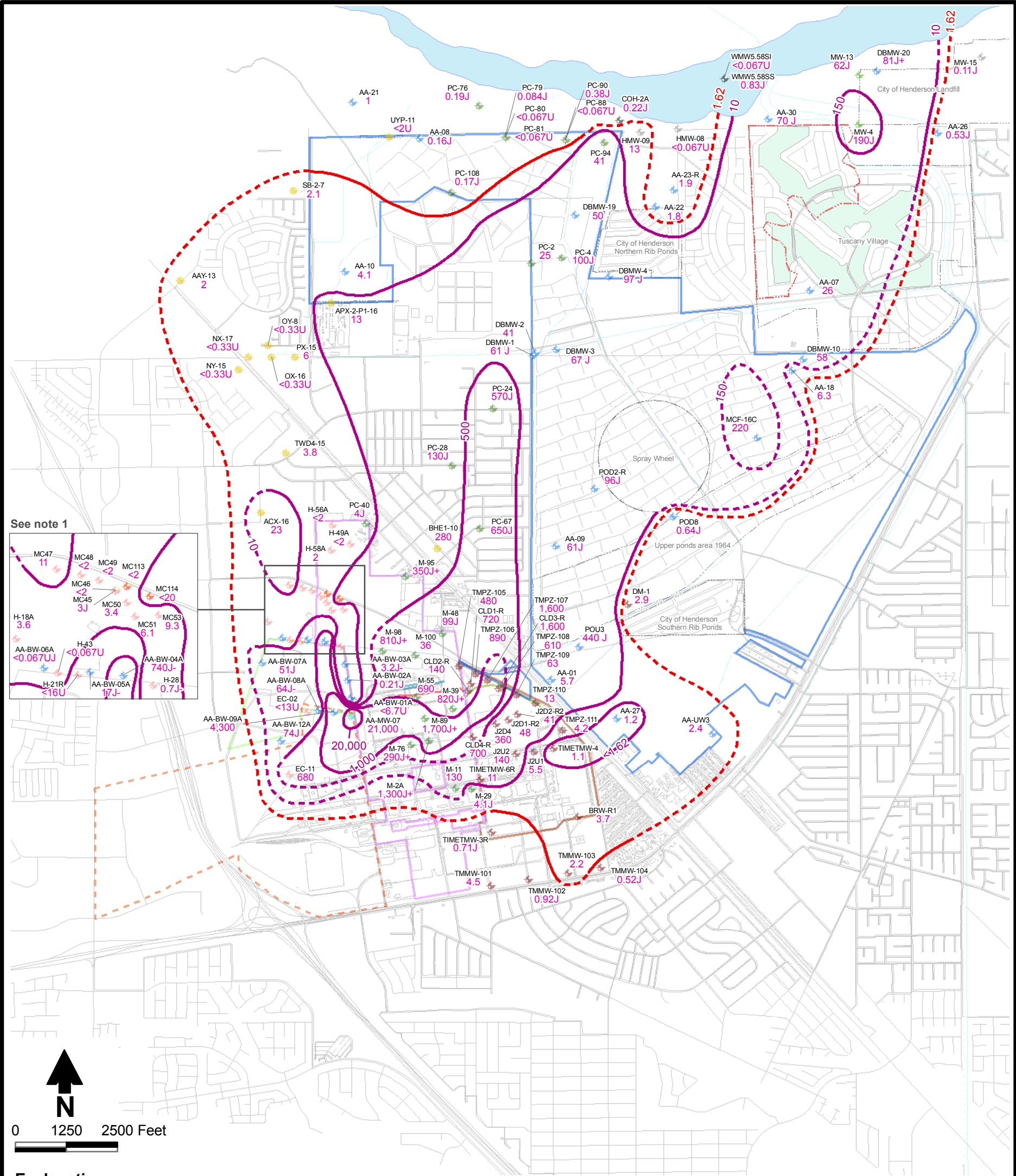
Carbon Tetrachloride
Deep Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/carbon_tetrachloride_deep.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2004
- BRC - 2009
- City of Henderson - 2009
- Kerr-McGee - 2006
- Kerr-McGee - 2009
- Montrose - 2009

- OSM Companies - 2009
- SNWA - 2009
- Stauffer - 2006
- Stauffer - 2009
- TIMET - 2006
- TIMET - 2008
- TIMET - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- BCL = 1.62 ug/L

MW-02
3.7
Monitoring well designation
Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2007a; TIMET, 2008a; TIMET, 2008b; TIMET, 2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. This parameter has no MCL
3. MCL = USEPA Maximum Contaminant Level
4. BCL = Basic Comparison Level
5. BCL = 1.62 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

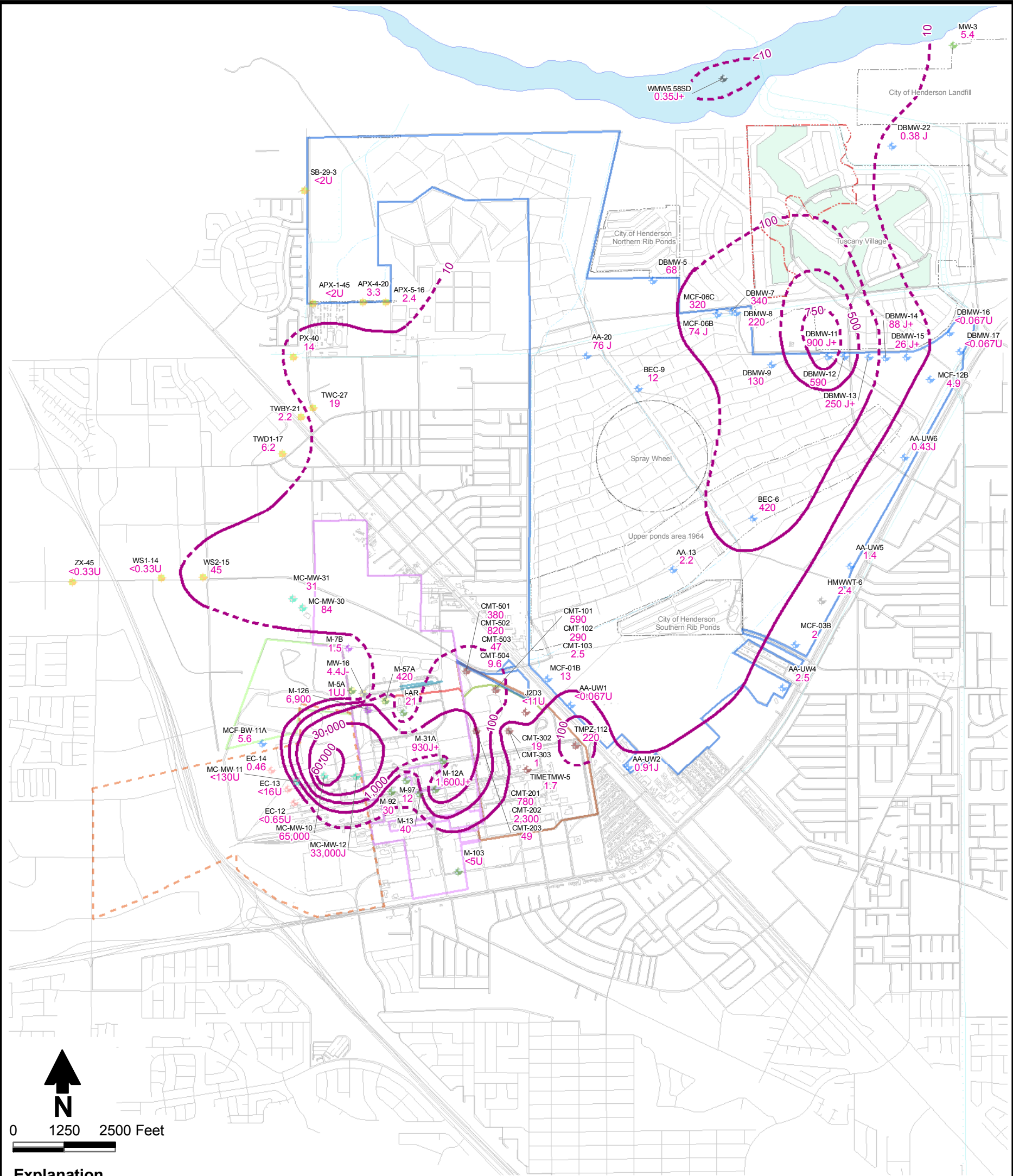
Chloroform Layer 1
Shallow Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/CHLOROFORM_LAYER1.MXD 015050



Explanation

Well Site - Date of Data

- Site not known - 2007
- Site not known - 2009
- AMPAC - 2004
- BRC - 2009
- City of Henderson - 2009
- Kerr-McGee - 2006
- Kerr-McGee - 2007

- Montrose - 2009
- SNWA - 2009
- Stauffer - 2009
- TIMET - 2008
- TIMET - 2009
- Tronox - 2007
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- Monitoring well designation Result (ug/L)

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010
- TIMET,2008b; TIMET,2010

Notes:

- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 1.62 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

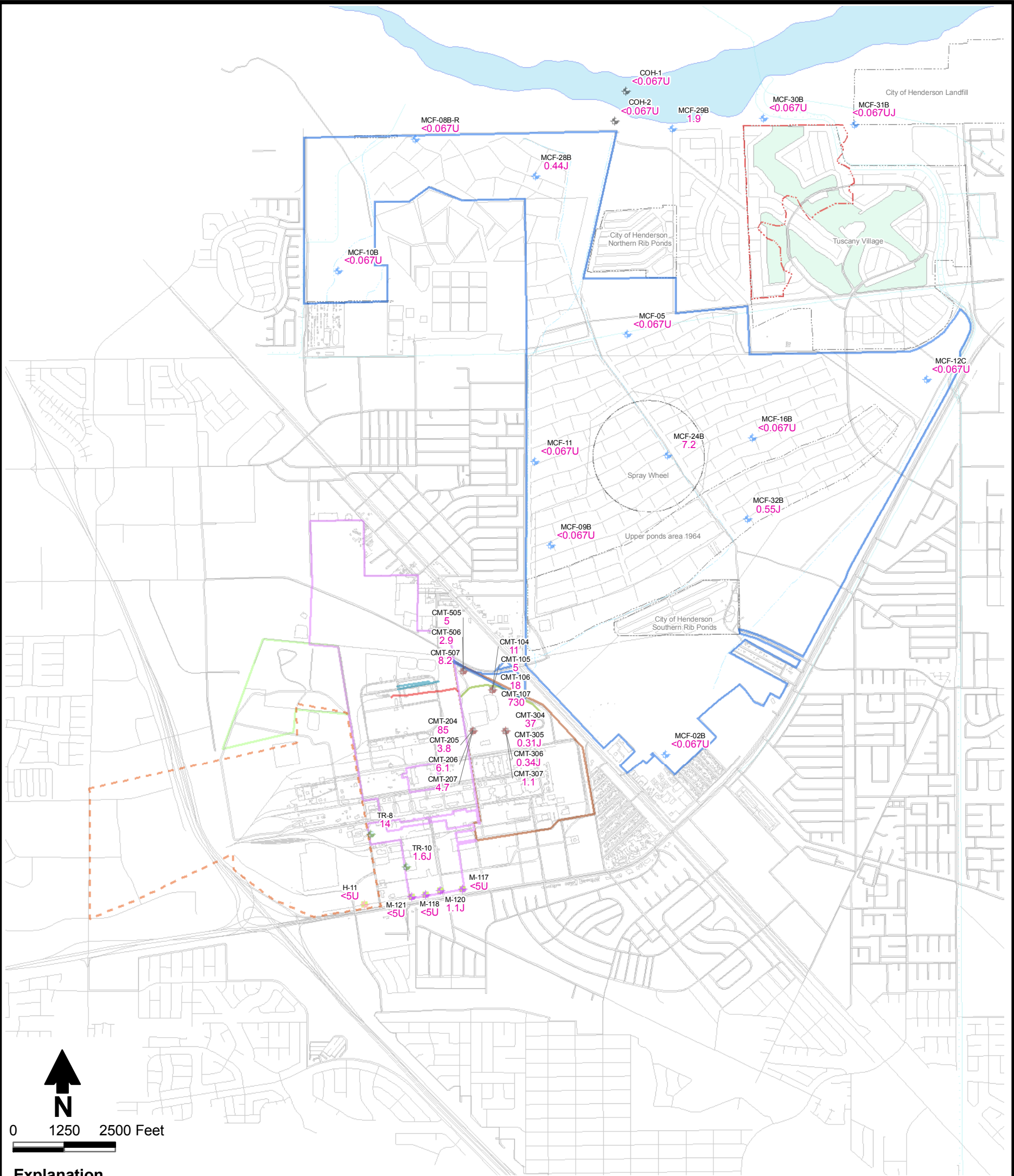
Chloroform Layer 2
Shallow Zone



Prepared by:
DBS&A AFM

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/CHLOROFORM_LAYER2.MXD 016240



Explanation

Well Site - Date of Data

- AMPAC - 2005
- BRC - 2009
- Kerr-McGee - 2006
- Montrose - 2008
- SNWA - 2009

- Stauffer - 2006
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2006
- Tronox - 2007

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

- BRC, 2010
- NDEP, 2010
- TIMET, 2008b

Notes:

- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 1.62 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

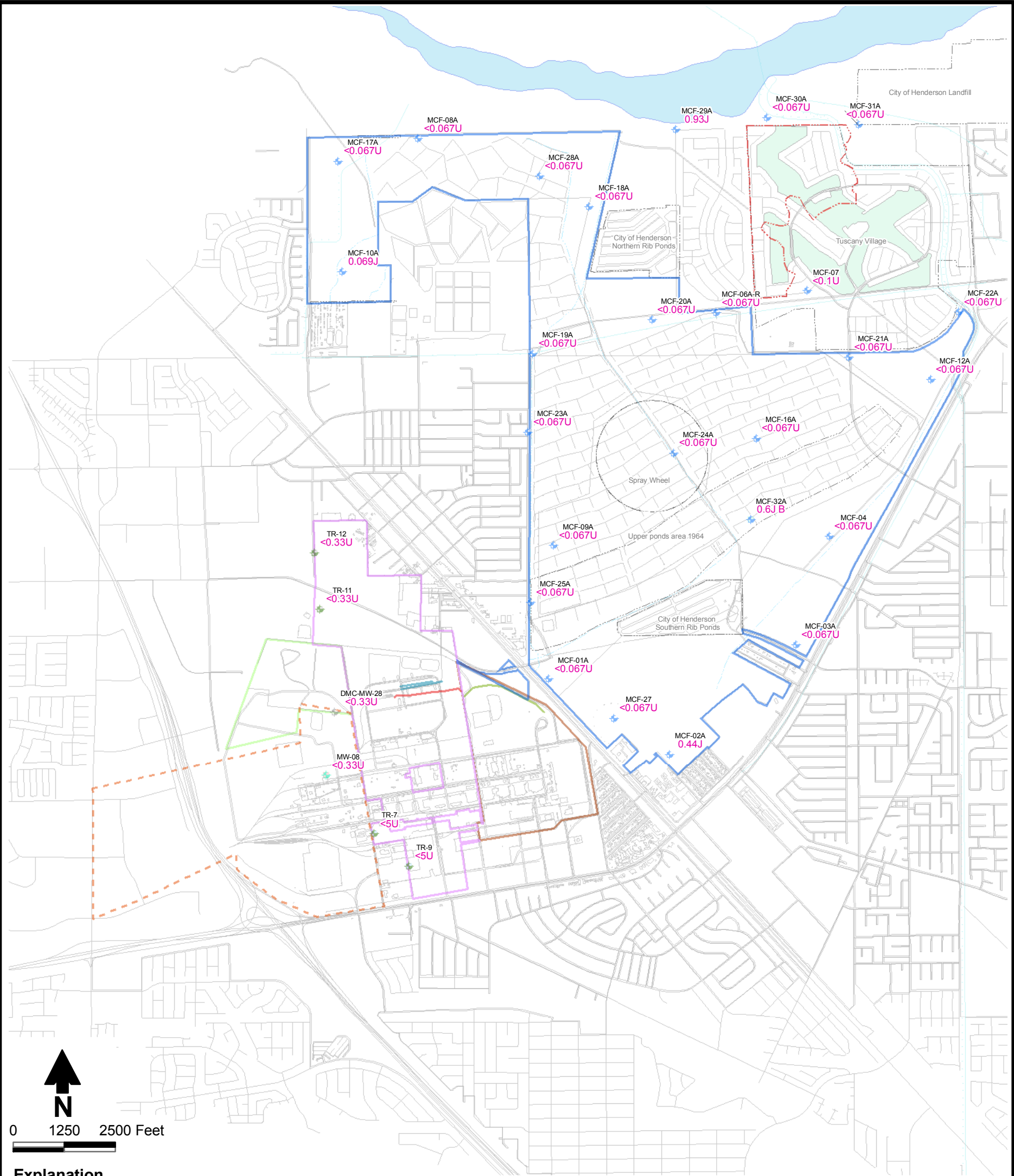
Chloroform
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/CHLOROFORM_MIDDLE.MXD 016240



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2005
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2006
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 1.62 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Chloroform
Deep Zone

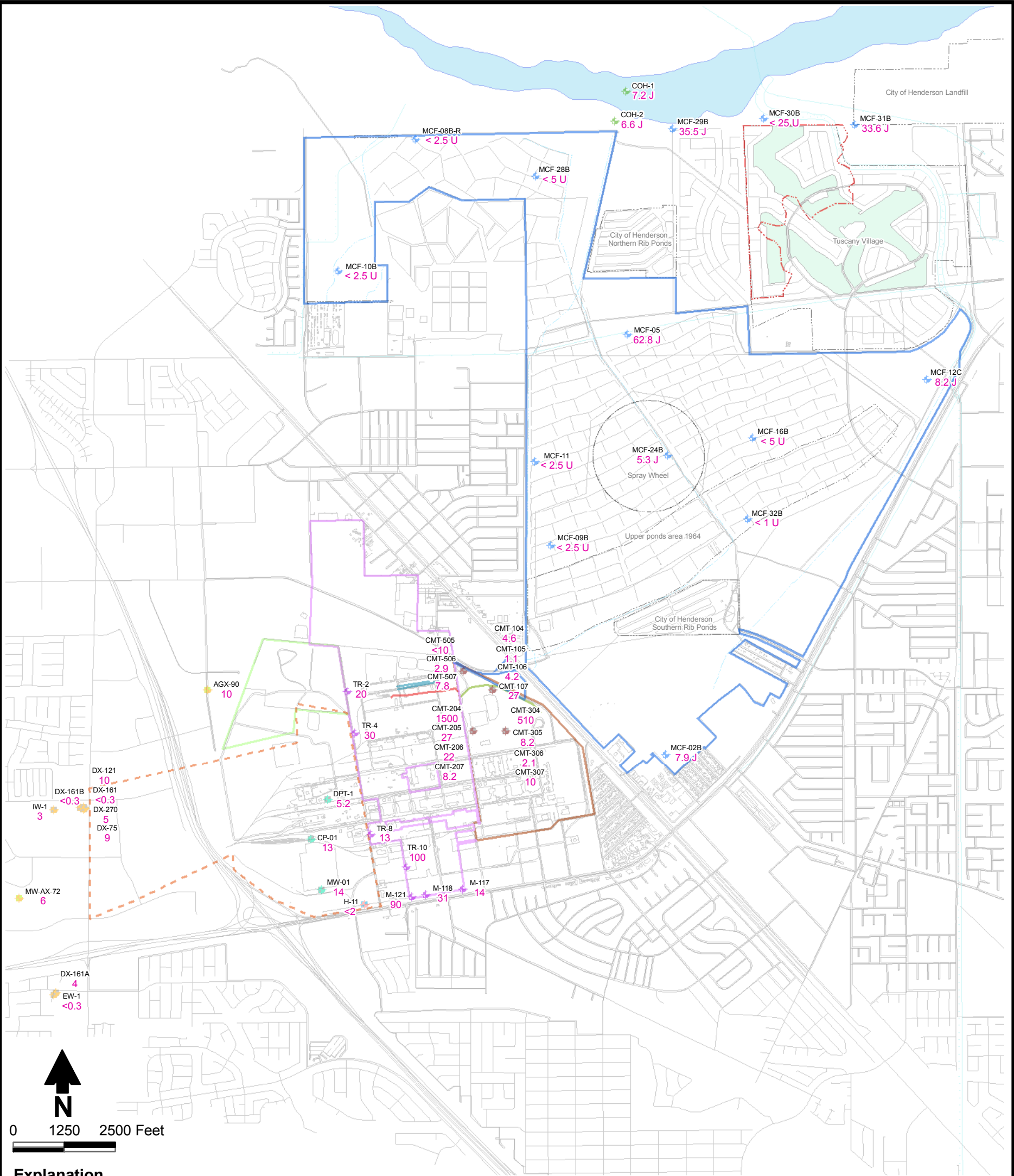


Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/CHLOROFORM_DEEP.MXD 015050

BMI Common Areas (Eastside) Henderson, Nevada		
Total Chromium Shallow Zone Layer 2		
Prepared by: DBS&A CRS	Date 09-17-10	S:\PROJECTS\BRC\ES09_0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\total_cr_LAYER2.MXD 016040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2005
- BRC - 2009
- City of Henderson, Nevada - 2009
- Montrose - 2008
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b;
4. TRONOX, 2009

Notes:

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 100 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

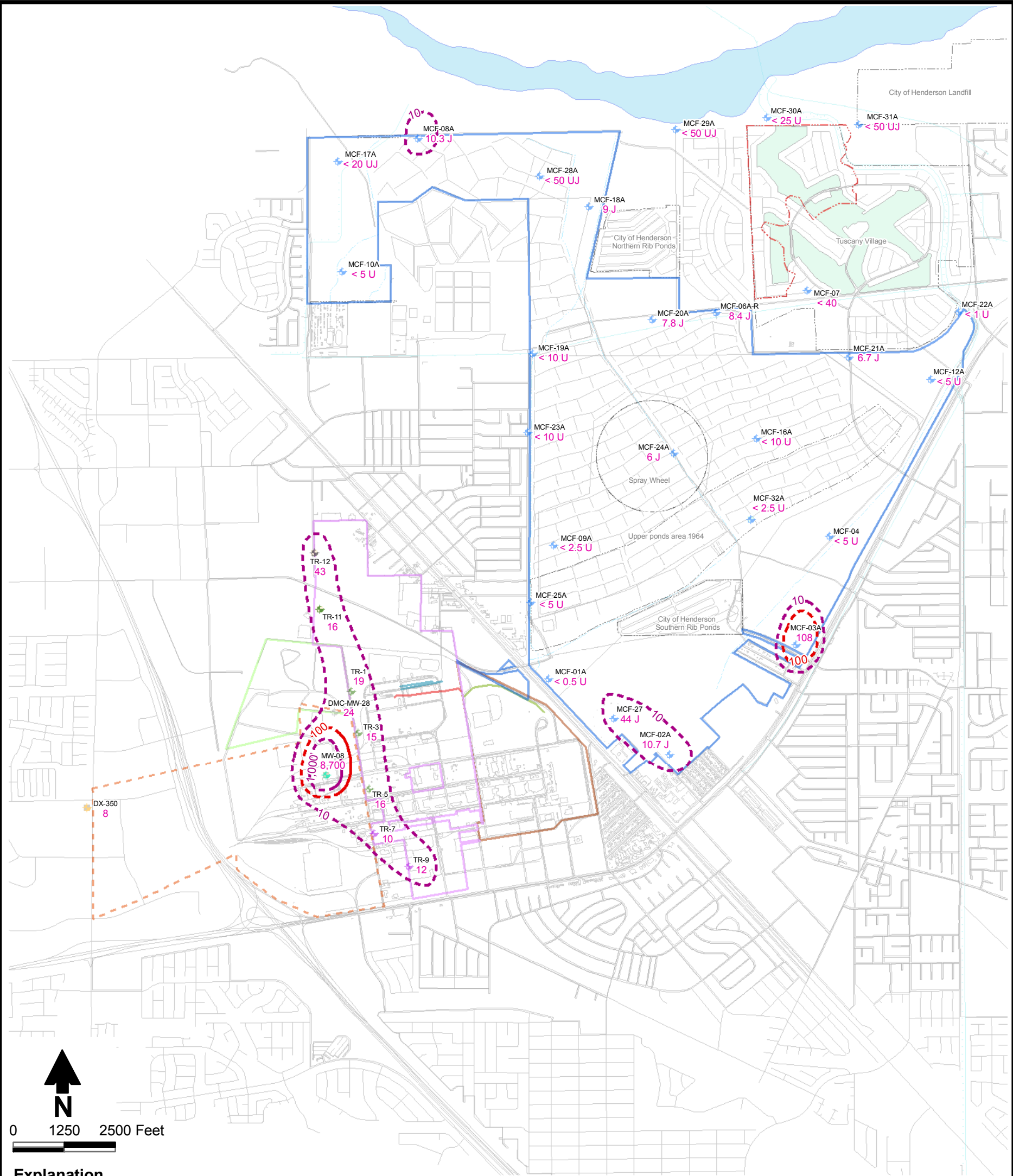
Total Chromium
Middle Zone



Prepared by:
DBS&A CRS

Date
09-17-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\total_cr_middle.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2005
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2008

MW-08
8,700
Monitoring well designation
Result (ug/L)

- Kerr-McGee - 2009
- Montrose - 2008
- Montrose - 2009
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 100 ug/L

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010
- TRONOX, 2009

Notes:

- This parameter has no BCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 100 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Total Chromium
Deep Zone

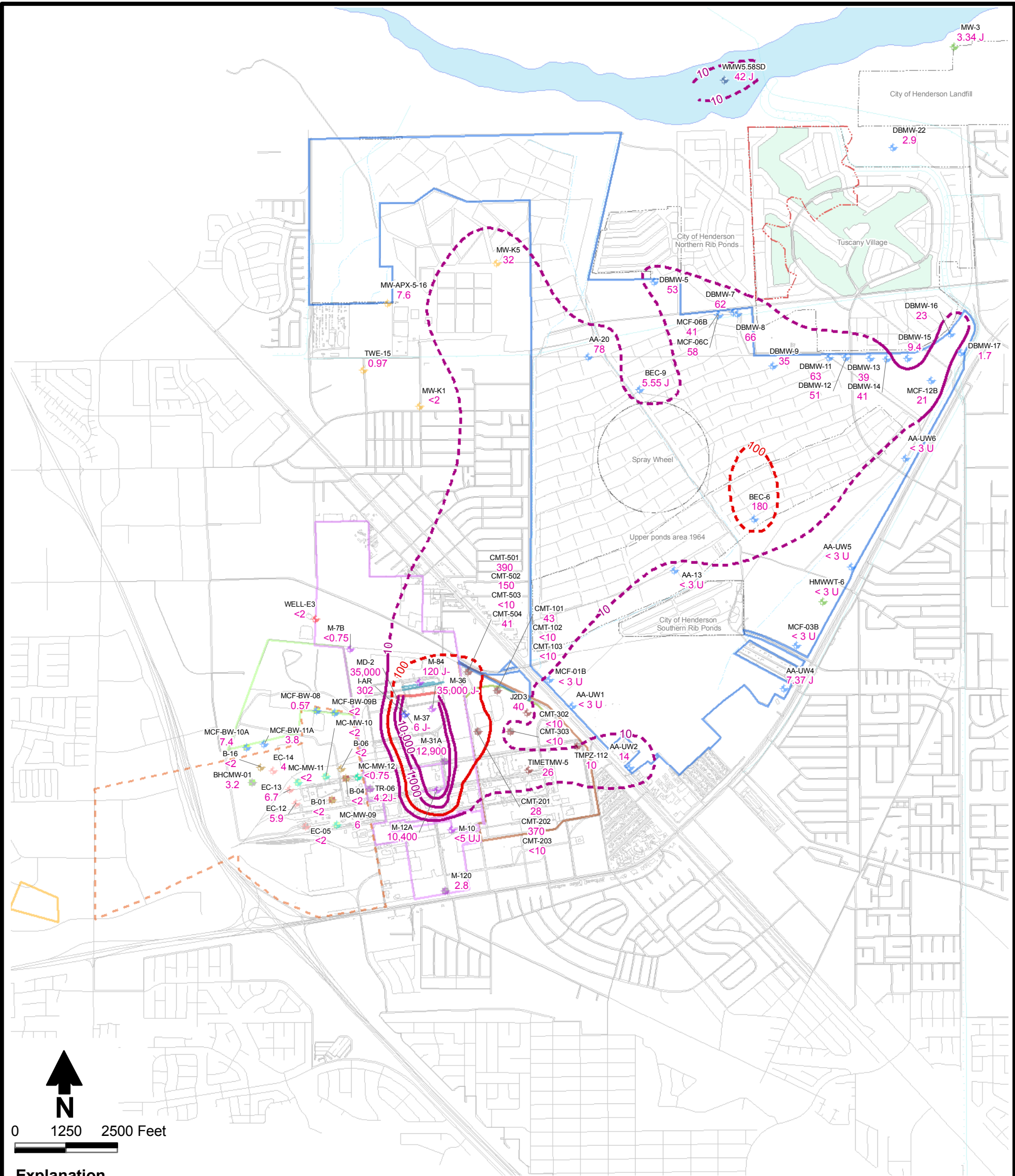


Prepared by:
DBS&A CRS

Date
09-17-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/total_cr_LAYER1.MXD 016040

BMI Common Areas (Eastside) Henderson, Nevada		
Hexavalent Chromium (Cr(VI)) Shallow Zone Layer 1		
Prepared by: DBS&A CRS		Date: 09-17-10
 Daniel B. Stephens & Associates, Inc.		 Basic Remediation C O M P A N Y
S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\total_cr_LAYER1_VER2.MXD 016040		



Explanation

Well Site - Date of Data

- Site not known - 2007
- Site not known - 2009
- AMPAC - 2006
- BRC - 2007
- BRC - 2009
- U.S. Bureau of Reclamation - 2009
- City of Henderson, Nevada - 2009
- Montrose - 2006
- Montrose - 2007
- Montrose - 2009

M-10 Monitoring well designation
<5 UJ Result (ug/L)

- Olin - 2006
- Olin - 2007
- OSM - 2006
- Stauffer - 2007
- Stauffer - 2009
- TIMET - 2008
- TIMET - 2009
- Tronox - 2007
- Tronox - 2009

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2008b; TIMET, 2010
5. TRONOX, 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- BCL = 100 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

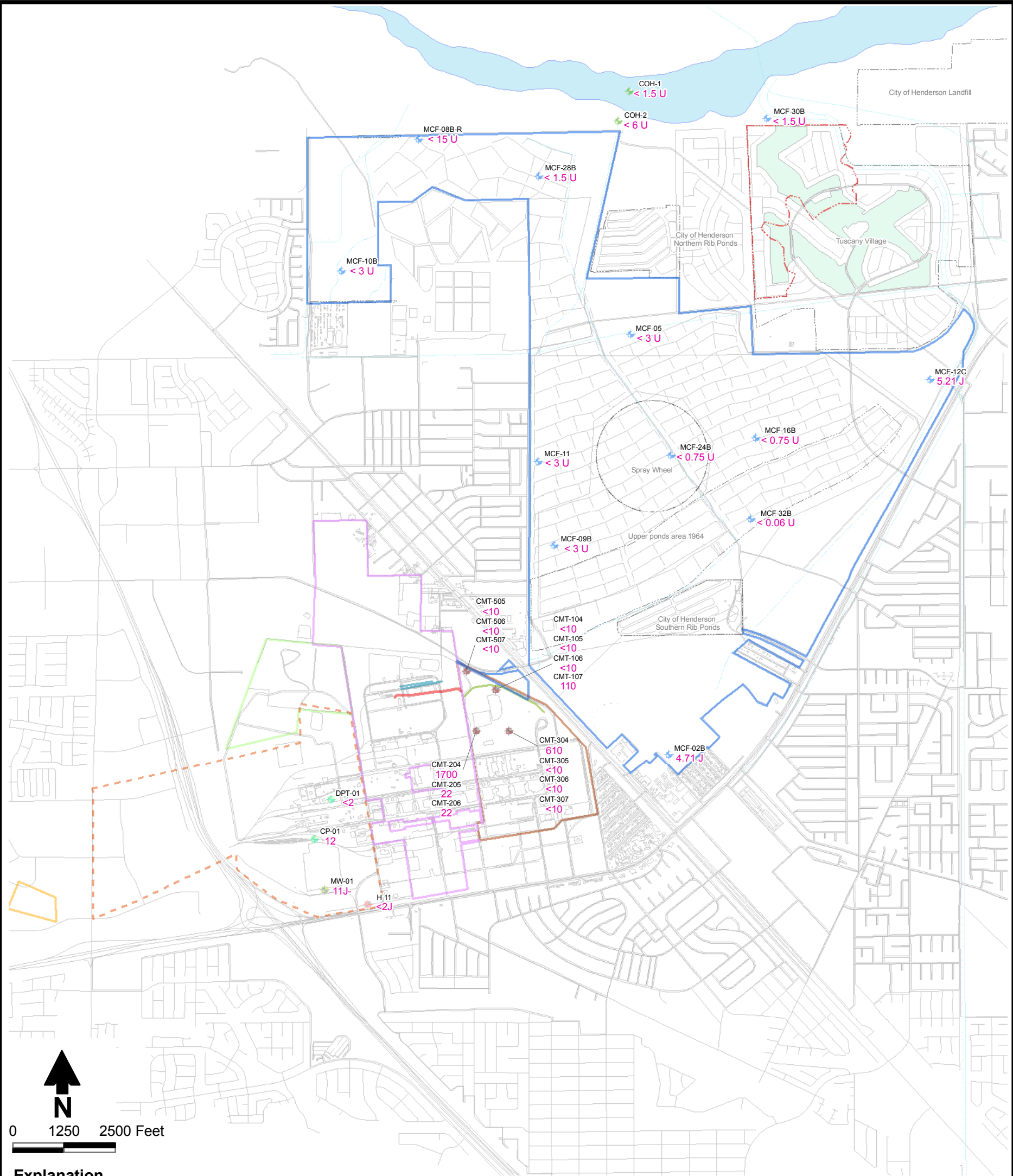
Hexavalent Chromium (Cr(VI))
Shallow Zone Layer 2



Prepared by:
DBS&A CRS

Date
09-17-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\total_cr_LAYER2.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2007
- BRC - 2009
- City of Henderson, Nevada - 2009
- Montrose - 2006
- Stauffer - 2007
- TIMET - 2008

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 100 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Hexavalent Chromium (Cr(VI))
Middle Zone

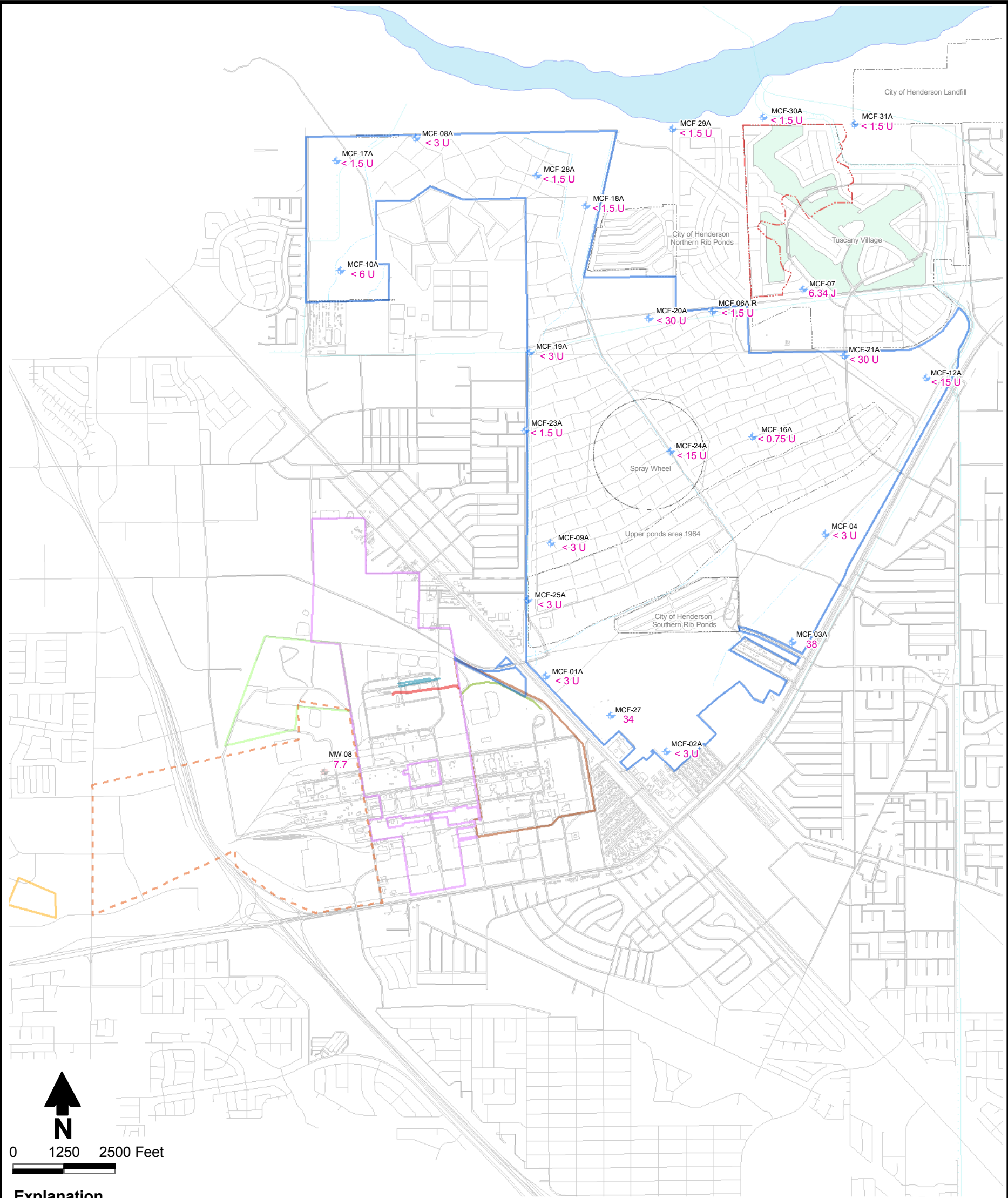
Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

Prepared by:
DBS&A CRS

Date
09-17-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/total_cr_MIDDLE.MXD 016040



Explanation

Well Site - Date of Data

Site not known - 2006

BRC - 2009

Site boundary

Gravel pit circa 1976.

Source: Aerial photograph dated 1976

TIMET boundary

Tronox boundary

POSSM (The Companies)

Site AOC3 boundary

Las Vegas Wash

TIMET proposed slurry wall
September 2008

Tronox groundwater
recharge trench

Tronox slurry wall

Street

Monitoring well designation
Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 100 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Hexavalent Chromium (Cr(VI))
Deep Zone



Daniel B. Stephens
& Associates, Inc.



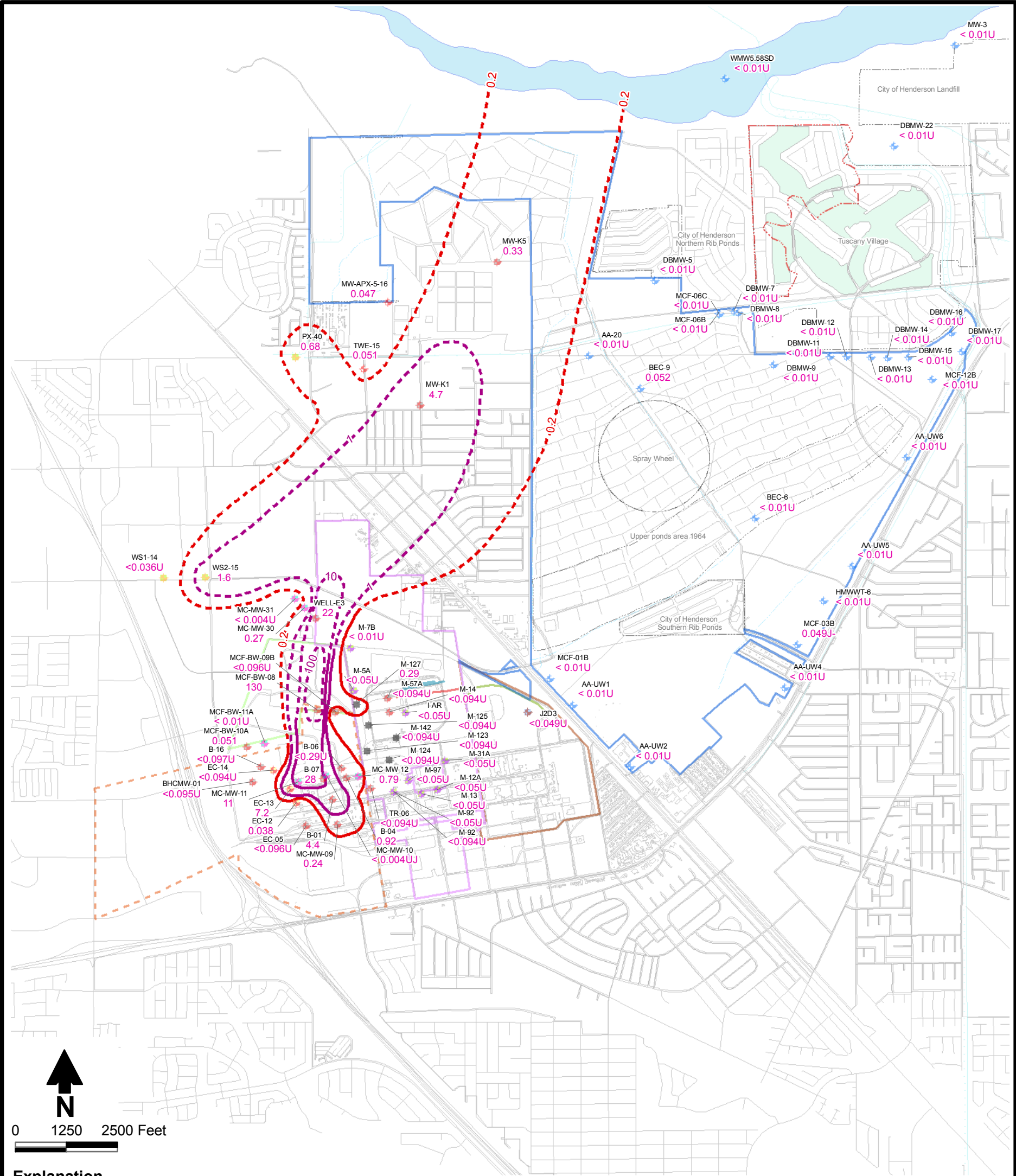
Basic Remediation
COMPANY

Prepared by:
DBS&A CRS

Date
09-17-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/total_cr_LAYER1_VER2.MXD 016040

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/Gamma_BHC_LAYER1.MXD 019040



Explanation

Well Site - Date of Data

- AMPAC - 2004
 - BRC - 2009
 - CAMU - 2009
 - POSSOM - 2006
 - M-13
<0.05U
- Monitoring well designation
Result (ug/L)

- POSSOM - 2007
- POSSOM - 2008
- POSSOM - 2009
- TIMET - 2006
- TRONOX - 2006
- Unknown layer

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph
dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)
- MCL = 0.2 ug/L
- BCL = 0.2 ug/L

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010

Notes:

- POSSM Groundwater Extraction/Air Stripping/Re-injection System
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 0.2 ug/L
- BCL = 0.2 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Gamma BHC
Shallow Zone Layer 2



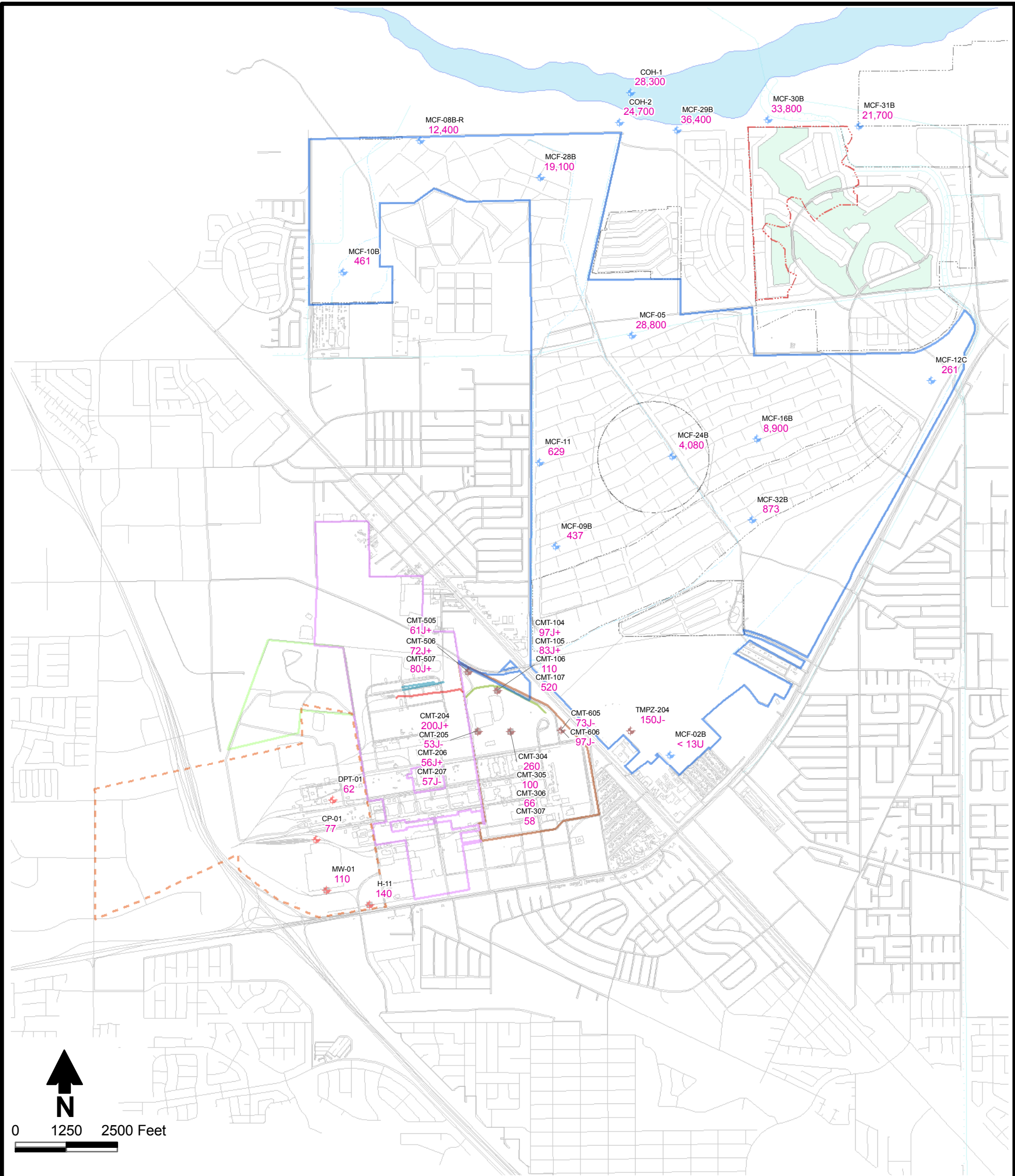
Prepared by:
DBS&A AFM

Date
09-14-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS\MXDS\CHEMISTRY/
LAYER_MODEL\Gammaamma_BHC_LAYER1.MXD 019040

09-14-10

BMI Common Areas (Eastside) Henderson, Nevada		
Lithium Shallow Zone Layer 2		
DBS&A CRS	Date 09-14-10	<i>Daniel B. Stephens & Associates, Inc.</i> Basic Remediation C O M P A N Y
S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\lithium_LAYER1.MXD 019040		



Explanation

Well Site - Date of Data

- BRC, 2009
- POSSOM - 2006
- POSSOM - 2007
- TIMET - 2008
- TIMET - 2009

H-11
140
Monitoring well designation
Result (ug/L)

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash
- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street

- References:
- BRC, 2010
 - NDEP, 2010

- Notes:
- This parameter has no MCL
 - MCL = USEPA Maximum Contaminant Level
 - BCL = Basic Comparison Level
 - BCL = 73 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

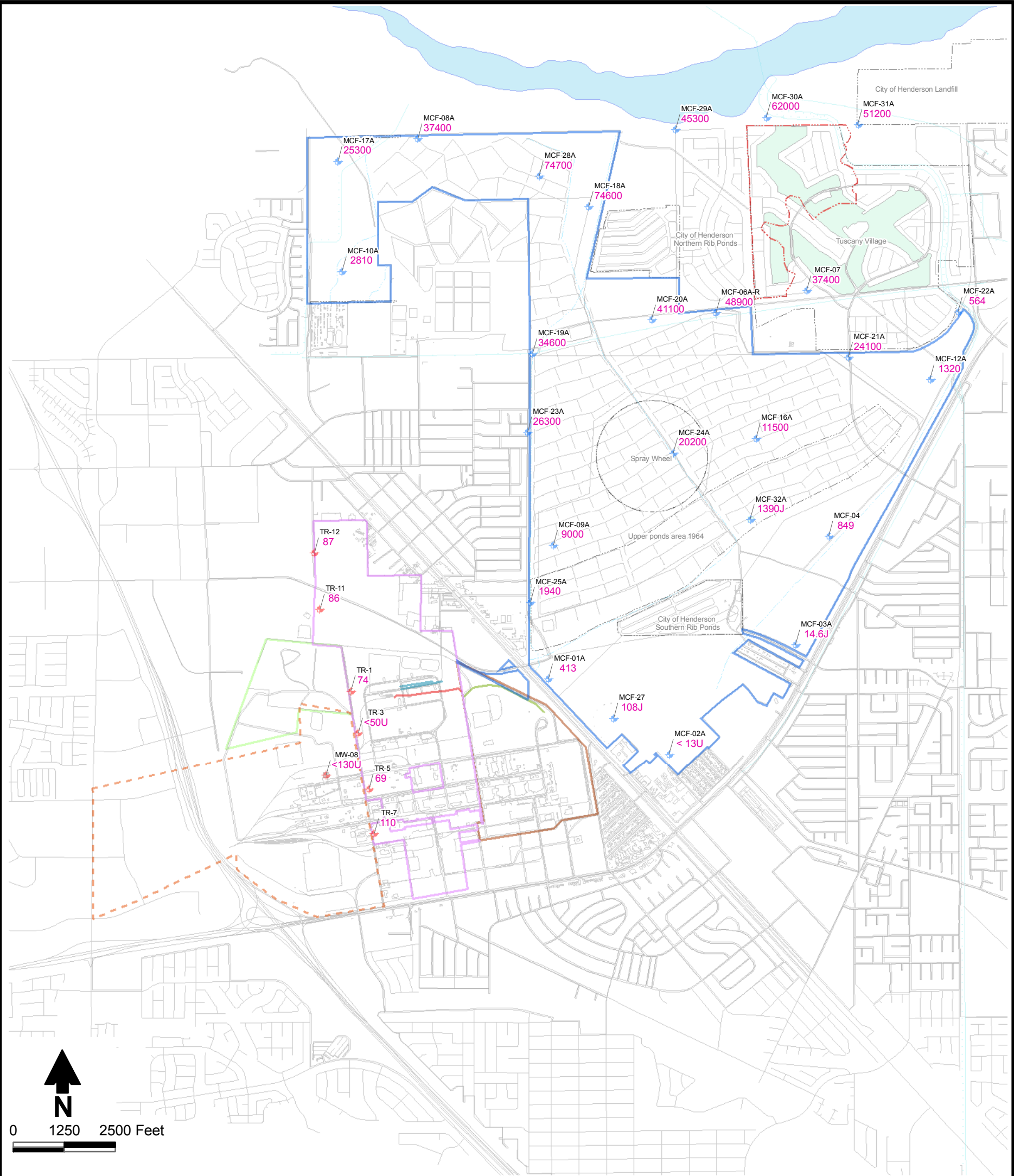
Lithium
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/lithium_mid.MXD 019040



Explanation

Well Site - Date of Data

- BRC - 2009
- BRC - 2010

Monitoring well designation
Result (ug/L)

- POSSOM - 2004
- POSSOM - 2006

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash
- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street

- References:
- BRC, 2010
 - NDEP, 2010

- Notes:
- This parameter has no MCL
 - MCL = USEPA Maximum Contaminant Level
 - BCL = Basic Comparison Level
 - BCL = 73 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Lithium
Deep Zone



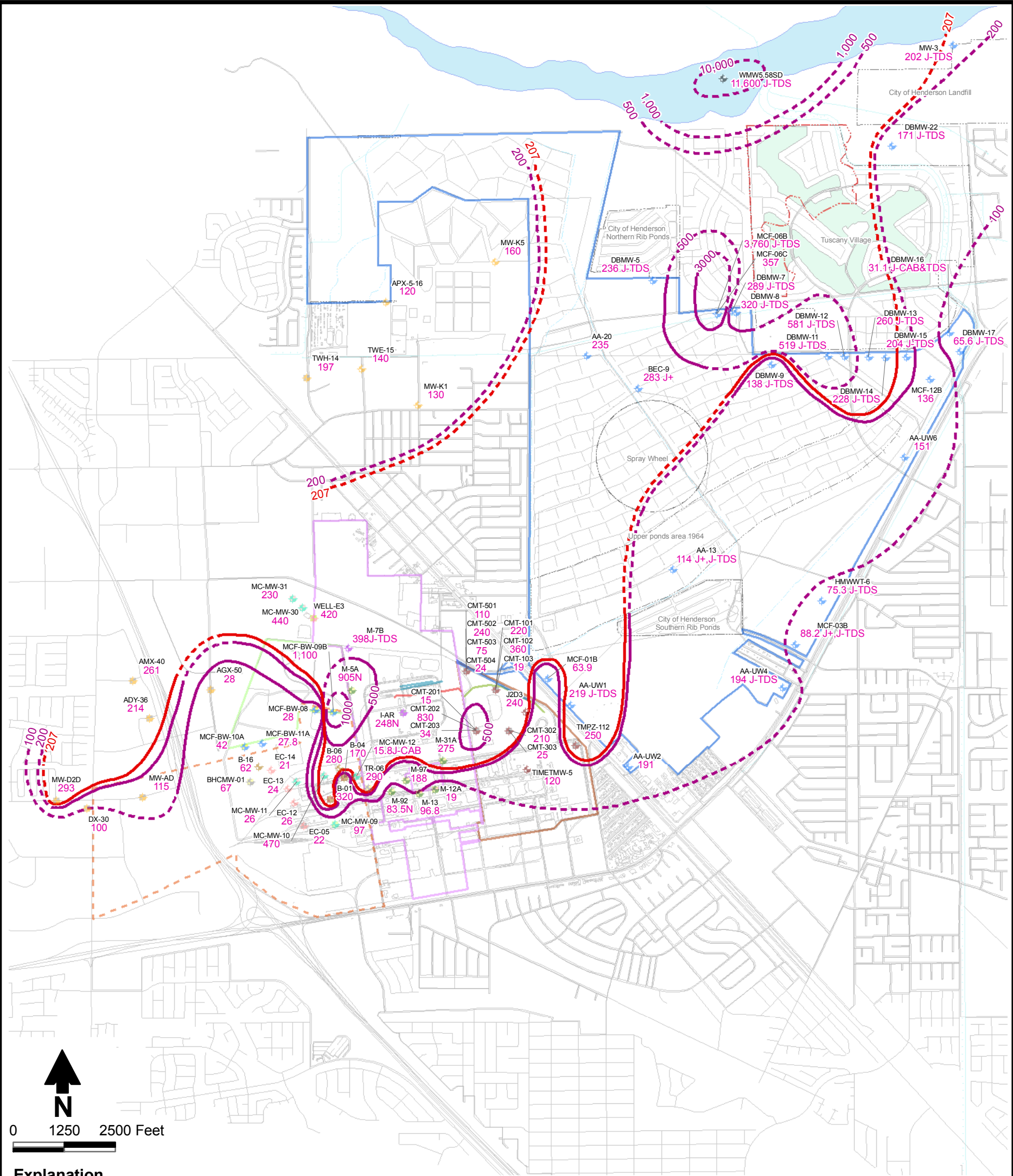
Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MO_mid.MXD 019040



Basic Remediation
COMPANY



Explanation

Well Site - Date of Data

- Site not known - 2007
- AMPAC - 2005
- AMPAC - 2006
- BRC - 2007
- BRC - 2009
- Kerr-McGee - 2007
- Montrose - 2006
- Montrose - 2009
- Olin - 2006
- Monitoring well designation
- Result (mg/L)

- Olin - 2007
- SNWA - 2009
- Stauffer - 2006
- Stauffer - 2007
- Stauffer - 2009
- TIMET - 2008
- TIMET - 2009
- TRONOX - 2007
- TRONOX - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- BCL = 207 mg/L

Notes:

- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 207 mg/L

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010
- TIMET, 2008b; TIMET, 2010

BMI Common Areas (Eastside)
Henderson, Nevada

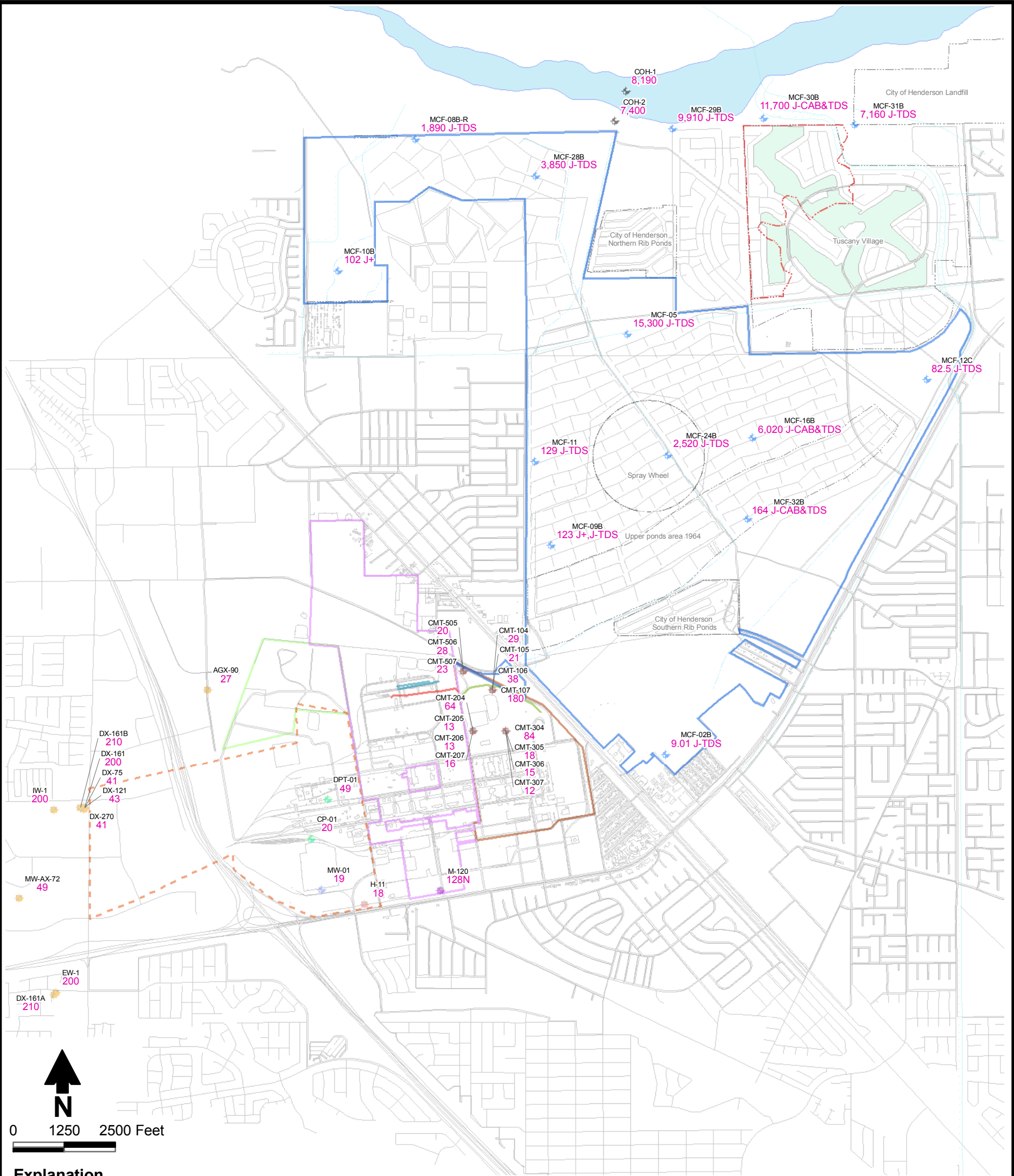
Magnesium
Shallow Zone Layer 2

Prepared by:
DBS&A AFM

Date
09-14-10



S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\MAGNESIUM_LAYER2.MXD 016840



Explanation

Well Site - Date of Data

- AMPAC - 2005
- BRC - 2009
- Montrose - 2008
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2007
- Monitoring well designation
- Result (mg/L)

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 207 mg/L

BMI Common Areas (Eastside)
Henderson, Nevada

Magnesium
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

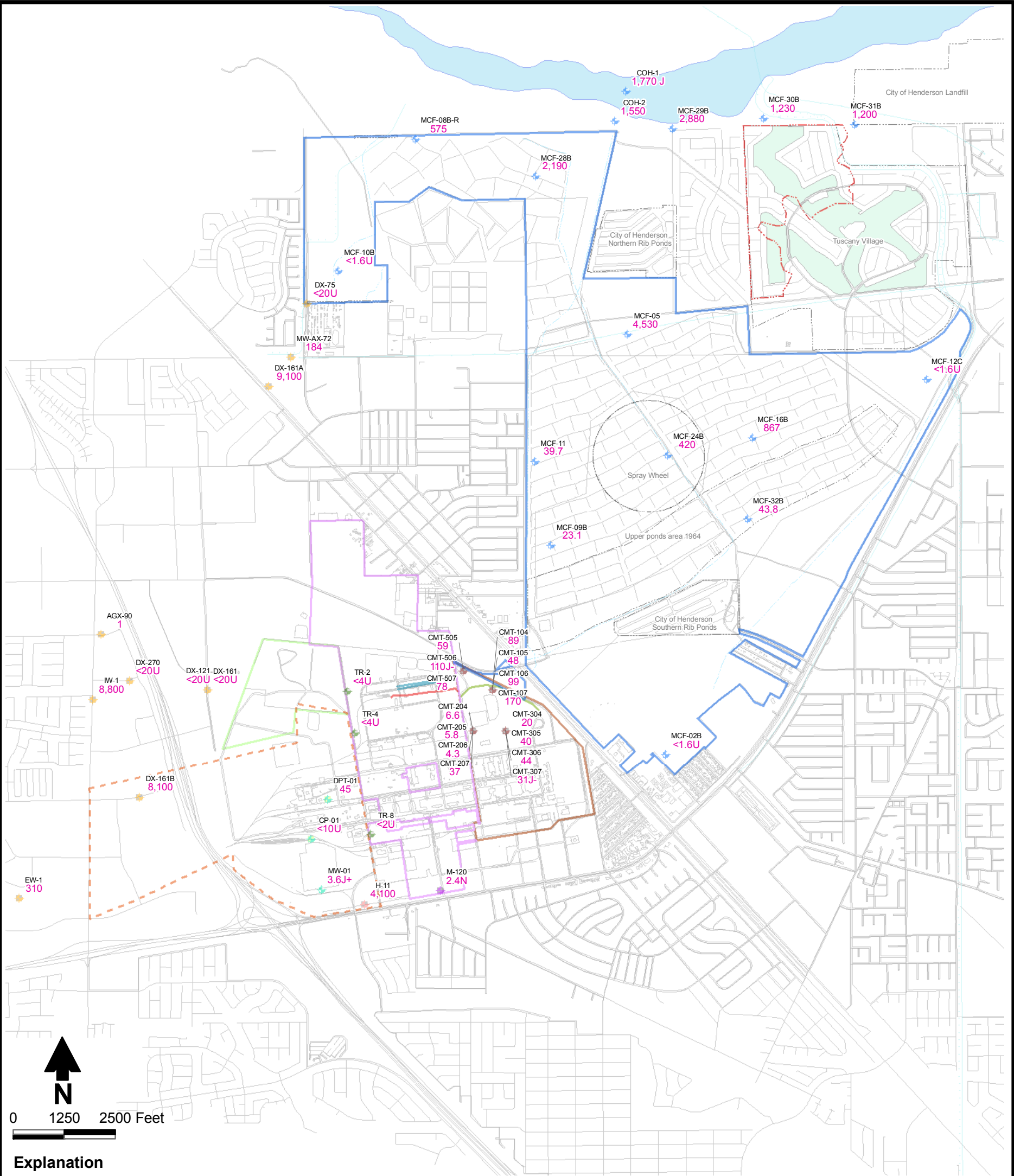
S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MAGNESIUM_MIDDLE.MXD 016240

- TIMET proposed slurry wall
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- BCL = 207 mg/L

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MAGNESIUM_DEEP.MXD 012840

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MANGANESE_LAYER1.MXD 016040

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MANGANESE_LAYER2.MXD 018240



Explanation

Well Site - Date of Data

- AMPAC - 2005
- BRC - 2009
- Kerr-McGee, 2009
- Montrose - 2006
- Montrose - 2007
- Montrose - 2008
- Stauffer - 2007
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2007

References:

- BRC, 2010
- NDEP, 2010
- TIMET,2008b

Notes:

- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 511 ug/L

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

BMI Common Areas (Eastside)
Henderson, Nevada

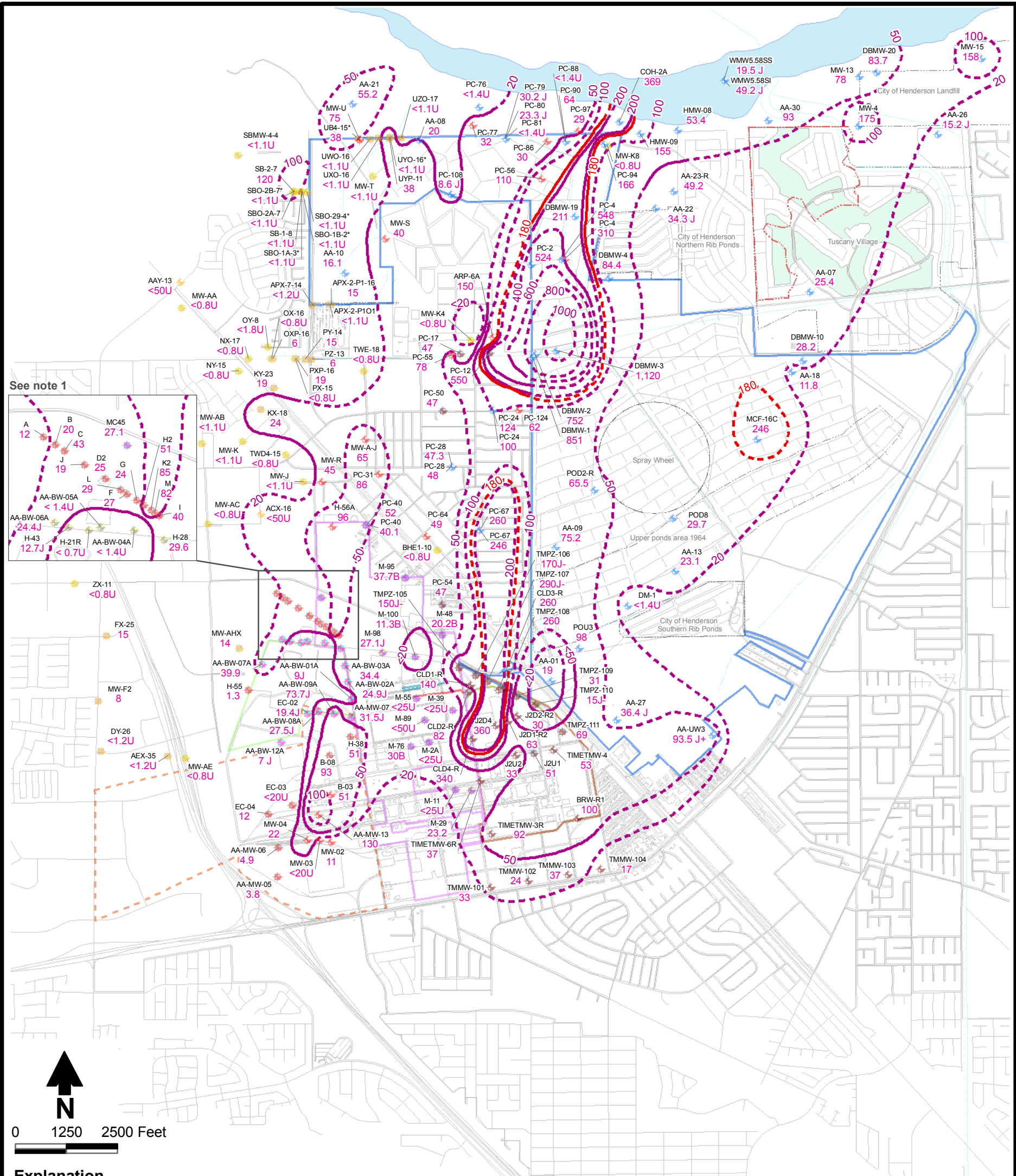
Manganese
Middle Zone

Prepared by:
 DBS&A AFM

Date
09-14-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\MANGANESE_MIDDLE.MXD 018240

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MANGANESE_DEEP.MXD 016040



Explanation

Well Site - Date of Data

- | | |
|---------------|---------------|
| AMPAC - 2004 | POSSOM - 2007 |
| AMPAC - 2005 | TIMET - 2006 |
| AMPAC - 2006 | TIMET - 2008 |
| BRC - 2009 | TIMET - 2009 |
| CAMU - 2009 | TRONOX - 2006 |
| POSSOM - 2006 | TRONOX - 2007 |
- MW-02
11 Monitoring well designation
Result (ug/L)

- | | |
|---|--|
| Site boundary | TIMET proposed slurry wall
September 2008 |
| Gravel pit circa 1976.
Source: Aerial photograph
dated 1976 | Tronox groundwater
recharge trench |
| TIMET boundary | Tronox slurry wall |
| Tronox boundary | Street |
| POSSM (The Companies) | Concentration contour
(dashed where inferred) |
| Site AOC3 boundary | BCL = 180 ug/L |
| Las Vegas Wash | |

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. * = layer 1 and layer 2
3. This parameter has no MCL
4. MCL = USEPA Maximum Contaminant Level
5. BCL = Basic Comparison Level
6. BCL = 180 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

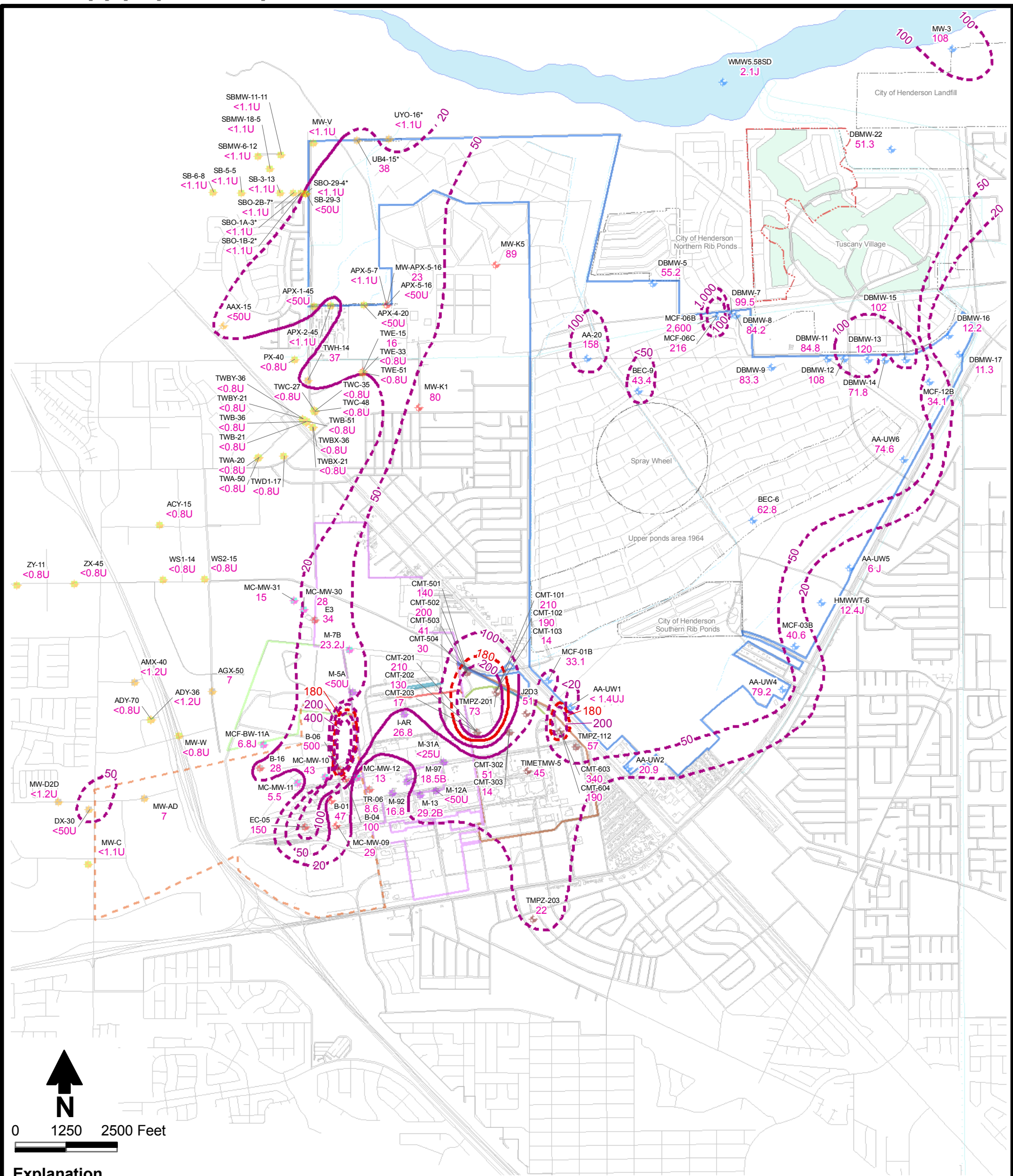
Molybdenum
Shallow Zone Layer 1



Prepared by:
DBS&A CRS

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ALPHA_BHC_LAYER1.MXD 019040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2005
- AMPAC - 2006
- BRC - 2009
- CAMU - 2009
- M-92
16.8
Monitoring well designation
Result (ug/L)

- POSSOM - 2006
- POSSOM - 2007
- TIMET - 2008
- TIMET - 2009
- TRONOX - 2007

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)
- BCL = 180 ug/L

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010

Notes:

- * = layer 1 and layer 2
- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 180 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Molybdenum
Shallow Zone Layer 2

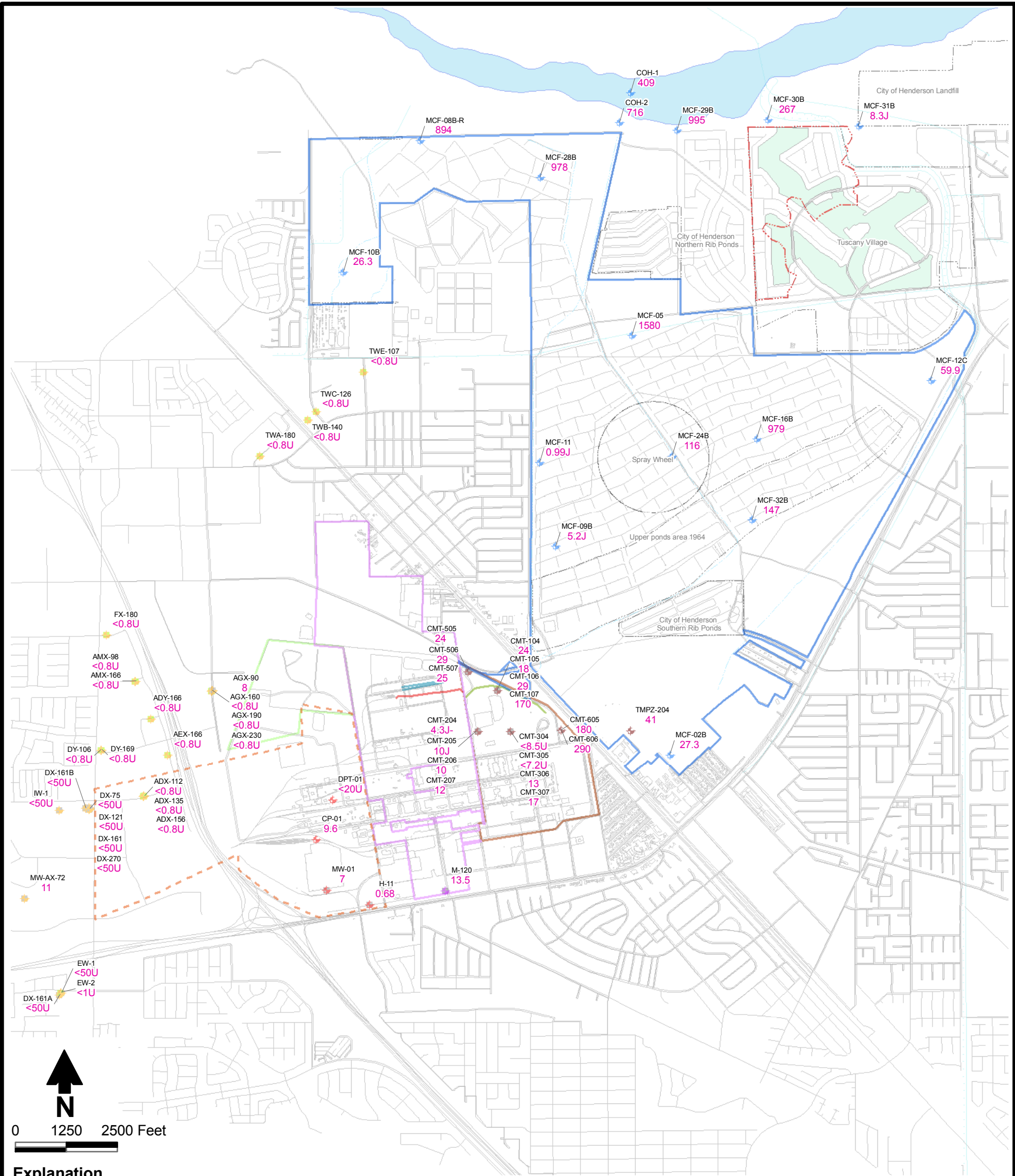
Prepared by:
DBS&A CRS

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ALPHA_BHC_LAYER1.MXD 019040

Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY



Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2005
- POSSOM - 2006
- H-11 0.68 Monitoring well designation Result (ug/L)

- POSSOM - 2007
- TIMET - 2008
- TIMET - 2009
- TRONOX - 2007
- BRC - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)

References:
1. BRC, 2010
2. NDEP, 2010

Notes:
1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 180 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

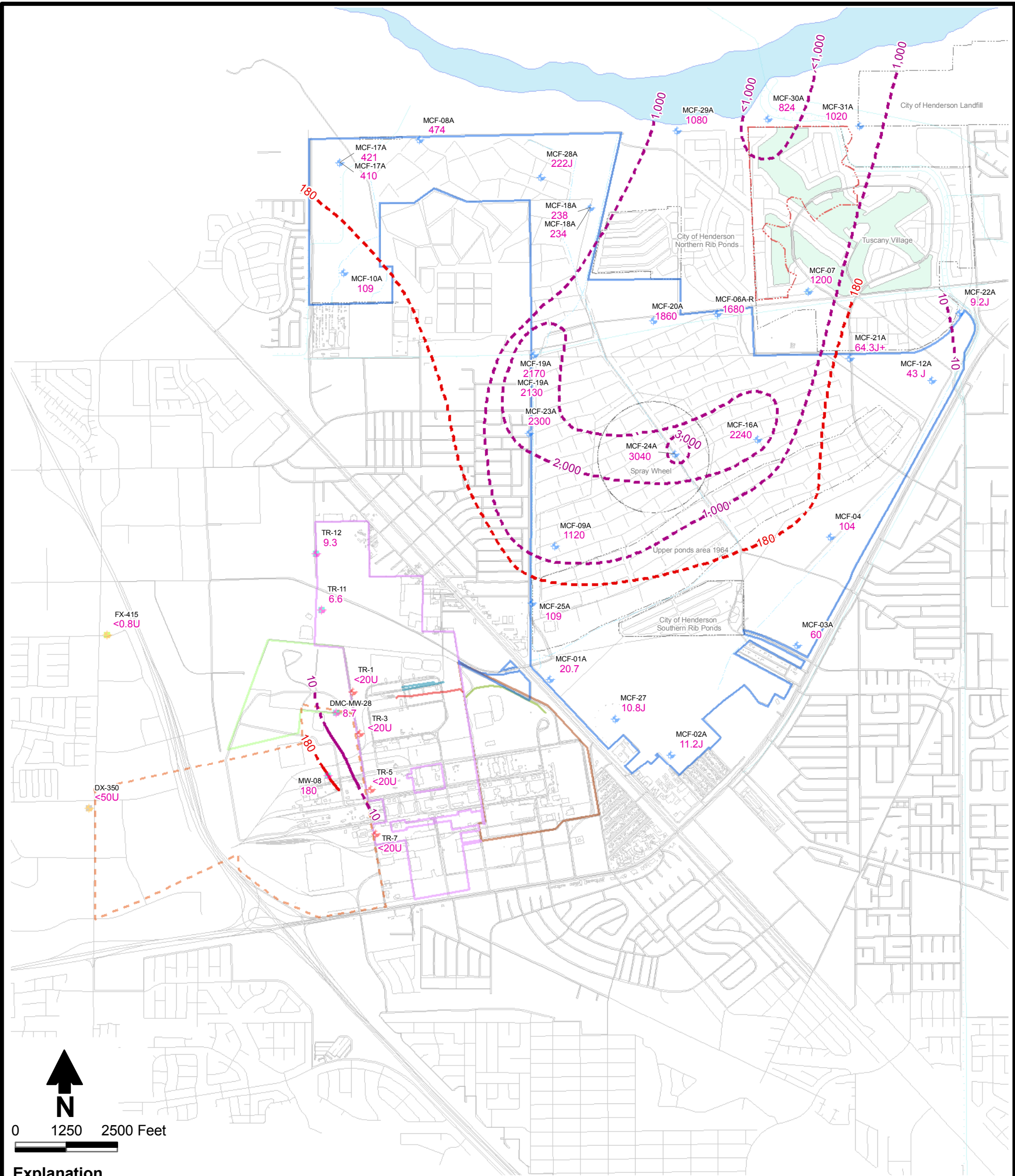
Molybdenum
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MO_mid.MXD 019040



Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2005
- BRC - 2009
- Monitoring well designation
- Result (ug/L)

- BRC - 2010
- CAMU - 2009
- POSSOM - 2004

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- BCL = 180 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 180 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Molybdenum
Deep Zone



Prepared by:
DBS&A AFM

Date
09-21-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/MO_mid.MXD 019040

- AMPAC - 2004
- AMPAC - 2008
- BRC - 2008
- BRC - 2009
- Kerr-McGee - 2008
- Montrose - 2008
- Montrose - 2009
- OSM - 2009

- POSSOM - 2008
- Stauffer - 2006
- Stauffer - 2008
- Stauffer - 2009
- TIMET - 2006
- TIMET - 2008
- TIMET - 2009
- Tronox - 2006
- Tronox - 2008

-  Site boundary
- Gravel pit circa 1976.
-  Source: Aerial photograph dated 1976
-  TIMET boundary
-  Tronox boundary
-  POSSM (The Companies)
-  Site AOC3 boundary
-  Las Vegas Wash

-  TIMET proposed slurry wall
-  Tronox groundwater recharge trench
-  Tronox slurry wall
-  Street
-  Concentration contour (dashed where inferred)
-  MCL = 5 ug/L
-  BCL = 5 ug/L

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 5 ug/L
5. BCL = 5 ug/L

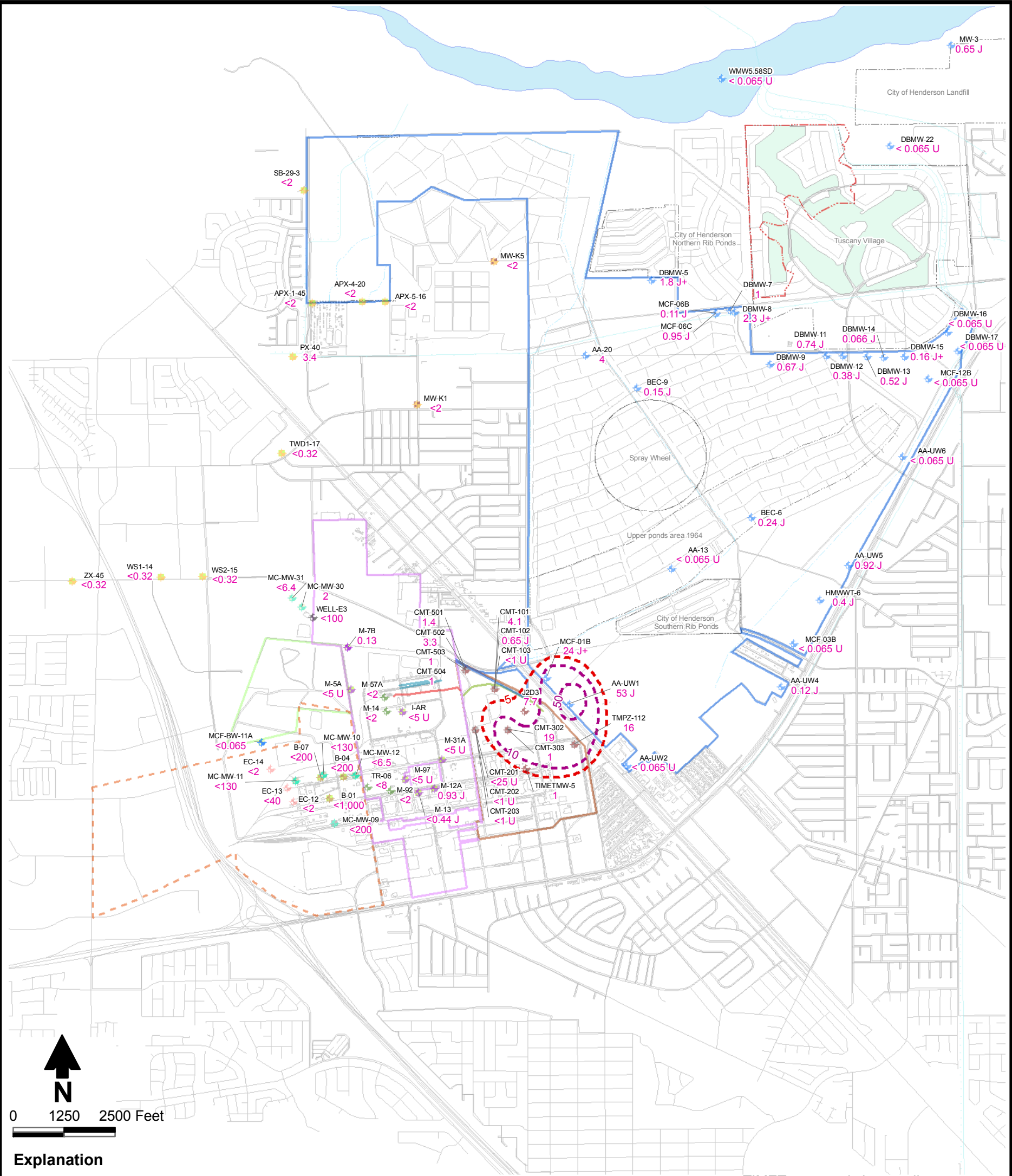
PCE
Shallow Zone Layer 1

Prepared by:

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/PCE_LAYER1.MXD 016040

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/PCE_LAYER1.MXD 016040



Explanation

Well Site - Date of Data

- | | |
|-------------------|-----------------|
| AMPAC - 2004 | Olin - 2008 |
| AMPAC - 2008 | POSSOM - 2008 |
| BRC - 2008 | Stauffer - 2009 |
| BRC - 2009 | TIMET - 2008 |
| Kerr-McGee - 2008 | TIMET - 2009 |
| Montrose - 2008 | Tronox - 2006 |
| Montrose - 2009 | Tronox- 2009 |

TMPZ-112
16 Monitoring well designation
Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET,2008b; TIMET,2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 5 ug/L
5. BCL = 5 ug/L

- | | |
|---|--|
| Site boundary | TIMET proposed slurry wall
September 2008 |
| Gravel pit circa 1976.
Source: Aerial photograph
dated 1976 | Tronox groundwater
recharge trench |
| TIMET boundary | Tronox slurry wall |
| Tronox boundary | Street |
| POSSM (The Companies) | Concentration contour
(dashed where inferred) |
| Site AOC3 boundary | MCL = 5 ug/L |
| Las Vegas Wash | BCL = 5 ug/L |

BMI Common Areas (Eastside)
Henderson, Nevada

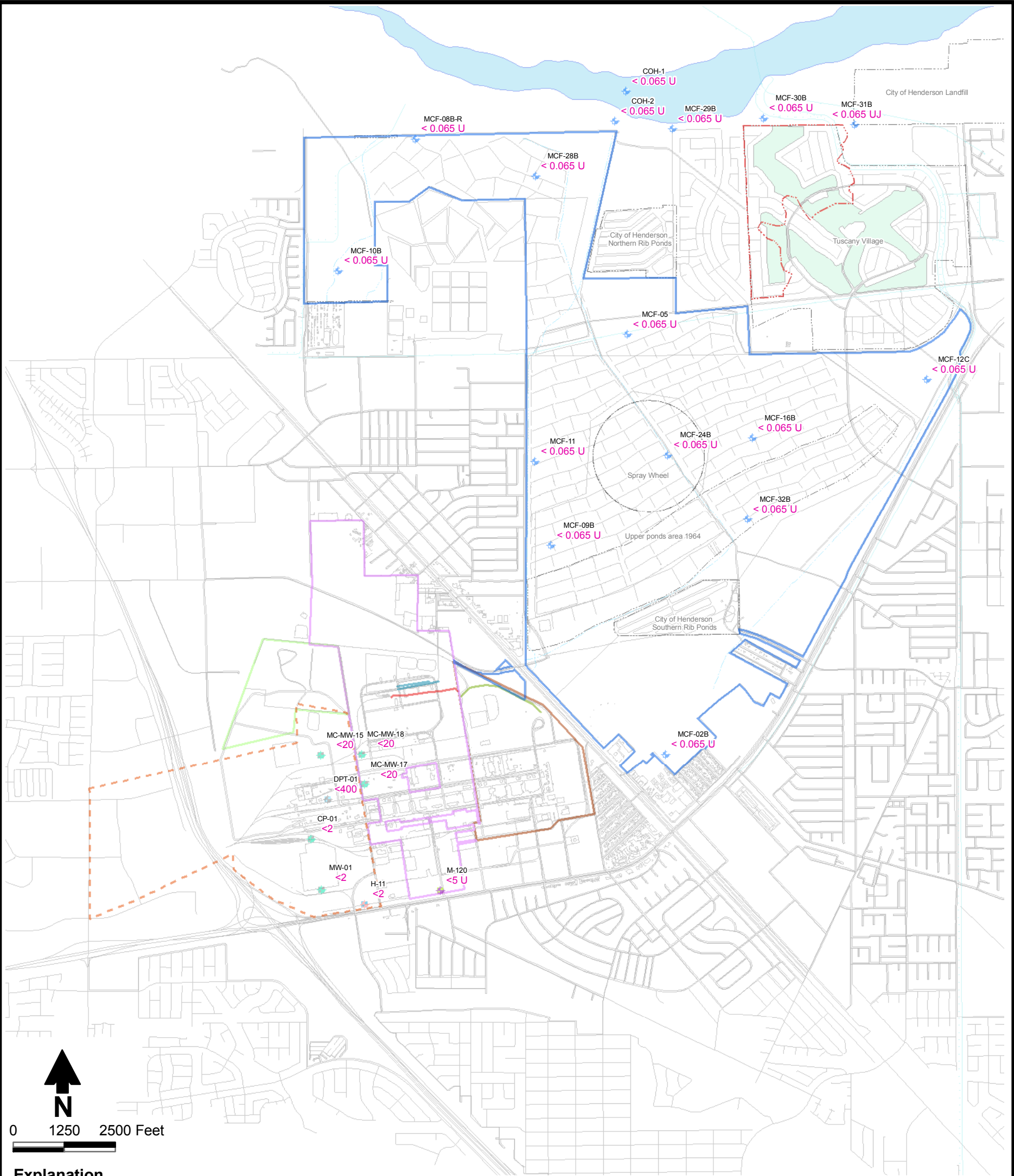
PCE
Shallow Zone Layer 2



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/PCE_LAYER2.MXD 010240



Explanation

Well Site - Date of Data

- Site not known - 2008
- BRC - 2009
- Montrose - 2008
- Montrose - 2009
- Stauffer - 2008
- Tronox - 2006

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 5 ug/L
4. BCL = 5 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

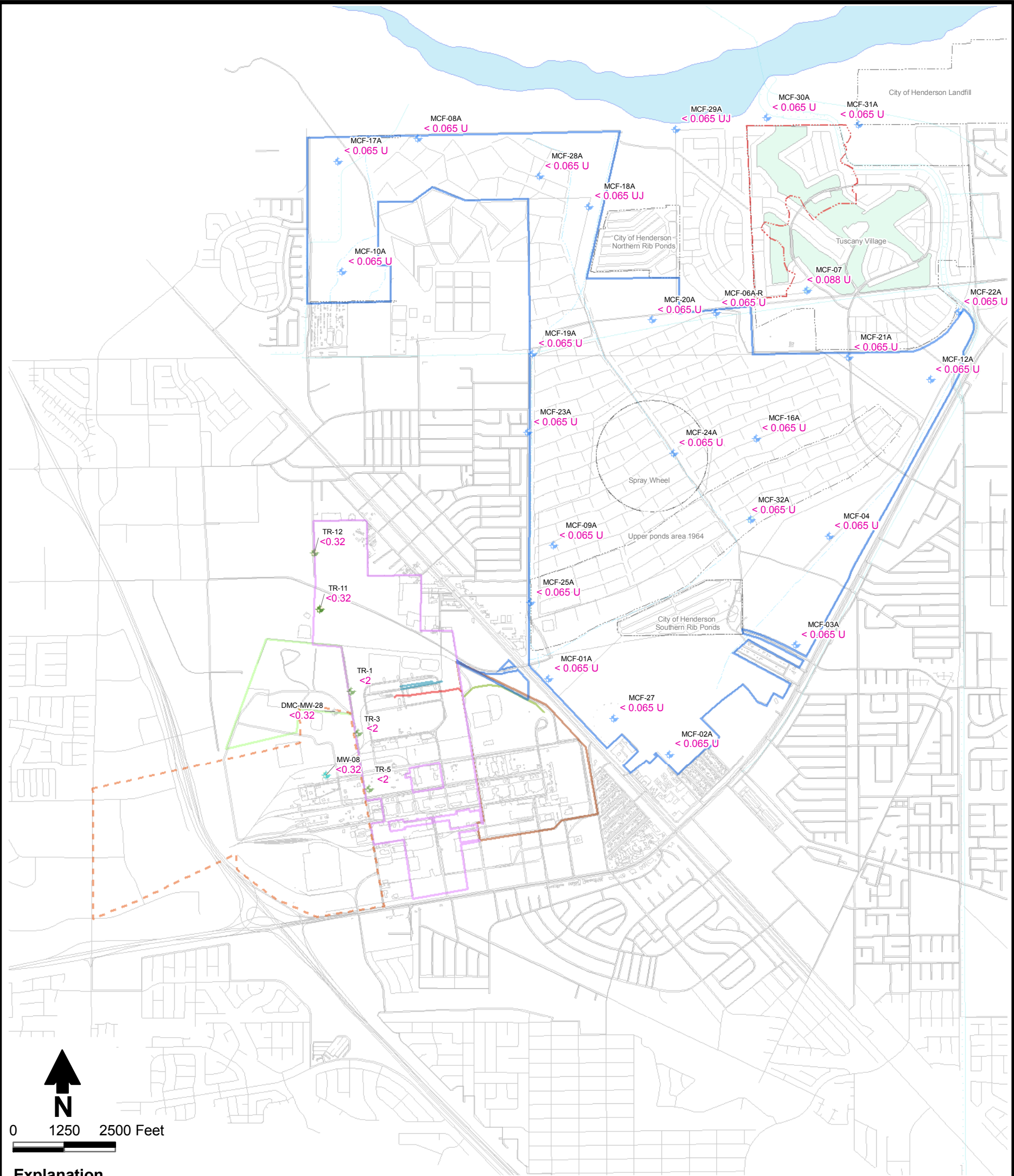
PCE
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/PCE_middle.MXD 016040



Explanation

Well Site - Date of Data

- Site not known - 2009
- BRC - 2009
- BRC - 2010
- City of Henderson - 2008
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 5 ug/L
4. BCL = 5 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

PCE
Deep Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/PCE_deep.MXD 016040

BRW-R1
43

Monitoring well designation
Result (ug/L)

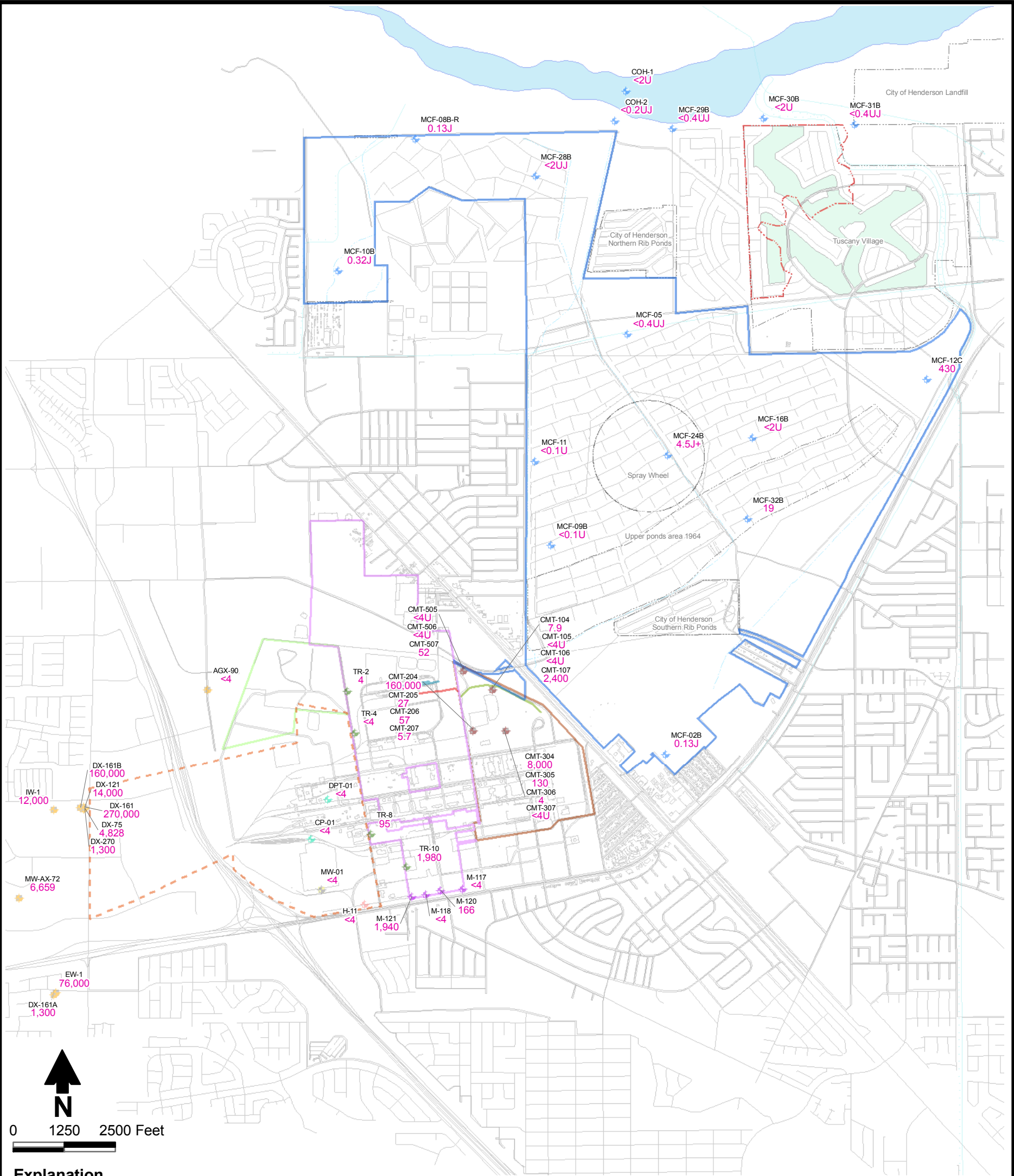
- References:
1. BRC, 2010
 2. CAMU, 2009
 3. NDEP, 2010
 4. TIMET,2008b; TIMET,2010
 5. Tronox LLC, 2009
 6. Kerr-McGee Chemical LLC, 2005

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. Tronox Source Area Groundwater Extraction/Treatment/Re-injection System
3. Tronox Seep Area Groundwater Extraction System
4. Tronox Athens Road Area Groundwater Extraction System
5. This parameter has no MCL
6. MCL = USEPA Maximum Contaminant Level
7. BCL = Basic Comparison Level
8. BCL = 18 ug/L

Basic Remediation
C O M P A N Y

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/Perchlorate_LAYER1.MXD 016040

BMI Common Areas (Eastside) Henderson, Nevada		
Perchlorate Shallow Zone Layer 2		
Prepared by: DBS&A AFM	Date 09-14-10	S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\PERCHLORATE_LAYER2.MXD 012240



Explanation

Well Site - Date of Data

- Site not known - 2007
- AMPAC - 2005
- BRC - 2009
- Kerr-McGee - 2009
- Montrose - 2007
- Stauffer - 2009
- TIMET - 2008
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET,2008b
4. Tronox LLC, 2009

Notes:

1. This parameter has no MCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. BCL = 18 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

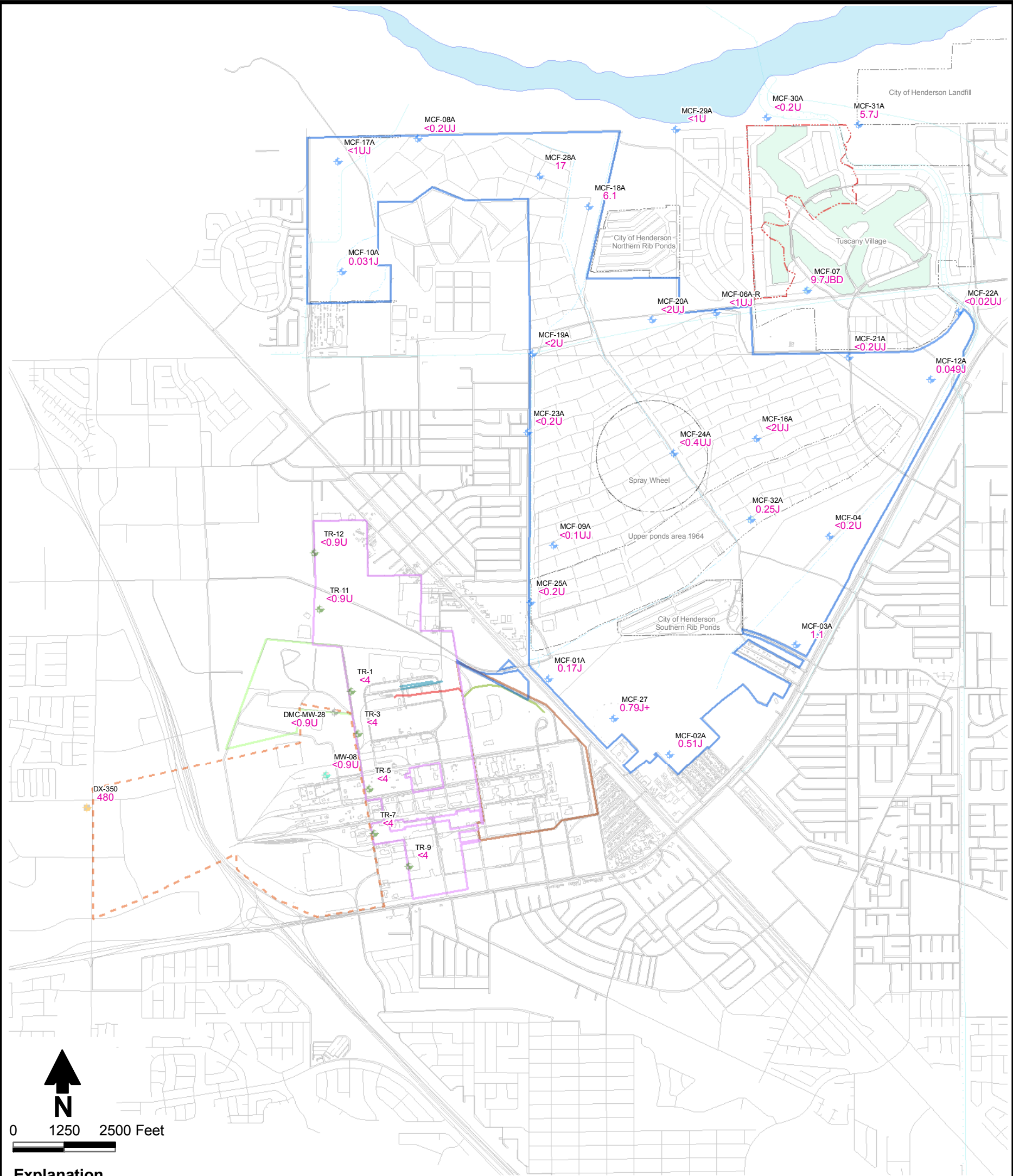
Perchlorate
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:\PROJECTS\BRC\ES09.0281_BRC_WH_AND_PRE-CSM_TASKS\GIS\MXDS\CHEMISTRY\ LAYER_MODEL\PERCHLORATE_MIDDLE.MXD 012240



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2005
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

- BRC, 2010
- NDEP, 2010
- Tronox LLC, 2009

Notes:

- This parameter has no MCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- BCL = 18 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

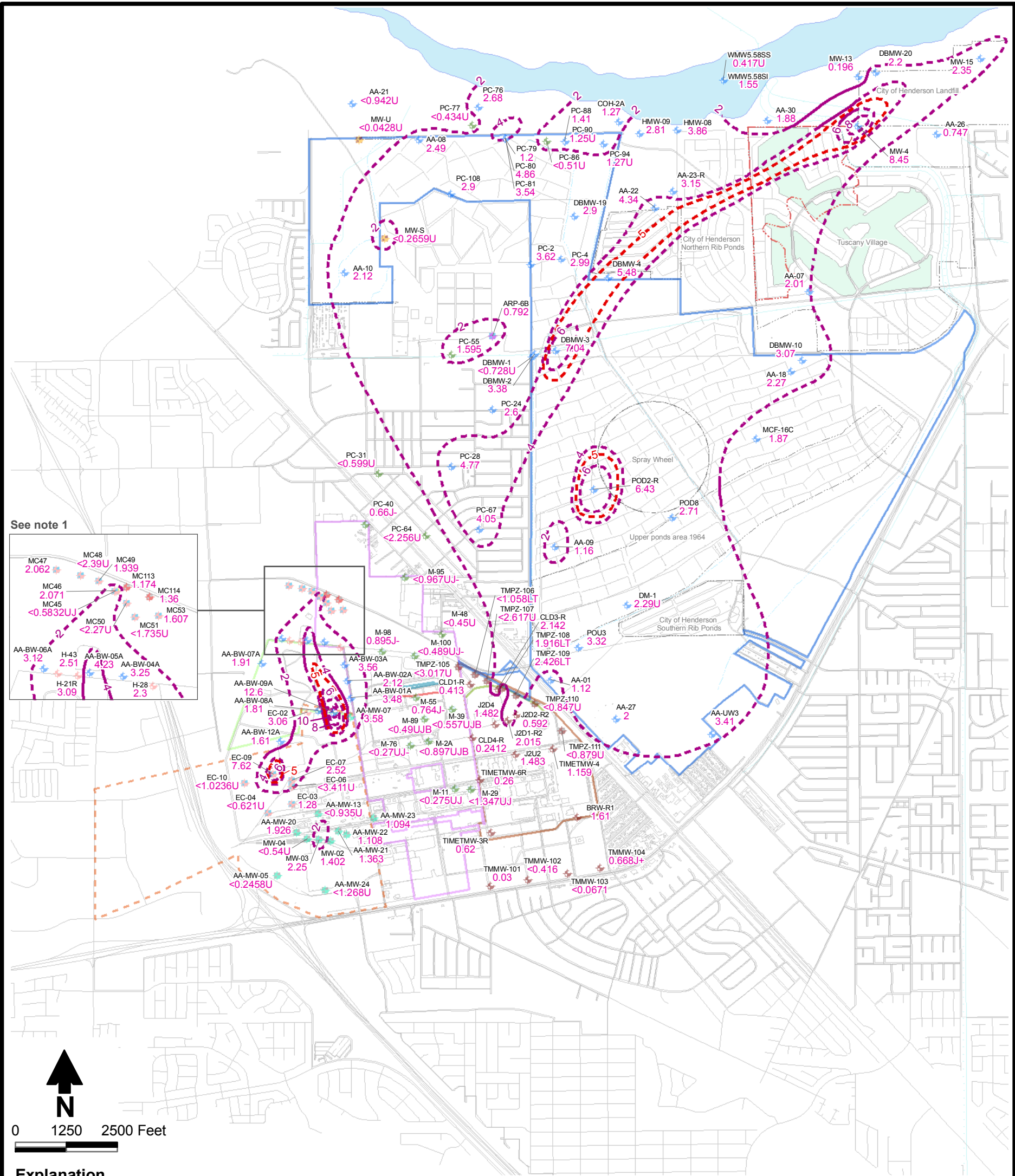
Perchlorate
Deep Zone



Prepared by:
DBS&A AFM

Date
09-14-10

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Explanation

Well Site - Date of Data

- AMPAC - 2008
- BRC - 2009
- Kerr-McGee - 2006
- Kerr-McGee - 2008
- Montrose - 2008
- Montrose - 2009

EC-07
2.52
Monitoring well designation
Result (pCi/L)

- OSM - 2008
- Stauffer - 2006
- Stauffer - 2008
- Stauffer - 2009
- TIMET - 2008
- TIMET - 2009
- Tronox - 2008

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 5 pCi/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2008a; TIMET,2008b; TIMET,2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. This parameter has no BCL
3. MCL = USEPA Maximum Contaminant Level
4. BCL = Basic Comparison Level
5. MCL = 5 pCi/L

BMI Common Areas (Eastside)
Henderson, Nevada

Radium 226+228
Shallow Zone Layer 1

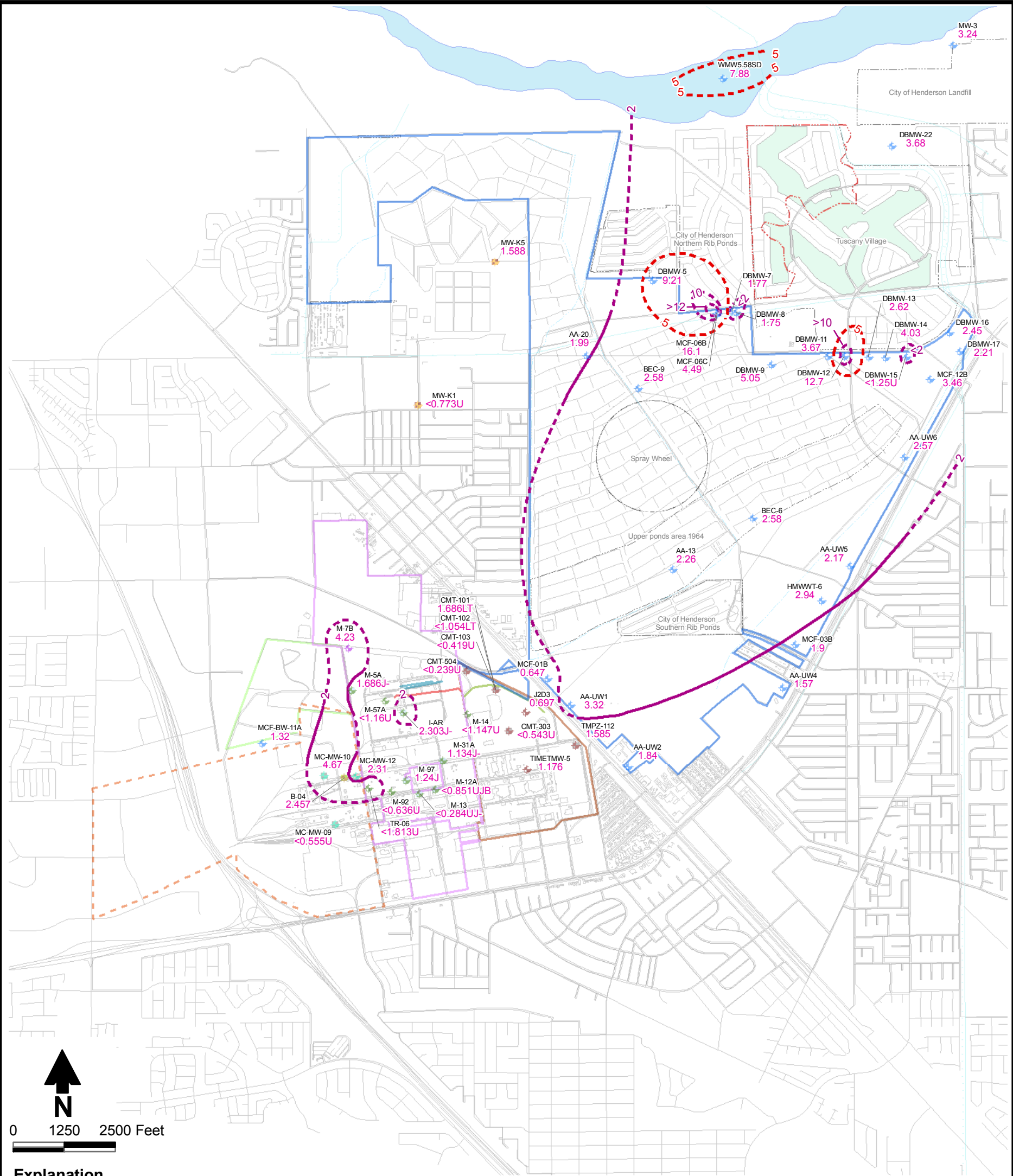
Prepared by:
DBS&A AFM

Date
09-14-10

Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/RADIUM226+228_LAYER1.MXD 016040



Explanation

Well Site - Date of Data

AMPAC - 2008

BRC - 2009

Kerr-McGee - 2006

Kerr-McGee - 2008

Montrose - 2008

M-10
620
Monitoring well designation
Result (pCi/L)

Montrose - 2009

Olin - 2008

TIMET - 2008

TIMET - 2009

TRONOX - 2009

Site boundary

Gravel pit circa 1976.

Source: Aerial photograph
dated 1976

TIMET boundary

Tronox boundary

POSSM (The Companies)

Site AOC3 boundary

Las Vegas Wash

TIMET proposed slurry wall
September 2008

Tronox groundwater
recharge trench

Tronox slurry wall

Street

Concentration contour
(dashed where inferred)

MCL = 5 pCi/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2008b; TIMET, 2010

Notes:

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 5 pCi/L

BMI Common Areas (Eastside)
Henderson, Nevada

Radium 226+228
Shallow Zone Layer 2

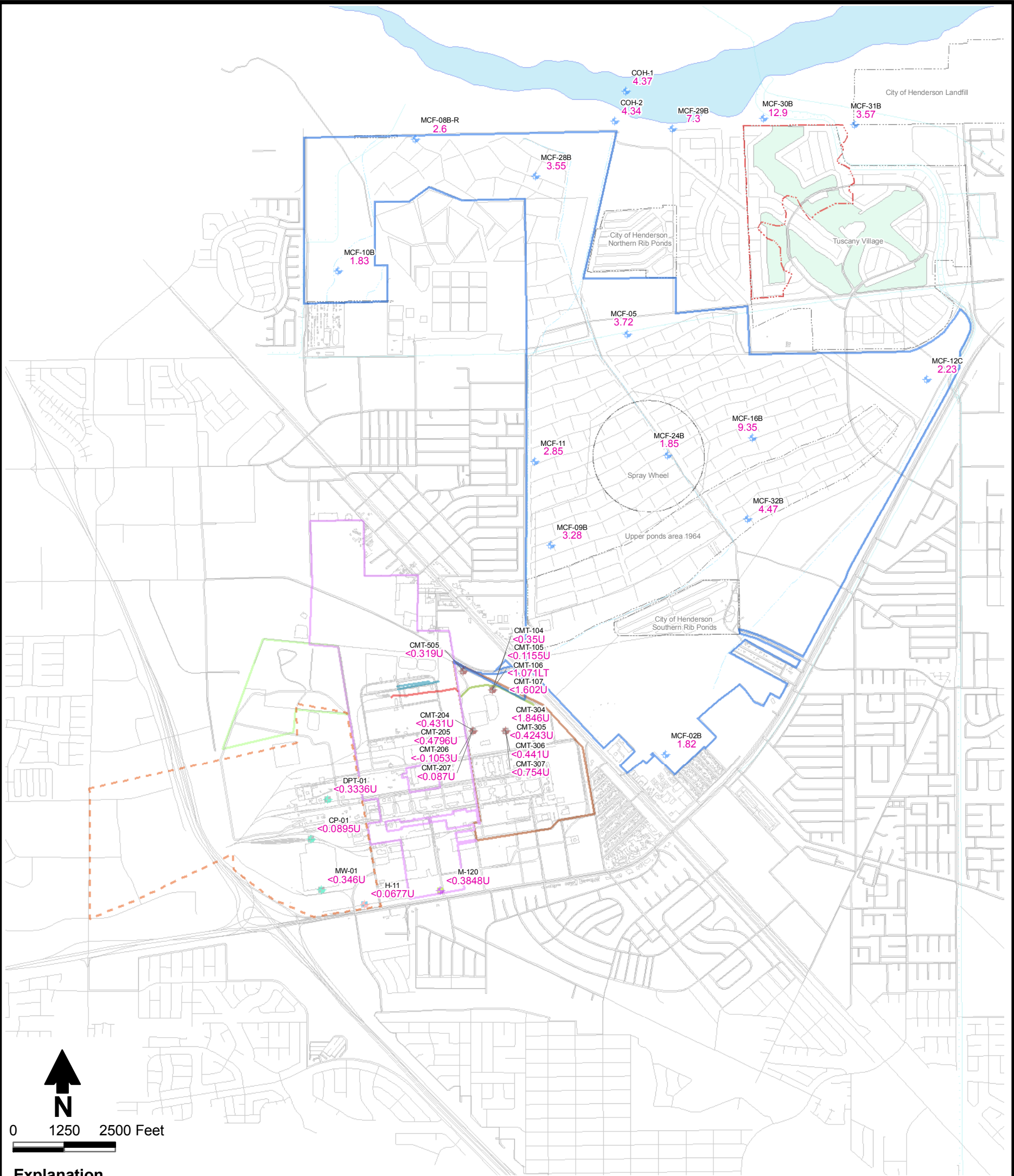
Prepared by:
DBS&A AFM

Date
09-14-10

Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/RADIUM226+228_LAYER2.MXD 016240



Explanation

Well Site - Date of Data

- BRC - 2009
- Montrose - 2008
- Stauffer, 2008
- TIMET - 2008
- Tronox, 2006

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (pCi/L)

References:

- BRC, 2010
- NDEP, 2010
- TIMET,2008b

Notes:

- This parameter has no BCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 5 pCi/L

BMI Common Areas (Eastside)
Henderson, Nevada

Radium 226+228
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

S:/PROJECTS/BRC/ES09.0281_BRC_WH_AND_PRE-CSM_TASKS/
GIS/MXDS/CHEMISTRY/
LAYER_MODEL/RADIUM226+228_MIDDLE.MXD 016240

-  TIMET proposed slurry wall
-  Tronox groundwater recharge trench
-  Tronox slurry wall
-  Street
-  Concentration contour (dashed where inferred)
-  MCL = 5 pCi/L

1. BRC, 2010
2. NDEP, 2010

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 5 pCi/L

BMI Common Areas (Eastside)
Henderson, Nevada

Radium 226+228
Deep Zone

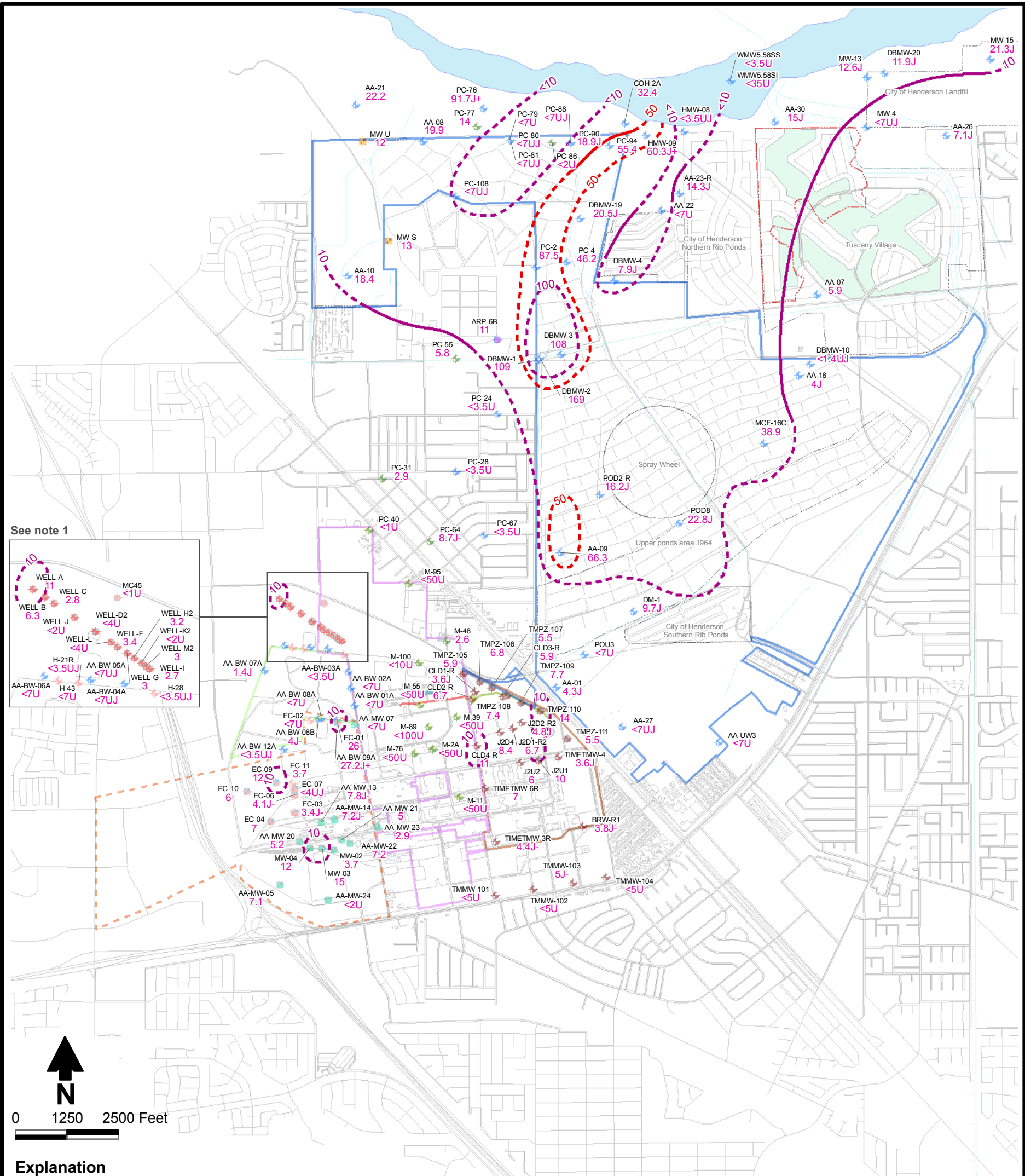
Prepared by:

 **DBS&A** **AFM**

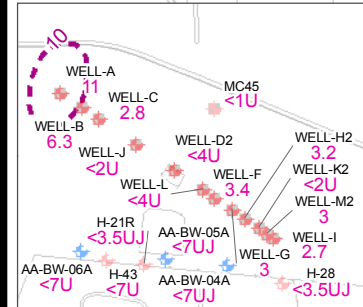
Date
09-14-10


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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/RADIUM226+228_DEEP.MXD 016040



See note 1



Explanation

Well Site - Date of Data

- AMPAC - 2008
- BRC - 2008
- BRC - 2009
- Kerr-McGee - 2007
- Kerr-McGee - 2008
- Montrose - 2008
- Montrose - 2009
- OSM - 2008

- Stauffer - 2007
- Stauffer - 2008
- Stauffer - 2009
- TIMET - 2006
- TIMET - 2007
- TIMET - 2008
- TIMET - 2009
- Tronox - 2008

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 50 ug/L
- BCL = 50 ug/L

MW-02
3.7
Monitoring well designation
Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2008a; TIMET,2008b; TIMET,2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 50 ug/L
5. BCL = 50 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

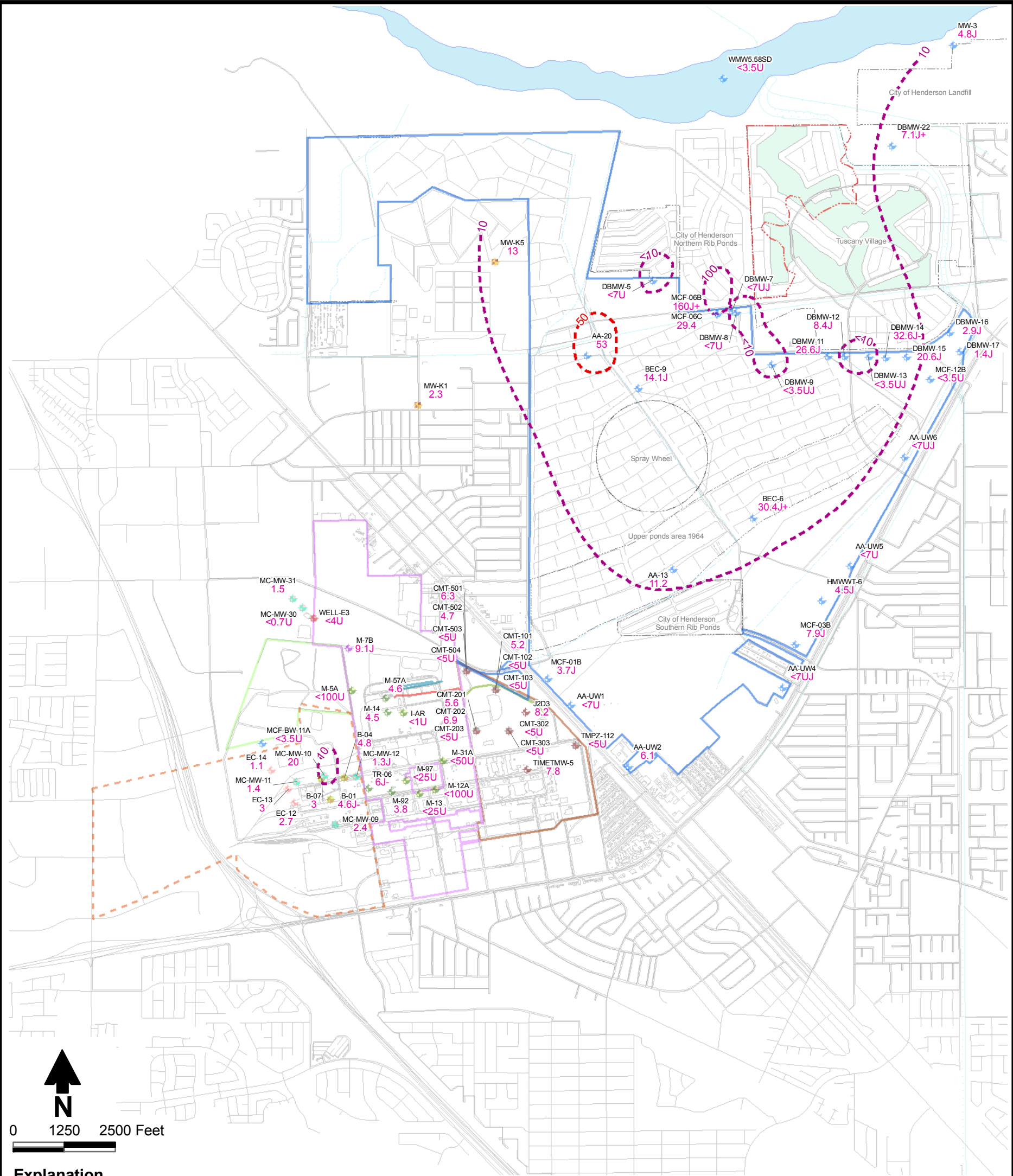
Selenium
Shallow Zone Layer 1



Prepared by:
DBS&A AFM

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/SELENIUM_LAYER1.MXD 016040



Explanation

Well Site - Date of Data

- AMPAC - 2008
- BRC - 2009
- Kerr-McGee - 2007
- Kerr-McGee - 2008
- Montrose - 2008
- Montrose - 2009
- Monitoring well designation
- Result (ug/L)

- OSM - 2008
- Olin, 2008
- Stauffer - 2009
- TIMET - 2008
- TIMET - 2009
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 50 ug/L
- BCL = 50 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET,2008b; TIMET,2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 50 ug/L
4. BCL = 50 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

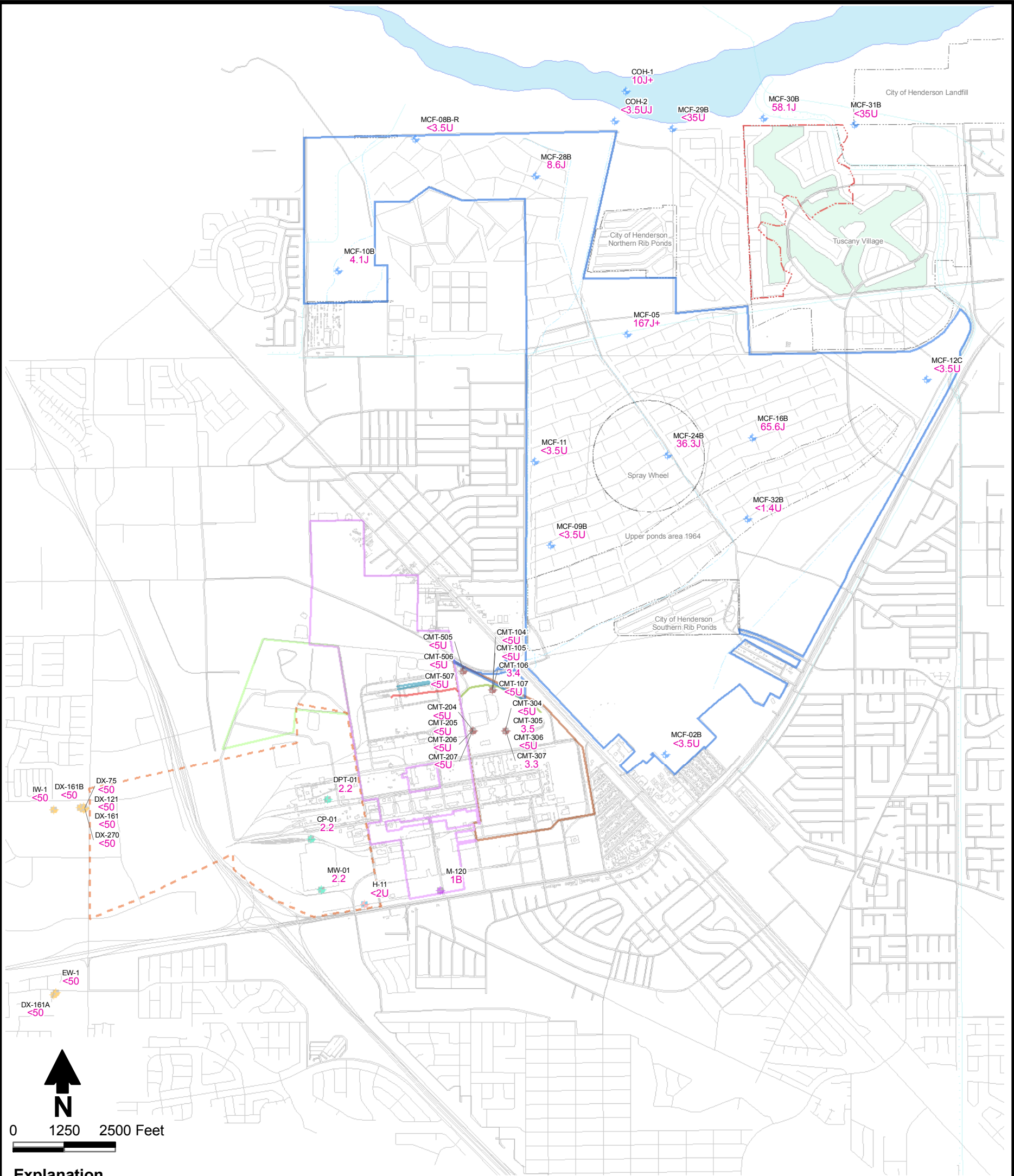
Selenium
Shallow Zone Layer 2



Prepared by:
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Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/SELENIUM_LAYER2.MXD 016240



Explanation

Well Site - Date of Data

- AMPAC - 2005
- BRC - 2009
- Montrose - 2008
- Stauffer - 2008
- TIMET - 2008
- Tronox - 2007

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET, 2008b

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 50 ug/L
4. BCL = 50 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

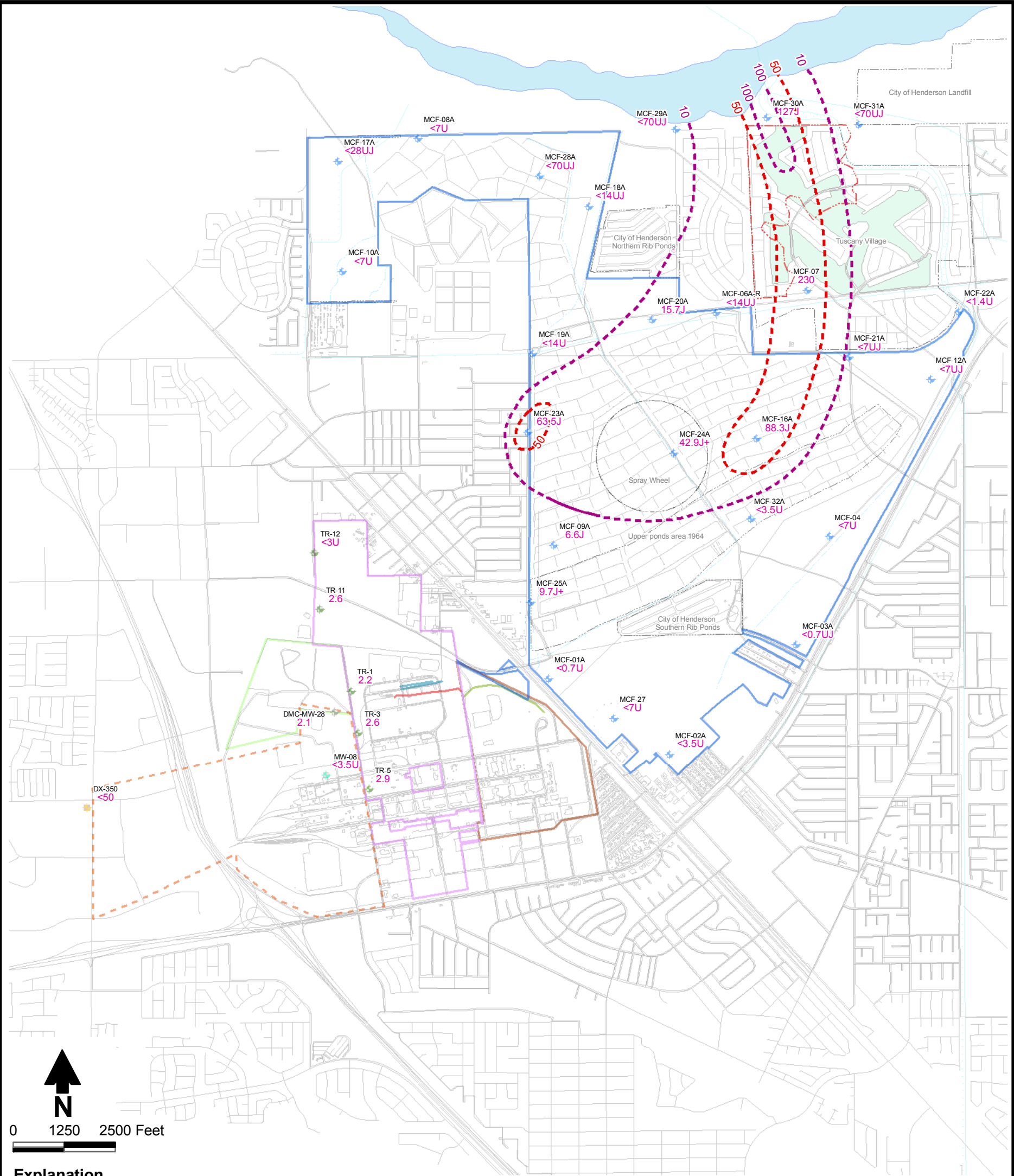
Selenium
Middle Zone



Prepared by:
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Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/SELENIUM_MIDDLE.MXD 016240



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2005
- BRC - 2009
- BRC - 2010
- Kerr-McGee - 2008
- Kerr-McGee - 2009
- Montrose - 2009

MW-08
<3.5U
Monitoring well designation
Result (ug/L)

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 50 ug/L
- BCL = 50 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 50 ug/L
4. BCL = 50 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Selenium
Deep Zone

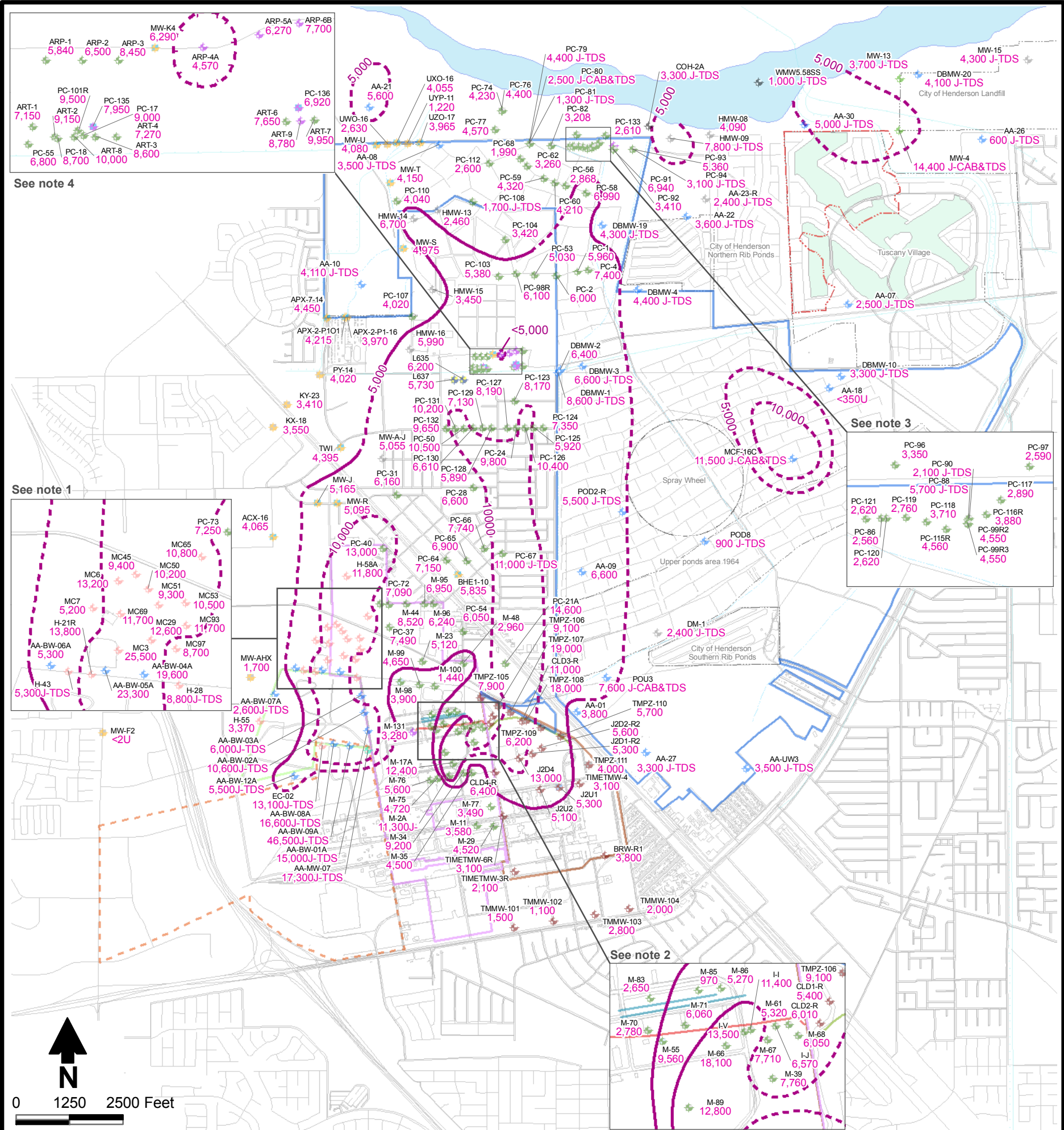
Prepared by:
DBS&A AFM

Date
09-14-10

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& Associates, Inc.

Basic Remediation
COMPANY

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/SELENIUM_DEEP.MXD 016040



Explanation

Well Site - Date of Data		
Site not known - 2006	Site not known - 2009	Montrose, 2009
Site not known - 2009	SNWA - 2009	
AMPAC - 2005	Stauffer - 2009	
AMPAC - 2009	TIMET - 2006	
BRC - 2009	TIMET - 2008	
City of Henderson - 2009	TIMET - 2009	
Kerr-McGee, 2006	Tronox - 2008	
Kerr-McGee - 2008	Tronox - 2009	
Kerr-McGee - 2009	US Bureau of Reclamation - 2009	
	US EPA - 2009	
M-75 4,720	Monitoring well designation	
	Result (mg/L)	

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash
- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)

- References:
- BRC, 2010
 - CAMU, 2009
 - NDEP, 2010
 - TIMET, 2008a; TIMET,2008b; TIMET,2010
 - TRONOX LLC, 2009

- Notes:
- POSSM Groundwater Extraction/Air Stripping/Re-injection System
 - Tronox Source Area Groundwater Extraction/Treatment/Re-injection System
 - Tronox Seep Area Groundwater Extraction System
 - Tronox Athens Road Area Groundwater Extraction System
 - This parameter has no BCL
 - MCL = USEPA Maximum Contaminant Level
 - BCL = Basic Comparison Level
 - MCL = 500 mg/L secondary standard

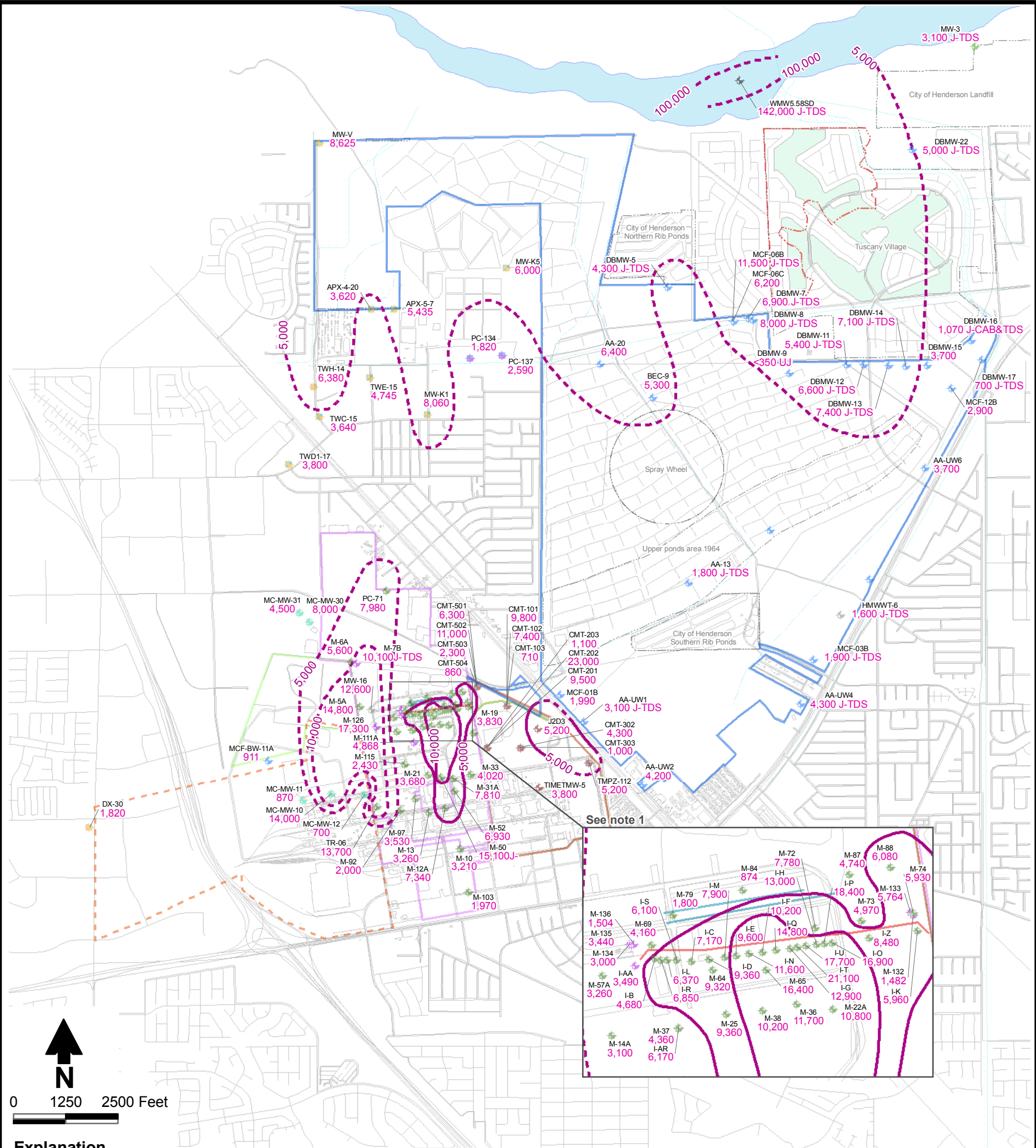
BMI Common Areas (Eastside)
Henderson, Nevada

TDS
Shallow Zone Layer 1

Prepared by: DBS&A AFM Date: 09-17-10

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Daniel B. Stephens & Associates, Inc.
Basic Remediation
COMPANY



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2004
- AMPAC - 2005
- AMPAC - 2009
- BRC - 2009
- City of Henderson - 2009
- Kerr-McGee - 2006
- Kerr-McGee - 2009
- M-10
3,210
Monitoring well designation
Result (mg/L)

- Montrose - 2009
- SNWA - 2009
- Stauffer - 2009
- TIMET - 2006
- TIMET - 2008
- TIMET - 2009
- TRONOX - 2009
- Tronox - 2008
- Tronox - 2009

- Site boundary
- Gravel pit circa 1976.
Source: Aerial photograph
dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall
September 2008
- Tronox groundwater
recharge trench
- Tronox slurry wall
- Street
- Concentration contour
(dashed where inferred)

References:

- BRC, 2010
- CAMU, 2009
- NDEP, 2010
- TIMET,2008b; TIMET,2010
- TRONOX LLC, 2009

Notes:

- Tronox Source Area Groundwater Extraction/Treatment/Re-injection System
- This parameter has no BCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 500 mg/L secondary standard

BMI Common Areas (Eastside)
Henderson, Nevada

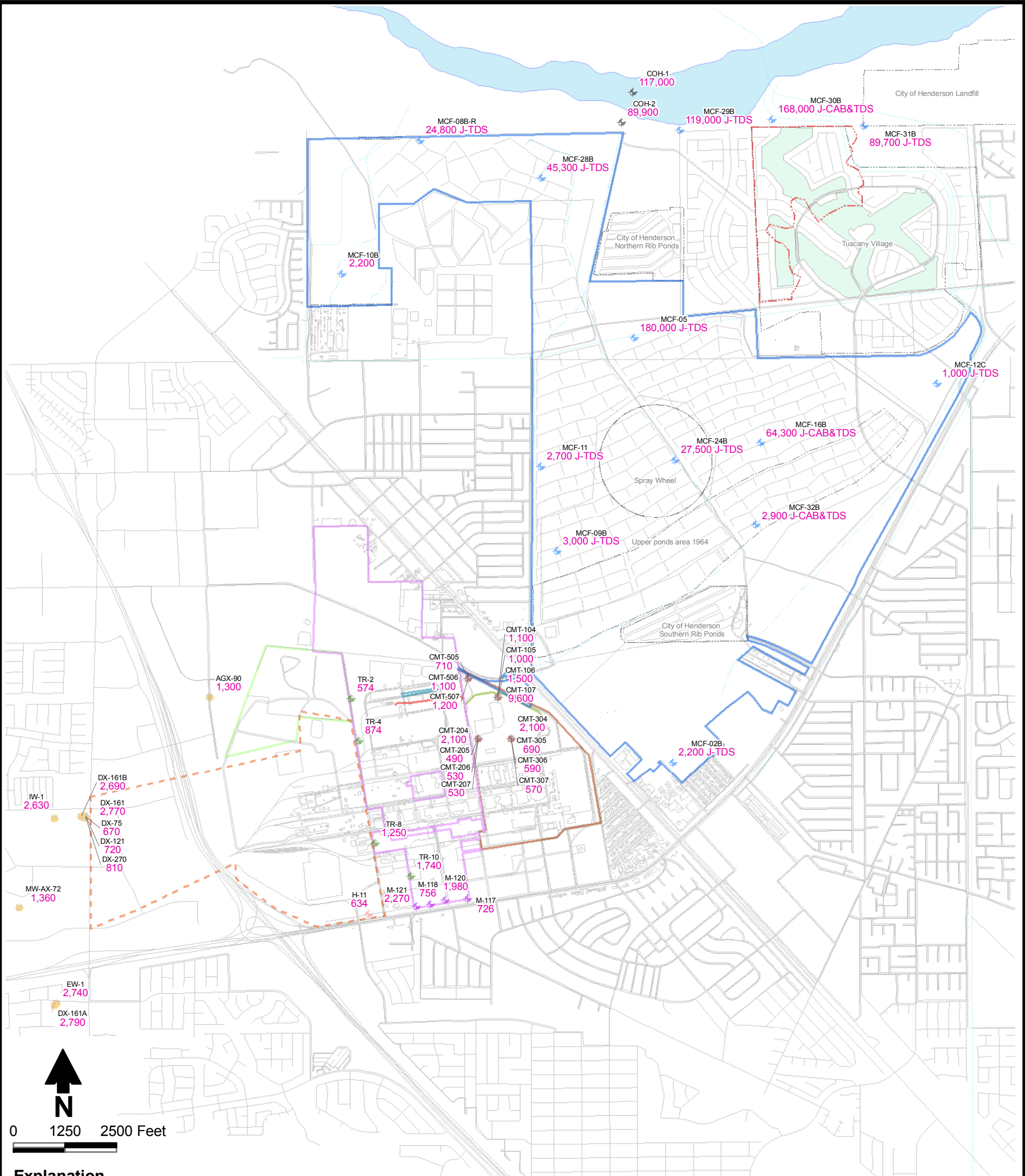
TDS
Shallow Zone Layer 2



Prepared by:
DBS&A AFM

Date
09-17-10

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Explanation

Well Site - Date of Data

- AMPAC - 2004
- AMPAC - 2005
- BRC - 2009
- Kerr-McGee - 2009
- SNWA - 2009
- Stauffer - 2009
- TIMET - 2008
- Tronox - 2006
- Tronox - 2009

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET,2008b;
5. TRONOX LLC, 2009

Notes:

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 500 mg/L secondary standard

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (mg/L)

BMI Common Areas (Eastside)
Henderson, Nevada

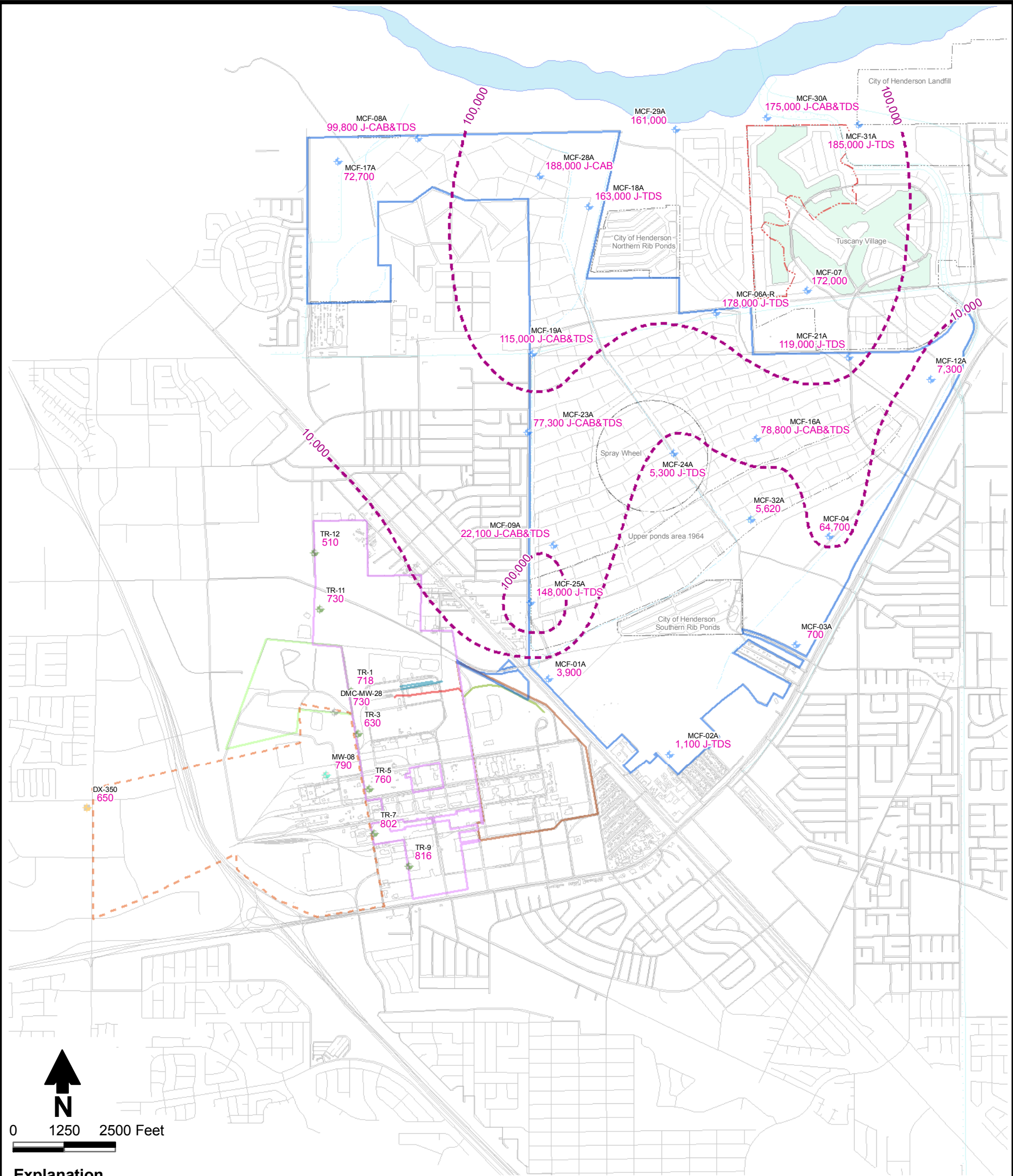
TDS
Middle Zone



Prepared by:
DBS&A AFM

Date
09-17-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/TDS_MIDDLE.MXD 016240



Explanation

Well Site - Date of Data

- Montrose - 2009
- Kerr-McGee - 2009
- BRC - 2009
- BRC - 2010
- AMPAC - 2005
- Site not known - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (mg/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TRONOX LLC, 2009

Notes:

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 500 mg/L secondary standard

BMI Common Areas (Eastside)
Henderson, Nevada

TDS
Deep Zone

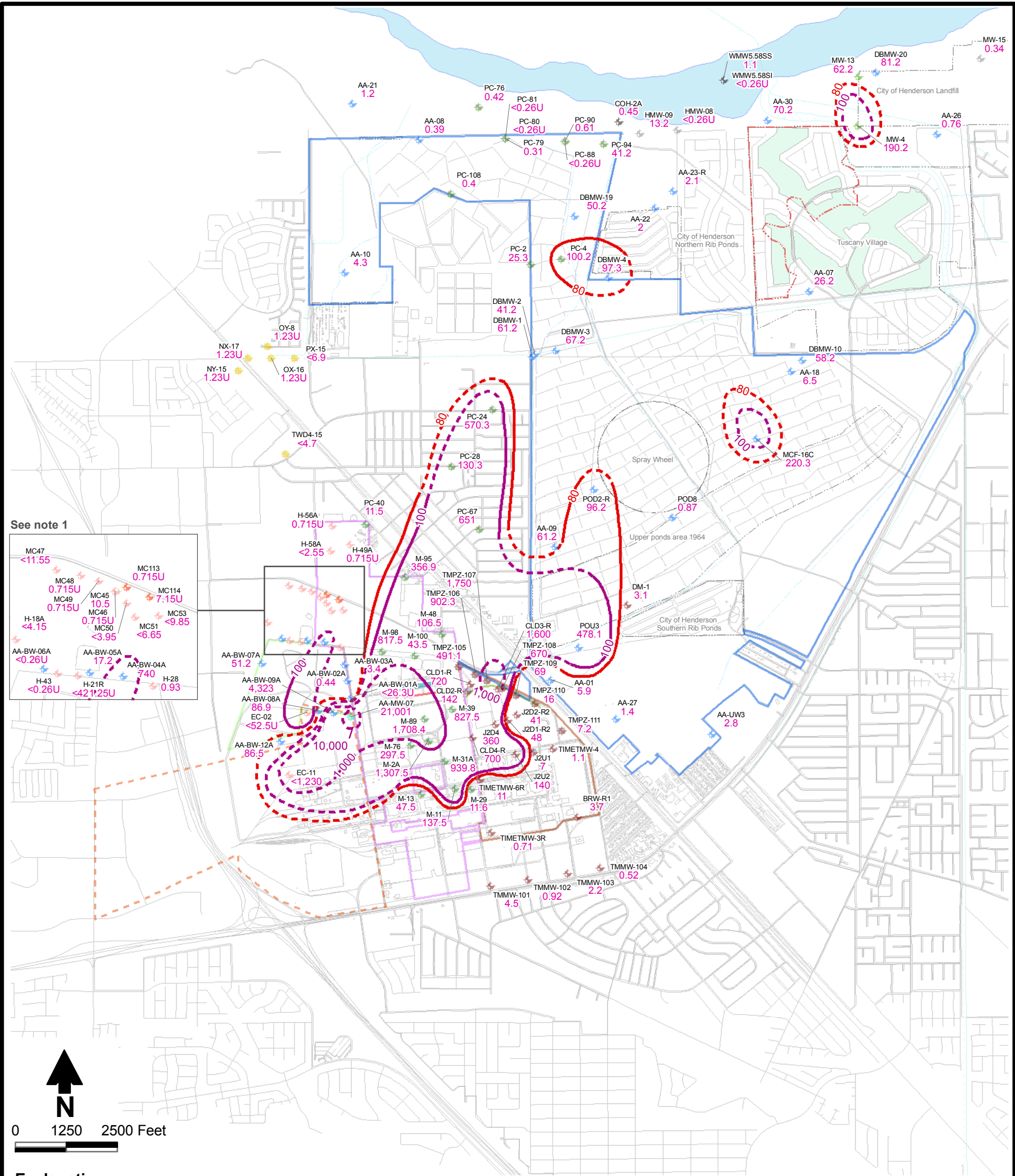
Daniel B. Stephens
& Associates, Inc.

Basic Remediation
COMPANY

Prepared by:
DBS&A AFM

Date
09-17-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/TDS_DEEP.MXD 014050



Explanation

Well Site - Date of Data

- Site not known - 2009
- AMPAC - 2004
- BRC - 2009
- City of Henderson - 2009
- Kerr-McGee - 2006
- Kerr-McGee - 2009
- Montrose - 2009

MW-02
3.7
Monitoring well designation
Result (ug/L)

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET, 2008a; TIMET,2008b; TIMET,2010

Notes:

1. POSSM Groundwater Extraction/Air Stripping/Re-injection System
2. This parameter has no BCL
3. MCL = USEPA Maximum Contaminant Level
4. BCL = Basic Comparison Level
5. MCL = 80 ug/L

- OSM - 2009
- SNWA - 2009
- Stauffer - 2006
- Stauffer - 2009
- TIMET, 2006
- TIMET - 2008
- TIMET - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 80 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

TTHMs
Shallow Zone Layer 1

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Basic Remediation
COMPANY

Prepared by:
DBS&A AFM

Date
09-14-10

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-  TIMET proposed slurry wall
-  Tronox groundwater recharge trench
-  Tronox slurry wall
-  Street
-  Concentration contour (dashed where inferred)
-  MCL = 80 ug/L

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010
4. TIMET,2008b; TIMET,2010

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 80 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

TTHMs
Shallow Zone Layer 2



Basic Remediation
C O M P A N Y

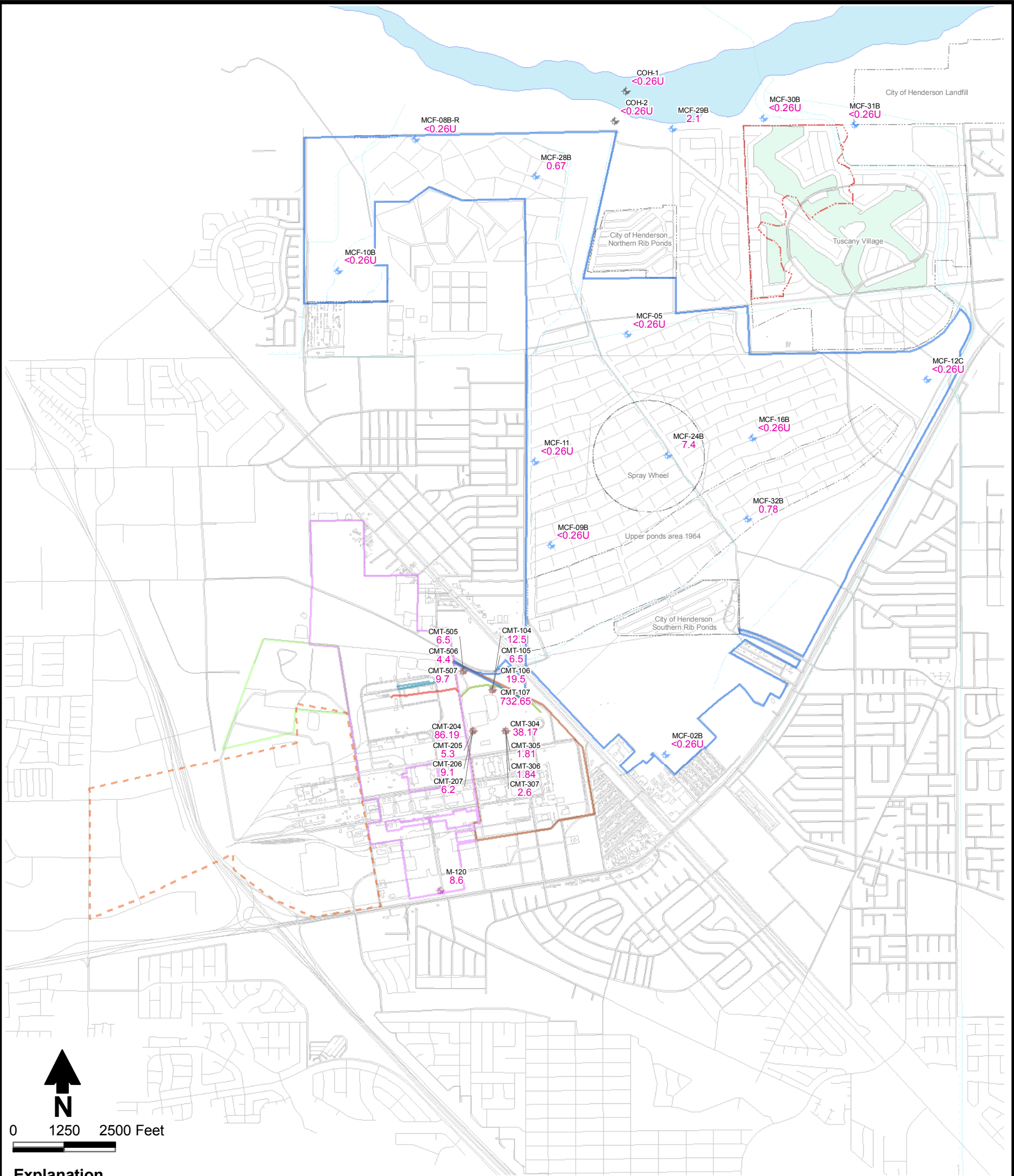
Prepared by:



Date _____

09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/TTHMS_LAYER2.MXD 013050



Explanation

Well Site - Date of Data

- AMPAC - 2004
- BRC - 2009
- SNWA - 2009
- TIMET - 2008
- Tronox - 2006

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation
- Result (ug/L)

References:

1. BRC, 2010
2. NDEP, 2010
3. TIMET, 2008b

Notes:

1. This parameter has no BCL
2. MCL = USEPA Maximum Contaminant Level
3. BCL = Basic Comparison Level
4. MCL = 80 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

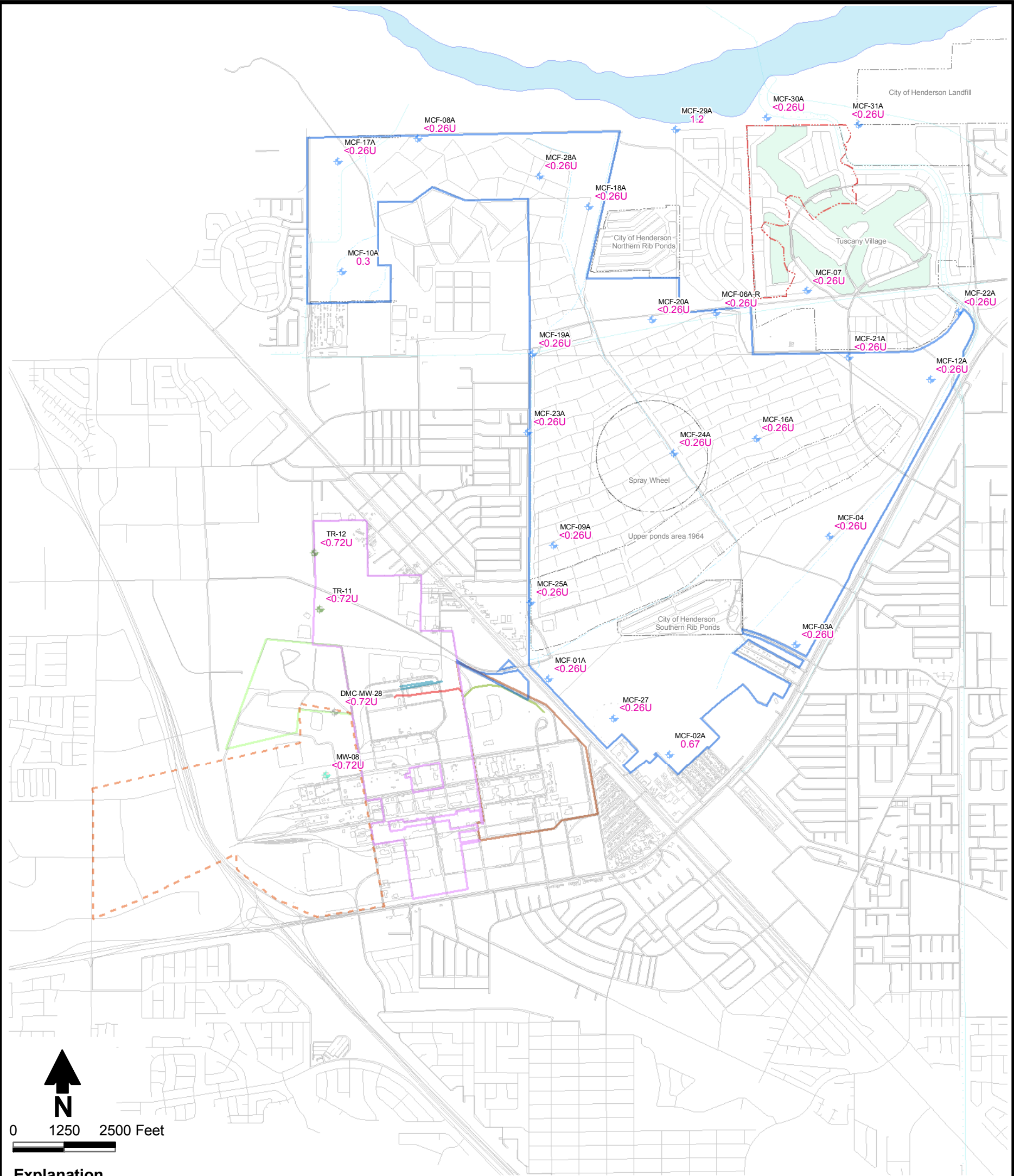
TTTHMs
Middle Zone



Prepared by:
DBS&A AFM

Date
09-14-10

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/TTTHMS_MIDDLE.MXD 016240



Explanation

Well Site - Date of Data

- Site not known - 2009
- BRC - 2009
- Kerr-McGee - 2009
- Montrose - 2009

- Site boundary
- Gravel pit circa 1976.
- Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Monitoring well designation Result (ug/L)

References:

- BRC, 2010
- CAMU, 2009

Notes:

- This parameter has no BCL
- MCL = USEPA Maximum Contaminant Level
- BCL = Basic Comparison Level
- MCL = 80 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

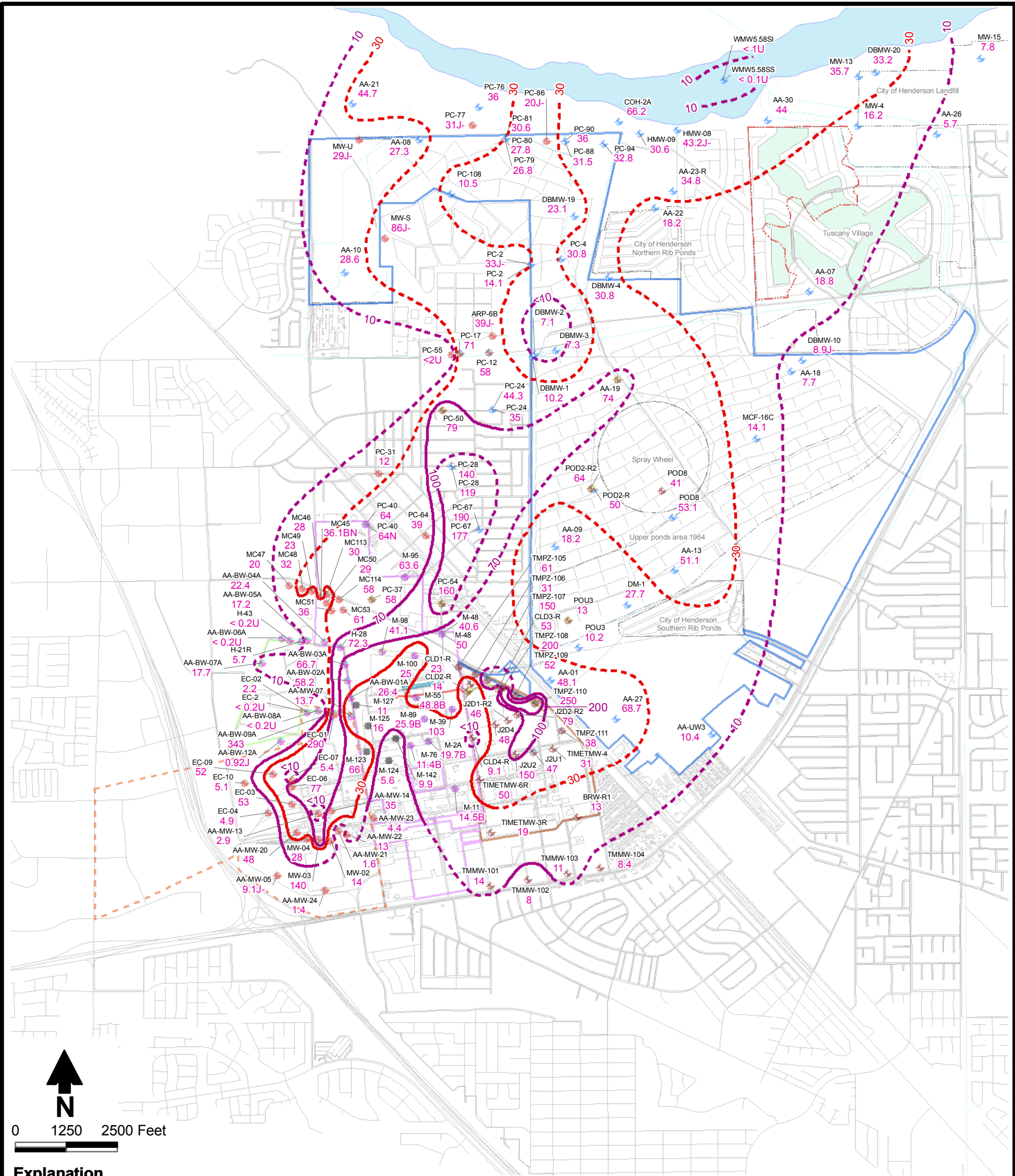
TTHMs
Deep Zone



Prepared by:
DBS&A AFM

Date
09-14-10

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Explanation

Well Site - Date of Data

- BRC - 2009
- CAMU - 2009
- POSSOM - 2008
- TIMET - 2005
- TIMET - 2006

MW-04
28 Monitoring well designation
Result (ug/L)

- TIMET - 2007
- TIMET - 2008
- TIMET - 2009
- TRONOX - 2006
- TRONOX - 2007
- Unknown layer

- Site boundary
- Gravel pit circa 1976. Source: Aerial photograph dated 1976
- TIMET boundary
- Tronox boundary
- POSSM (The Companies)
- Site AOC3 boundary
- Las Vegas Wash

- TIMET proposed slurry wall September 2008
- Tronox groundwater recharge trench
- Tronox slurry wall
- Street
- Concentration contour (dashed where inferred)
- MCL = 30 ug/L
- BCL = 30 ug/L

References:

1. BRC, 2010
2. CAMU, 2009
3. NDEP, 2010

Notes:

1. MCL = USEPA Maximum Contaminant Level
2. BCL = Basic Comparison Level
3. MCL = 30 ug/L
4. BCL = 30 ug/L

BMI Common Areas (Eastside)
Henderson, Nevada

Uranium
Shallow Zone Layer 1



Prepared by:
DBS&A AFM

Date
09-14-10

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LAYER_MODEL/uranium_LAYER1.MXD 019040

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GIS/MXDS/CHEMISTRY/
LAYER_MODEL/ALPHA_BHC_LAYER1.MXD 019040