HGL
HydroGeoLogic, Inc
Exceeding Expectations
Kansas City Operations

April 21, 2010

Ms. Nancy Swyers, P.E.
Task Order Project Officer
U. S. Environmental Protection Agency Region 7
SPFD Division
901 North 5th Street
Kansas City, Kansas 66101

Re: January 2010 Quarterly Sample Results for the One Hour Martinizing Source Area
Air Sparging/Soil Vapor Extraction System
10th Street OU2 Superfund Site, Columbus, Nebraska
EPA Region 7 AES Contract No. EP-S7-05-05, Task Order No. 0002

Dear Ms. Swyers:

Please find attached the quarterly submittal for the air sparging/soil vapor extraction (AS/SVE) system at the One Hour Martinizing (OHM) source area at the 10th Street Operable Unit 2 (OU2) Superfund Site in Columbus, Nebraska. This report was prepared in fulfillment of the reporting requirements of Task Order 0002. This is an abbreviated report presenting the analytical results obtained from the quarterly sampling event in January 2010. These results include summary data tables, potentiometric surface maps, plume maps, and weekly site visit reports. The site visit frequency was changed to bi-weekly in 2010. The Annual AS/SVE System Performance Report will provide detailed information on volatile organic compound (VOC) concentrations in groundwater at this source area, remediation activities, and AS/SVE system performance information.

During this quarter only the clay vapor extraction system (CVE) was operated due to high water levels. On January 13, 2010 operations technician Herb Scott conducted a site visit and found that the high vacuum granular activated carbon (GAC) unit was blowing a fine carbon dust through the exhaust stack. Mr. Scott attempted repairs; however, on January 15, the high vacuum GAC unit was again emitting carbon dust. The system was down starting January 15 for the remainder of the month because of this issue. Attachment 1 includes the site visit reports and checklists for November and December 2009 and January 2010.

Groundwater sampling procedures were performed in accordance with the *Long-Term Response Action Sampling and Analysis Plan for the 10th Street Site, Columbus, Platte County, Nebraska* (SAP), dated October 20, 2005. Listed below are the deviations for the January 2010 sampling event:

- MW-44A/M, MW-46A/M, and SVE-8 were not sampled due to large amounts of standing water over and around the wells.

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- For all samples containing potassium permanganate ($KMnO_4$) as indicated by a pink or purplish tint to the water, two separate sets of alternative research samples were collected in addition to the regular sample. One sample was acidified with ascorbic acid in the field, one was acidified with ascorbic acid in the laboratory within 24 hours, and the regular sample was acidified with hydrochloric acid (HCl) in the field. U.S. Environmental Protection Agency (EPA) requested these additional samples to determine the best method for collecting VOC groundwater samples affected by $KMnO_4$. The purple color of samples containing KMnO4 causes matrix interference that requires various levels of dilution depending on the amount of color in the sample to be properly analyzed. EPA discovered that the ascorbic acid stops the oxidation reaction of $KMnO_4$ on contact and neutralizes the sample color, thus providing a real-time snapshot of the contaminant concentration in the sample.

$KMnO_4$ injections at the OHM source area have been conducted by EPA's Remedial Action (RA) contractor Lee & Ryan. The OHM source area has been treated with four rounds of $KMnO_4$ injections. The injection dates, volume of oxidant, depth of injection, and number of injections are summarized in Table 1. The last round of injections concluded in mid-October 2009. Injection locations are shown on Figure 1.

Table 2 provides the static water level measurements that were taken during the January 2010 sampling event, with potentiometric surface maps provided as Figures 2, 3, and 4. As shown on these figures, groundwater flow is to the east-southeast, with some localized areas of groundwater depressions presumed to be a residual effect from the $KMnO_4$ injections.

Quality control (QC) sample results are summarized on Tables 3 and 4. Table 3 shows a comparison of samples and associated field duplicate samples taken from the same location. Relative percent difference (RPD) was calculated between the sample and field duplicate results for each detected analyte. The RPD precision criterion in the SAP of RPD less than 20 was slightly exceeded for the samples collected from SVE-6 for trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), and vinyl chloride. However, no decision error is indicated (i.e. both the original and field duplicate result were either above or below the maximum contaminant level [MCL]), and no qualifiers were added. Table 4 shows SVE-2 sample results and the corresponding rinsate blank. The rinsate blank was nondetect for all VOC analytes.

Wells PCIX-1B, PCIX-2B, MW-45M, and MW-47M contained coloring/tinting of the groundwater due to permanganate injections. As discussed above, these samples with notable permanganate color were preserved in three different ways. Table 6 shows a comparison of results between the preservation methods. The results were highest for the samples acidified in the field with ascorbic acid in all but one instance. The samples preserved in the laboratory upon sample receipt exhibited lower concentrations, and several analytes were not detected in the typical HCl-preserved samples. The data indicate that field preservation using ascorbic acid is the preferred method for collection of VOC groundwater samples with $KMnO_4$ color interference.

Contaminant plume maps are provided as Figures 5 through 11. Plume maps were not prepared for TCE or cis-1,2-DCE at the 50-foot level. The only well reported to contain TCE above the MCL was MW-47M, where TCE was reported at 6.5 micrograms per liter (μg/L). None of the samples collected at the 50-foot depth interval contained cis-1,2-DCE above the MCL of 70 μg/L. Samples that did not exhibit traces of $KMnO_4$ as indicated by pink or purple coloring were collected with regular, field-acidified HCl vials. The four samples that exhibited coloring (MW-45M, MW-47M, PCIX-1B, and PCIX-2B) were collected using three different preservation methods. The results from the samples that were acidified in the field with ascorbic acid are shown in Table 5 and on the associated plume maps.

Groundwater results for tetrachloroethene (PCE), TCE, and cis-1,2-DCE are summarized on Table 5. In the January 2010 event, PCIX-2D and MW-45A showed a rebound in PCE, TCE, and cis-1,2-DCE from October 2009 concentrations, while PCIX-5C showed a rebound in cis-1,2-DCE concentration only. PCIX-2C was the only well that showed significantly lower concentrations, with notable decreases for PCE, TCE, and cis-1,2-DCE.

Vapor samples were not collected during the January 2010 quarterly event because the CVE system was shut down due to the dust emissions from the CVE GAC vessel. In March 2010, the CVE effluent air was re-plumbed to the SVE GAC vessel; influent and effluent samples will be collected from this vessel during the April 2010 quarterly sampling event. A sample was collected from the liquid GAC effluent and submitted for VOC analysis. Analytical results for this sample indicated that it was nondetect for all VOC analytes. The next groundwater sampling event at OHM will occur during the week of April 19, 2010.

Please call Laura Splichal at (816) 444-8270 if you have any questions regarding this submittal.

Sincerely,

Laura Splichal

Laura L. Splichal, CHMM
Task Order Manager
CDM Federal Programs Corporation

Robert C. Overfelt, P.G, CHMM
AES Program Manager
HydroGeoLogic, Inc.

cc: N. Harris - NDEQ
D. Nicoski - EPA
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S. Holmes - HGL
M. Schlebusch - CDM
R. Kaspzyk – CDM

Tables and Figures:

Attachments:

Tables

Table 1 Summary of Chemical Oxidant Work

Injection Event	Start	End	Number of Points	Volume per Point (mass $KMnO_4$)	Percent $KMnO_4$ Solution	Injection Depth (feet bgs)
OHM Injections						
OHM Injection – Round 1	Sep-07	Oct-07	50 points	2,200 (385)	2.09	65-50, 50-35, 35-15
OHM Injection – Round 2	May-08	Jul-08	72 points	2,200 (275)	1.5	65-40, 40-15
OHM Injection – Round 3	Sep-08	Oct-08	28 points	2,200 (275)	1.5	65-40, 40-15
OHM Injection – Round 4	Aug-09	Oct-09	66 points	2,200 (275)	1.5	65-40, 40-15

bgs = below ground surface

Table 2 OHM Static Water Level Measurements - January 2010

Location	Northing	Easting	TOC Elevation (ft amsl)	Measured Water Depth (ft btoc)	Water Table Elevation (ft amsl)
PCIX-1B	15,054,881.63	2,090,361.17	1,444.84	10.54	1,434.30
PCIX-1C	15,054,881.80	2,090,359.27	1,444.79	10.50	1,434.29
PCIX-1D	15,054,879.49	2,090,360.31	1,444.76	10.47	1,434.29
PCIX-2B	15,054,873.46	2,090,400.28	1,444.75	10.44	1,434.31
PCIX-2C	15,054,873.37	2,090,397.79	1,444.81	10.51	1,434.30
PCIX-2D	15,054,871.88	2,090,399.55	1,444.71	10.38	1,434.33
PCIX-5B	15,054,865.48	2,090,443.00	1,444.37	10.64	1,433.73
PCIX-5C	15,054,865.39	2,090,441.09	1,444.39	10.06	1,434.33
PCIX-5D	15,054,863.31	2,090,442.21	1,444.37	10.07	1,434.30
SVE-1	15,054,877.12	2,090,264.93	1,446.50	12.13	1,434.37
SVE-2	15,054,789.12	2,090,256.04	1,445.92	11.62	1,434.30
SVE-3	15,054,863.37	2,090,340.67	1,444.41	10.15	1,434.26
SVE-4	15,054,810.78	2,090,339.91	1,445.84	11.51	1,434.33
SVE-5	15,054,781.09	2,090,379.14	1,445.58	11.29	1,434.29
SVE-6	15,054,812.00	2,090,426.00	1,444.78	10.52	1,434.26
SVE-7	15,054,781.82	2,090,461.20	1,444.28	10.10	1,434.18
SVE-8	15,054,816.80	2,090,495.67	1,444.03	NM*	NA
SVE-9	15,054,781.10	2,090,515.76	1,444.47	10.27	1,434.20
MW-26A	15,054,755.14	2,090,473.64	1,443.71	10.19	1,433.52
MW-26B	15,054,755.14	2,090,473.64	1,443.62	10.08	1,433.54
MW-44A	15,054,815.75	2,090,469.12	1,444.47	10.39	1,434.08
MW-44M	15,054,818.17	2,090,468.37	1,444.62	10.38	1,434.24
MW-45A	15,054,827.70	2,090,397.64	1,445.50	11.20	1,434.30
MW-45M	15,054,828.75	2,090,399.73	1,445.39	11.14	1,434.25
MW-46A	15,054,815.09	2,090,340.91	1,445.73	NM*	NA
MW-46M	15,054,816.99	2,090,340.52	1,445.81	10.37	1,435.44
MW-47M	15,054,860.98	2,090,339.24	1,445.28	10.98	1,434.30

HORIZONTAL DATUM (US SURVEY FEET)= UTM NAD 83, ZONE 14

VERTICAL DATUM (US SURVEY FEET)= NAVD 88

Note: Water levels were measured on January 19, 2010

BTOC - below top of casing

amsl - above mean sea level

Top of casing elevation of MW-44A adjusted because casing was cut down 1 7/8 inches.

NM - not measured

NA - not available

* Unable to measure water level due to extreme weather.

Table 3 Analytical Results of Pump QC Samples – January 2010

Compound	PCIX-1C			PCIX-5B			PCIX-5D			SVE-6			MW-45M		
	Sample (µg/L)	Duplicate (µg/L)	RPD (%)	Sample (µg/L)	Duplicate (µg/L)	RPD (%)	Sample (µg/L)	Duplicate (µg/L)	RPD (%)	Sample (µg/L)	Duplicate (µg/L)	RPD (%)	Sample (µg/L)	Duplicate (µg/L)	RPD (%)
PCE	**24**	**24**	0.0	**15**	**15**	0.0	**570**	**570**	0.0	**54**	**57**	5.4	0.5 U	0.5 U	NC
TCE	**17**	**17**	0.0	1	0.95	5.1	22 U	20 U	NC	**12**	**9.4**	24.3	0.5 U	0.5 U	NC
cis-1,2-DCE	**16**	**17**	6.1	0.5 U	0.5 U	NC	**23**	**21**	9.1	**11**	**8.5**	25.6	0.5 UJ	0.5 UJ	NC
trans-1,2-DCE	**2.6**	**2.6**	0.0	0.5 U	0.5 U	NC	22 U	20 U	NC	0.5 U	0.5 U	NC	0.5 UJ	0.5 UJ	NC
Vinyl Chloride	**0.59**	**0.56**	5.2	0.5 U	0.5 U	NC	22 U	20 U	NC	**0.92**	**0.68**	30.0	0.5 UJ	0.5 UJ	NC

RPD precision criterion in the SAP of RPD < 20 was slightly exceeded, but no decision error is indicated and no qualifiers were added.

Results in **bold** text are detected concentrations

Results in **bold** and shaded text exceed the cleanup level specified in the ROD (Federal MCL)

NC – Not calculated because sample results were below detection limits.

RPD – Relative Percent Difference

U – Not detected above the stated reporting limit

µg/L - microgram per liter

Table 4 Analytical Results of Pump Rinsate Samples – January 2010

Compound	Rinsate Blanks	
	Sample (µg/L)	Rinsate[1] (µg/L)
PCE	0.5 U	0.5 U
TCE	**4.6**	0.5 U
cis-1,2-DCE	**17**	0.5 U
trans-1,2-DCE	**6.5**	0.5 U
Toluene	0.5 U	0.5 U
Vinyl Chloride	0.5 U	0.5 U

1 - Rinsate blank was collected after sampling and decontamination of the pump at SVE-2.

Results in **bold** text are detected concentrations

Results in **bold** and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

U – Not detected above the stated reporting limit

µg/L - microgram per liter

Table 5 OHM Groundwater Sample Results

Well	Approx. Depth (bgs)	Analyte Concentrations (μg/L)															
		PCE															
		2007				2008						2009					2010
		January	April	July	October	January	April	July [2,3]	August [2,3]	October		January		April [5]	July [5]	October [5]	January [5]
Shallow Wells										PDBs [4]	Pump	PDBs [4]	Pump				
PCIX-1D	18 feet	23,000	75,000 J	42,000	270	220 J	190	ND	138	99 J	76 J	190	370	6.3 J	28	1,300	6.6
PCIX-2D	18 feet	580	170	900	290	410	66	29.9	66.5	79 J	46 J	33	36	120 J	200	710	3800 J
PCIX-5D	17 feet	140	140	46	71	1,300 J	2,000	14.9	3.33	160 J	450 J	48	480	110	5.7	590	570
SVE-1	20 feet	30	21	28	83	69	53	11.42	13.6	17 J	34 J	14	48	54 J	49	60	57
SVE-2	20 feet	3.5	2.2	2	12	7.1	1.9	1	2.44	1.8	2.2	0.5 U	3	0.98 J	2.8	0.64 U	0.5 U
SVE-3	20 feet	180	150	100 L	520	1,100	750	8.31	51.3	19 J	23	13	2,600	1,300	1,100	74	40
SVE-4	20 feet	30	27 J	16 J	80	36	30	22.2	29.05 J	NS[1]	86	NS[1]	78	160 J	47	29	29
SVE-5	20 feet	58	73 J	27	250	52	49	5.27	52.9	43	40	120	100	780 J	590	NS	55
SVE-6	20 feet	510	1,000 J	410	10 U	40	10	10	30.5	130 J	290 J	180	180	280 J	22	120	54
SVE-7	20 feet	100	80	34	44	13	4.1	2.46	1.97	2 J	3 J	0.65	0.98	3.5 J	14 J	34	0.52
SVE-8	20 feet	19	NS	NS	180	NS	48	NS	NS	NS[1]	NS	NS[1]	NS	NS	NS	220	NS
SVE-9	20 feet	5.4	14	4.8	70	28	7.4	5.75	5.38	8.2 J	14 J	11	22	34 J	17 J	220	410
Intermediate Wells																	
PCIX-1C	30 feet	84	710 J	1,600	18	85	43	0.37	18.67	0.98 J	0.57 J	2.4	62	140 J	52	2.5 U	24
PCIX-2C	30 feet	490	400	240	100 U	1,400 J	83	151.3	458	96 J	120 J	130	280	750 J	12,000	300	150
PCIX-5C	30 feet	190	160	98	100	480	670	56.9	55.2	610	670	650	1,300	1,500	4,200	5 U	12
MW-44A*	30 feet	52	51 J	53	100 U	1,000 U	10 U	103.9	495	870 J	540 J	420	390	460	1,900	640	NS
MW-45A*	30 feet	910	4,300	2,700 J	13	100 U	5 U	122.9	222	34 J	25 J	170	260	320	250	220	1200
MW-46A*	30 feet	36	36	21 J	93	45	27	14.68	178	75	80	120	290	230	590 J	150	NS
PCIX-1B	50 feet	1,600	170 J	480	100 U	100 U	340	47.7	25.22	320 J	2,600 J	220	660	290	110	NS	50
PCIX-2B	50 feet	120	200	270	100 U	10 U	1,300	11.17	1,059 J	470 J	9,700 J	2.4	6,300	86	4,800 J	NS	40
PCIX-5B	50 feet	570	620	720	3,200	6,000 J	10,000	0.32	609 J	4.6	0.5 U	130	160	160	91	2.5 U	15
MW-44M*	50 feet	3,000	5,200	4,200	100 U	1,000 U	5 U	0.22	ND	5.4	0.5 U	3,100	3,500	700	17,000	5 U	NS
MW-45M*	50 feet	74	140 J	67 J	100 U	1,000 U	5 U	ND	14.4	1.2	0.5 U	6.8	7.5	13	7	NS	59
MW-46M*	50 feet	120	71	67 J	160	50	99	3.35	9.07	6.5 J	17 J	81	57	36	60	21	NS
MW-47M*	50 feet	130	110	98	100 U	1,000 U	1,000	2.94	219	17 J	15	22	21	19	70	NS	3.3

Results in **bold** text are detected concentrations

Results in bold and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

[1] - Could not sample with PDB bag due to misalignment of wellhead

[2] - July 2008 and August 2008 data was HAPSITE data, thus reporting limits were not available and samples not detected above the reporting limit were listed as non detect (ND).

[3] - August 2008 samples were collected using PDBs

[4] - PDB data is to be used for screening purposes only and was not used in trend graphs or on plume figures.

[5] - Rental bladder pump was used to sample well.

bgs - Below ground surface

NS - Not sampled

NI- Not installed

ND- Not detected

PDB - Passive Diffusion Bag

U - Not detected above the stated reporting limit

J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.

UJ - The analyte was not detected at or above the reporting limit. The reporting limit is an estimate.

PCE - tetrachloroethene

N/A R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.

TCE - trichloroethene

DCE - dichloroethene

μg/L - micrograms per liter

Table 5 OHM Groundwater Sample Results (continued)

		Analyte Concentrations (μg/L)															
	Approx.	TCE															
	Depth	2007				2008						2009					2010
Well	(bgs)	January	April	July	October	January	April	July ^{2,3}	August ^{2,3}	October		January		April ^{5}	July ^{5}	October ^{5}	January ^{5}
Shallow Wells										PDBs ^{4}	Pump	PDBs ^{4}	Pump				
PCIX-1D	18 feet	79	130	150	83	35	24	14.7	ND	2.5	0.5 U	21	13	0.5 UJ	17	52	5 U
PCIX-2D	18 feet	40	14	170	39	35	6	ND	ND	2.3 J	2.9 J	1.8	3.5	14 J	22 J	63	270
PCIX-5D	17 feet	51	60	20	15	32	23	ND	0.47	12 J	16 J	0.86	7.6	5 U	0.5 U	7.8	22
SVE-1	20 feet	8.6	7.1	5.6	21	27	13	1.92	1.2	4.1 J	6.4 J	1.9	7.7	10 J	3.8 J	5.2	4.7
SVE-2	20 feet	9	7.4	7.6	4.4	5	2.6	0.91	5.73	7.8 J	6.1 J	2.1	7	8.6 J	8.7	6	4.6
SVE-3	20 feet	79	59	57	75	180	120	7.89	13.2 J	2	0.5 U	3.1	190	200	50	45	35
SVE-4	20 feet	8.2	13 J	6.5	13	9.6	7.2	ND	6.01	NS[1]	20	NS[1]	12	19 J	16	12	13
SVE-5	20 feet	30	40	18	22	21	10	4.7	ND	5.8	6.2	4.9	7.4	90 J	72	NS	29
SVE-6	20 feet	58	110	47	10 U	6.4	1 U	1.25	ND	50	52	32	36	27 J	5.2	22	12
SVE-7	20 feet	23	24	16	4.5	2.1 J	1 U	0.52	0.45	0.59	0.5 U	0.5 U	0.5 U	0.73 J	4.4 J	9.1	0.5 U
SVE-8	20 feet	5.6	NS	NS	6.8	NS	9.9	NS	NS	NS[1]	NS	NS[1]	NS	NS	NS	32	NS
SVE-9	20 feet	1.5	4.6	1.6	10	8.8	3	1.73	1.69	4.2 J	6.3 J	2.8	5.2	4.9 J	1.7 J	7.9	12
Intermediate Wells																	
PCIX-1C	30 feet	18	40	27	10 U	70	16	3.44	17.27	17	0.5 U	6.3	12	19 J	25	2.5 U	17
PCIX-2C	30 feet	170	100	60	100 U	100	3.4	18.5	ND	2.7	0.5 U	3.6	5 U	25 J	750	120	42
PCIX-5C	30 feet	48	39	20	1 U	120	230	ND	50.7	220 J	160 J	240	330	450	1,700	5 U	27
MW-44A*	30 feet	32	52	63	100 U	1,000 U	10 U	13.9	50	75	87 J	100	170	330	950	290	NS
MW-45A*	30 feet	93	410	330	10 U	100 U	5 U	ND	ND	2.2	0.5 U	8.8	7.8	20 J	22	2.5 U	71
MW-46A*	30 feet	15	9	9.2	6.5 J	19	5.2	4.73	25	8.9	9.7	27	36	58	88	29	NS
PCIX-1B	50 feet	4	2.3	2.9	100 U	100 U	1 U	ND	ND	2	10 U	2.6	5.4	5 U	2.3	NS	1 U
PCIX-2B	50 feet	7.4	8	16	100 U	10 U	1 U	ND	50.7	26	100 UJ	7 J	32 U	6.4	63	NS	2.9
PCIX-5B	50 feet	18	17	22	83	45	63	ND	ND	0.5 U	0.5 U	14	15	6.1	14	2.5 U	1
MW-44M*	50 feet	40	73	110	100 U	1,000 U	5 U	ND	ND	0.5 U	0.5 U	12	7.4 U	11	1,100	5 U	NS
MW-45M*	50 feet	33 J	51	37	100 U	1,000 U	5 U	ND	1.4	0.5 U	0.5 U	0.5 U	N/A R	0.5 U	0.5 UJ	NS	3.2
MW-46M*	50 feet	20	23 J	20	40	14	9.4	ND	1.07	0.5 U	0.5 U	18	16	14	14	11	NS
MW-47M*	50 feet	95	61	100	100 U	1,000 U	1 U	ND	ND	5.2 J	0.5 U	22	25	24	28	NS	6.5

Results in bold and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

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Table 5 OHM Groundwater Sample Results (continued)

Well	Approx. Depth (bgs)	Analyte Concentrations (μg/L)															
		cis-1,2-DCE															
		2007				2008						2009					2010
		January	April	July	October	January	April	July [2,3]	August [2,3]	October		January		April [5]	July [5]	October [5]	January [5]
										PDBs [4]	Pump	PDBs [4]	Pump				
Shallow Wells																	
PCIX-1D	18 feet	64	140	280	300	54	37	254.9	ND	4.3 J	0.5 U	16	8.1	2.3 J	21 J	26	5 U
PCIX-2D	18 feet	140	30	360	81	57	16	ND	ND	6.5 J	8.5 J	5.7	17	30 J	45 J	39	310
PCIX-5D	17 feet	39	43	22	18	38	13	ND	ND	25	27	0.97	8.8	5 U	0.5 U	11	23
SVE-1	20 feet	1.5	1.5	1 U	1.2	1.5	2.6	0.51	0.67	0.8	0.95	0.5 U	0.9	1.2 J	0.72	1.2	0.66
SVE-2	20 feet	10	13	12	3.5	4.6	2.8	ND	6.98	10 J	7.9 J	4	9.5	18 J	14	15	17
SVE-3	20 feet	55	38	39	15	61	37	6.01	ND	1.1	0.5 U	1.2	45	98	21	56	50
SVE-4	20 feet	2.9	4	2	8.1	4.7	3.8	ND	2.6	NS[1]	8.9 J	NS[1]	6.1	8.5 J	8.9 J	5	5.1
SVE-5	20 feet	22	38	15	11	13	7.2	3.89	ND	3.8	5	3.5	5.7	28	38	NS	22
SVE-6	20 feet	90	99	58	10 U	5.9	2.6	1.5	151.3	35 J	18 J	46	52	9.4 J	2.8 J	19	11
SVE-7	20 feet	28	31	20	5.7	3.7 J	2.2	0.47	0.75	0.96	0.91 J	0.5 U	0.5 U	1 J	2	4.2	0.5 U
SVE-8	20 feet	13	NS	NS	1.8	NS	30	NS	NS	NS[1]	NS	NS[1]	NS	NS	NS	29	NS
SVE-9	20 feet	5.3	14	5	16	18	6.3	0.76	1.41	8.4 J	13 J	3.9	10	12 J	3.6	16	22
Intermediate Wells																	
PCIX-1C	30 feet	28	100	41	10 U	45	11	18.23	45.6 J	22	N/A R	47	4	13 J	19	2.5 U	16
PCIX-2C	30 feet	150	59	46	100 U	29	8.1	31.3	ND	1 U	N/A R	9	5 U	40 J	170	120	92
PCIX-5C	30 feet	61	38	25	1 U	46	170	ND	163	320 J	140 J	280	130	120	180 J	5 UJ	64
MW-44A*	30 feet	130	150	150	100 U	1,000 U	10 U	53.7	222	340	410 J	280	400	570 J	1,500	5 U	NS
MW-45A*	30 feet	61	190	140	10 U	100 U	5 U	16.8	ND	4.7	0.5 U	20	18	33	27 J	2.5 U	75
MW-46A*	30 feet	15	2.9	2.7	3.3 J	5.3	3.3	2.8	ND	39 J	3.2 J	12	15	21	45 J	14	NS
PCIX-1B	50 feet	3.3	1 U	1 U	100 U	100 U	1 U	ND	ND	1 U	10 U	1	1.7 U	5 U	0.5 U	NS	1 U
PCIX-2B	50 feet	12	3.6	1.2	100 U	10 U	1 U	0.9	56.2	36	100 U	39	32 U	13	52 J	NS	33
PCIX-5B	50 feet	1 U	1 U	1 U	50	11	9.7	ND	ND	0.5 UJ	N/A R	0.5 U	0.87	0.51	1.5 J	2.5 U	0.5 UJ
MW-44M*	50 feet	17	23	100	100 U	1,000 U	5 U	ND	ND	0.5 UJ	0.5 UJ	4.6	7.4 U	5 U	65	5 UJ	NS
MW-45M*	50 feet	1.3	2.5	1.8	100 U	1,000 U	5 U	ND	1.78	0.5 UJ	N/A R	0.5 U	0.5 U	0.5 U	N/A R	NS	2.7
MW-46M*	50 feet	1.5	1.3	2.1	2.1	1 U	1 U	ND	ND	0.5 UJ	0.5 U	8.2	3.3	3.2	7.3	3.2	NS
MW-47M*	50 feet	2	1.5	1.8	100 U	1,000 U	1 U	ND	ND	0.5 UJ	0.5 UJ	1.5	1.8	1.5 J	4.2	NS	1 U

Results in bold and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

Results in **bold** text are detected concentrations

[1] - Could not sample with PDB bag due to misalignment of wellhead

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[5] - Rental bladder pump was used to sample well.

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PDB - Passive Diffusion Bag
U - Not detected above the stated reporting limit
J - The associated numerical value is an estimated quantity because the reported concentrations were less than the required detection limits or quality control criteria were not met.
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PCE - tetrachloroethene
N/A R - The presence or absence of the analyte can not be determined from the data due to severe quality control problems. The data are rejected and considered unusable.
TCE - trichloroethene
DCE - dichloroethene
μg/L - micrograms per liter

Table 5 OHM Groundwater Sample Results (continued)

Well	Approx. Depth (bgs)	Analyte Concentrations (μg/L)															
		trans-1,2-DCE															
		2007				2008						2009					2010
		January	April	July	October	January	April	July ^{2,3}	August ^{2,3}	October		January		April ^{5}	July ^{5}	October ^{5}	January ^{5}
Shallow Wells										PDBs ^{4}	Pump	PDBs ^{4}	Pump				
PCIX-1D	18 feet	**4.5**	**12**	**6.8**	**4.7**	1 U	1 U	**214.5**	ND	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	**0.5 U**	10 U	5 U
PCIX-2D	18 feet	**2.1**	1 U	**9.6**	**1.7**	1 U	1 U	ND	ND	0.5 U	N/A R	0.5 U	0.5 U	0.5 UJ	**0.56 J**	2.5 U	15 U
PCIX-5D	17 feet	1 U	**1.2**	1 U	1 U	**1.1**	1 U	ND	ND	0.5 UJ	5 U	0.5 U	5 U	5 U	0.5 U	2.5 U	22 U
SVE-1	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	**0.28**	**0.62**	0.5 U	0.5 U	0.5 U	0.5 U	**0.61 J**	0.5 U	0.5 U	0.5 U
SVE-2	20 feet	**5.2**	**8.1**	**6.7**	**1.7**	**2.7**	**1.9**	ND	**4.22**	**5.8 J**	**3.8 J**	**1.9**	**3.3**	**5.2 J**	**2.5**	**4.9**	**6.5**
SVE-3	20 feet	**7.8**	**7.7**	**5.4**	**1.4**	**6.4**	**3.8**	**3.59**	ND	**0.64**	0.5 U	0.5 U	13 U	25 U	5 U	5 U	**6.1**
SVE-4	20 feet	**4**	**4.3 J**	**2.5**	1 U	1 U	1 U	ND	**0.59**	NS[1]	**2.7 J**	NS[1]	**1.4**	**1.2 J**	**2.8 J**	**2.7 J**	**2.9**
SVE-5	20 feet	**3**	**5.2**	**4.4**	1 U	1 U	1 U	**0.81**	ND	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	NS	**6.9**
SVE-6	20 feet	**1.6**	**2.1**	**1.1**	10 U	1 U	1 U	**1.02**	**146**	0.5 U	N/A R	0.5 U	0.5 U	2.5 UJ	0.5 U	0.5 U	0.5 U
SVE-7	20 feet	1 U	1 U	1 U	1 U	1 UJ	1 U	**0.25**	**0.69**	0.5 U	N/A R	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
SVE-8	20 feet	1 U	NS	NS	1 U	NS	1 U	NS	NS	NS[1]	NS	NS[1]	NS	NS	NS	2 U	NS
SVE-9	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	**0.44**	**1.31**	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	1 U	1.5 U
Intermediate Wells																	
PCIX-1C	30 feet	**4.8**	**4.9**	**1.3**	10 U	**4.8**	1 U	**0.29**	**0.93**	0.5 U	N/A R	**0.66**	0.5 U	0.5 UJ	0.5 U	2.5 U	**2.6**
PCIX-2C	30 feet	**4.5**	**2.5**	**1.3**	100 U	**2.4**	1 U	ND	ND	1 U	N/A R	0.5 U	5 U	5 UJ	5 U	5 U	5 U
PCIX-5C	30 feet	1 U	1 U	1 U	1 U	**1.2**	**3.2**	ND	**160**	**2 J**	**1.8**	**2.7**	5 U	50 U	5 U	5 UJ	**0.89**
MW-44A*	30 feet	**1.4**	**2.1**	**1.7 J**	100 U	1,000 U	10 U	**44.9**	**215**	10 U	13 UJ	**2.5**	**3.6**	**3.5 J**	**5.2**	5 U	NS
MW-45A*	30 feet	**2.6**	**6.2**	**3.9**	10 U	100 U	5 U	**14**	ND	0.5 U	0.5 U	0.5 U	0.7 U	5 U	0.5 U	2.5 U	4.6 U
MW-46A*	30 feet	**8.3**	**5.2**	**4.3**	1 U	**3**	1 U	**0.5**	ND	0.5 U	0.5 U	**1.7**	**2.1**	**14**	**14 J**	**8.2**	NS
PCIX-1B	50 feet	1 U	1 U	1 U	100 U	100 U	1 U	ND	ND	1 U	10 U	0.5 U	1.7 U	5 U	0.5 U	NS	1 U
PCIX-2B	50 feet	1 U	1 U	1 U	100 U	10 U	1 U	**0.56**	**56.2**	5 U	100 U	0.5 U	32 U	5 U	**1.2**	NS	1 U
PCIX-5B	50 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 UJ	N/A R	0.5 U	0.5 U	0.5 U	0.5 U	2.5 U	0.5 U
MW-44M*	50 feet	1 U	1 U	**2**	100 U	1,000 U	5 U	ND	ND	0.5 UJ	0.5 UJ	3.2 U	7.4 U	5 U	5 U	5 UJ	NS
MW-45M*	50 feet	1 U	1 U	1 U	100 U	1,000 U	5 U	ND	**1.65**	0.5 UJ	N/A R	0.5 U	0.5 U	0.5 U	N/A R	NS	1 U
MW-46M*	50 feet	1 U	1 U	1 U	**1**	1 U	1 U	ND	ND	0.5 UJ	0.5 U	**2.8**	**1.3**	**1.4**	**3.2**	**1.7**	NS
MW-47M*	50 feet	1 U	1 U	1 U	100 U	1,000 U	1 U	ND	ND	0.5 UJ	0.5 UJ	0.5 U	0.5 U	0.5 UJ	**0.76**	NS	1 U

Results in bold and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

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TCE - trichloroethene

DCE - dichloroethene

μg/L - micrograms per liter

Table 5 OHM Groundwater Sample Results (continued)

Well	Approx. Depth (bgs)	Analyte Concentrations (μg/L)															
		Vinyl Chloride															
		2007				2008						2009					2010
		January	April	July	October	January	April	July [2,3]	August [2,3]	October		January		April [5]	July [5]	October [5]	January [5]
Shallow Wells										PDBs [4]	Pump	PDBs [4]	Pump				
PCIX-1D	18 feet	1 U	**3**	**4.7**	1 U	**4.1**	1 U	ND	ND	**0.56**	N/A R	**2**	5 U	0.5 UJ	**3.4**	10 U	5 U
PCIX-2D	18 feet	1 U	1 U	**2.2**	**14**	**6**	1 U	ND	ND	**4.5 J**	**6.9 J**	0.5 U	**9.1**	**9.1 J**	**33**	**7.6**	**19**
PCIX-5D	17 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	5 U	0.5 U	5 U	5 U	0.5 U	2.5 U	22 U
SVE-1	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
SVE-2	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
SVE-3	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 UJ	0.5 U	13 U	25 U	5 U	5 U	0.5 U
SVE-4	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	NS[1]	0.5 U	NS[1]	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
SVE-5	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	5 U	5 U	NS	0.5 U
SVE-6	20 feet	1 U	1 U	1 U	10 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	2.5 UJ	0.5 U	**3**	**0.92**
SVE-7	20 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U
SVE-8	20 feet	1 U	NS	NS	1 U	NS	1 U	ND	ND	NS[1]	NS	NS[1]	NS	NS	NS	2 U	NS
SVE-9	20 feet	1 U	1 U	**4**	1 U	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.5 U	0.5 UJ	2 U	1 U	1.5 U
Intermediate Wells																	
PCIX-1C	30 feet	**26**	**73**	**29**	10 U	**2.2**	**9.6**	**20.6**	ND	**17**	N/A R	**32**	**3.1**	**5.4 J**	**17**	2.5 U	**0.59**
PCIX-2C	30 feet	**11**	**4.8**	**4**	100 U	**7**	**1.2**	ND	ND	1 U	N/A R	0.5 U	5 U	5 UJ	**49**	**6.4**	**9.9**
PCIX-5C	30 feet	1 U	1 U	1 U	1 U	1 U	**9.7**	ND	ND	**35 J**	**18 J**	**7**	5 U	50 U	5 U	5 UJ	0.5 U
MW-44A*	30 feet	1 U	1 U	1 U	100 U	1,000 U	10 U	ND	ND	10 U	13 UJ	2 U	**2.2**	**3.1**	**6.7**	5 U	NS
MW-45A*	30 feet	1 U	**6.2**	**6.7**	10 U	100 U	5 U	ND	ND	0.5 U	0.5 U	**0.63**	0.7 U	5 U	**0.7**	2.5 U	4.6 U
MW-46A*	30 feet	1 U	1 U	1 U	1 UJ	1 U	1 U	ND	ND	0.5 U	0.5 U	0.5 U	0.75 U	2.5 U	0.5 U	1 U	NS
PCIX-1B	50 feet	1 U	1 U	1 U	100 U	100 U	1 U	ND	ND	1 U	10 U	0.5 U	1.7 U	5 U	0.5 U	NS	1 U
PCIX-2B	50 feet	1 U	1 U	1 U	100 U	10 U	1 U	ND	ND	**13**	100 U	**17**	32 U	5 U	**6.4**	NS	**2.5**
PCIX-5B	50 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	N/A R	0.5 U	0.5 U	0.5 U	0.5 U	2.5 U	0.5 U
MW-44M*	50 feet	1 U	1 U	1 U	100 U	1,000 U	5 U	ND	ND	0.5 U	N/A R	3.2 U	7.4 U	5 U	5 U	5 UJ	NS
MW-45M*	50 feet	1 U	1 U	1 U	100 U	1,000 U	5 U	ND	ND	0.5 U	N/A R	0.5 U	N/A R	0.5 UJ	N/A R	NS	1 U
MW-46M*	50 feet	1 U	1 U	1 U	1 U	1 U	1 U	ND	ND	0.5 U	0.5 UJ	0.5 U	0.5 U	0.5 U	0.5 UJ	0.5 U	NS
MW-47M*	50 feet	1 U	1 U	1 U	100 U	1,000 U	1 U	ND	ND	0.5 UJ	N/A R	0.5 U	0.5 U	0.5 U	0.5 U	NS	1 U

Results in bold and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

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TCE - trichloroethene
DCE - dichloroethene
μg/L - micrograms per liter

Table 6 January 2010 OHM Source Area Research Samples

Well ID	Analyte	Asorbic Acid in Field		Ascorbic Acid in Lab		HCl in Field		Units
MW-45M	PCE	**59**		**22**		0.5	U	µg/L
MW-45M	TCE	**3.2**		1	U	0.5	U	µg/L
MW-45M	cis-1,2-DCE	**2.7**		1	U	0.5	U	µg/L
MW-45M	trans-1,2-DCE	1	U	1	U	0.5	U	µg/L
MW-45M	Vinyl Chloride	1	U	1	U	0.5	U	µg/L
MW-45M FD	PCE	**56**		**21**		0.5	U	µg/L
MW-45M FD	TCE	**3.1**		1	U	0.5	U	µg/L
MW-45M FD	cis-1,2-DCE	**2.6**		1	U	0.5	U	µg/L
MW-45M FD	trans-1,2-DCE	1	U	1	U	0.5	U	µg/L
MW-45M FD	Vinyl Chloride	1	U	1	U	0.5	U	µg/L
MW-47M	PCE	**3.3**		**2.8**		**2.3**		µg/L
MW-47M	TCE	**6.5**		**2.1**		0.5	U	µg/L
MW-47M	cis-1,2-DCE	1	U	1	U	0.5	U	µg/L
MW-47M	trans-1,2-DCE	1	U	1	U	0.5	U	µg/L
MW-47M	Vinyl Chloride	1	U	1	U	0.5	U	µg/L
PCIX-1B	PCE	**50**		**33**		**1**		µg/L
PCIX-1B	TCE	1	U	1	U	0.5	U	µg/L
PCIX-1B	cis-1,2-DCE	1	U	1	U	0.5	U	µg/L
PCIX-1B	trans-1,2-DCE	1	U	1	U	0.5	U	µg/L
PCIX-1B	Vinyl Chloride	1	U	1	U	0.5	U	µg/L
PCIX-2B	PCE	**40**		**43**		**35**		µg/L
PCIX-2B	TCE	**2.9**		1	U	0.5	U	µg/L
PCIX-2B	cis-1,2-DCE	**33**		**1.6**		0.5	U	µg/L
PCIX-2B	trans-1,2-DCE	1	U	1	U	0.5	U	µg/L
PCIX-2B	Vinyl Chloride	**2.5**		1	U	0.5	U	µg/L

Results in **bold** text are detected concentrations

Results in **bold** and shaded text exceed the cleanup level specified in the ROD (Federal MCL).

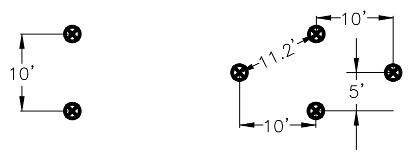
Figures

OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 1
OHM Source Area $KMnO_4$ Injection Locations - Round 4

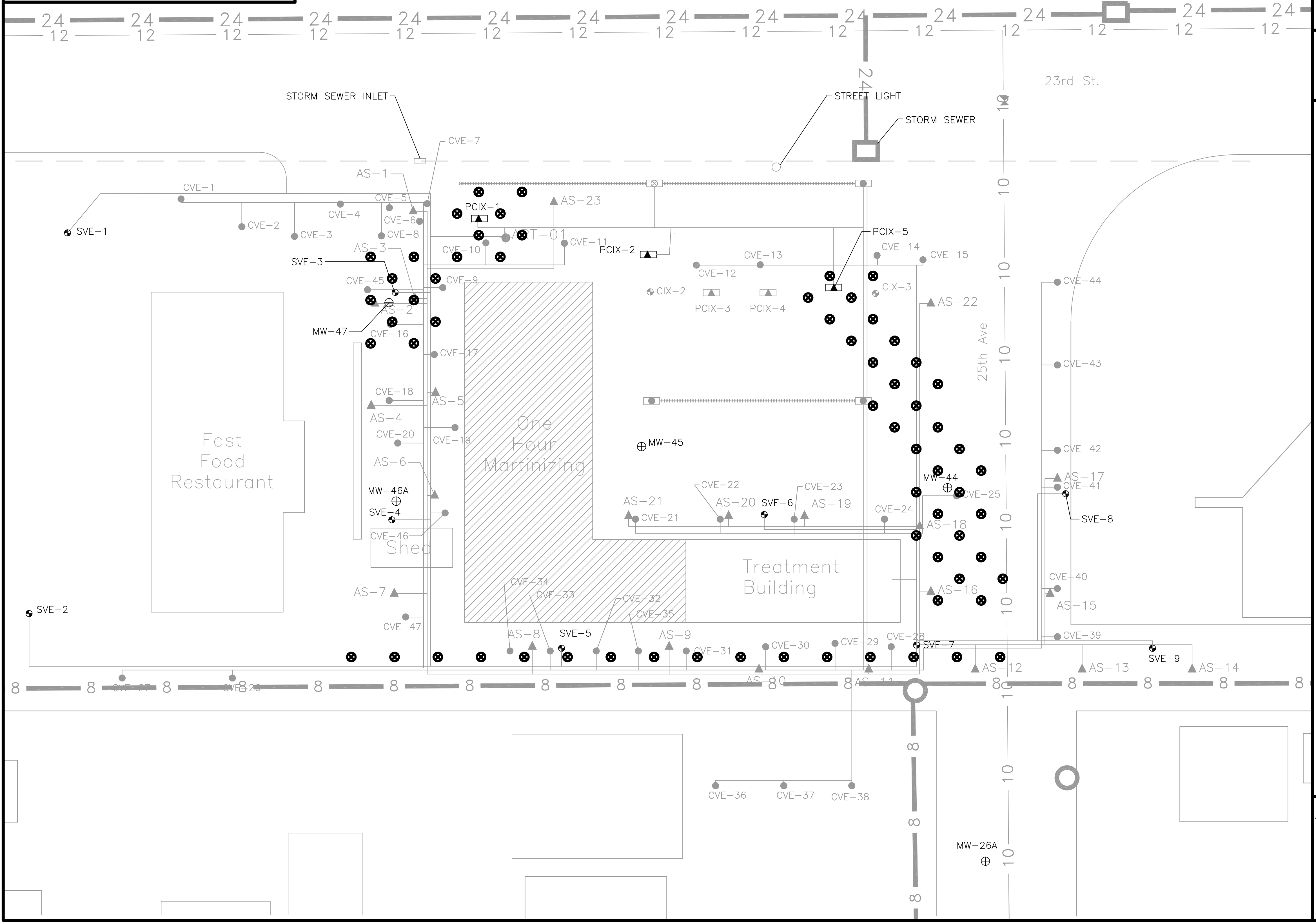
U.S. EPA
Region 7

Dimensions for Injection Points



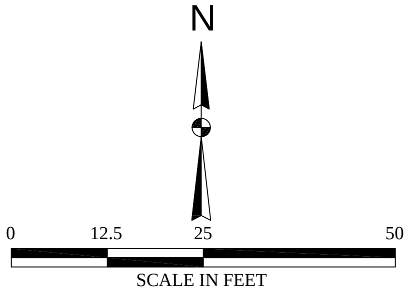
Injection Round	Number of Injection Points	Approximate Injection Depth (feet bgs)	Maximum Injection Point Spacing (ft)	Percent Solution	Gallons Per Injection Point	Pounds $KMnO_4$ Per Injection Point	Total Pounds of $KMnO_4$
Round 4	66	10 to 60	10	1.5	2,200	275	18,150

bgs = Below Ground Surface



Legend

⊕	Monitoring Well (MW) (~20' Deep)
⊗	$KMnO_4$ Injection Location
◍	Sand Vapor Extraction (SVE) well (~20' Deep)
●	Clay Vapor Extraction (CVE) well (~6' Deep)
▲	Air Sparge (AS) well (~70' Deep)
▲	Pilot Combined Injection and Extraction (PCIX) well
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well
—— 10 ——	Existing 10" Water Line
—— 12 ——	Existing 12" Water Line
━━ 8 ━━	Existing 8" Sanitary Sewer Line
━━ 24 ━━	Existing 24" Stormwater Line



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Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc

CDM

Y:\CAD\Tenth\AS-SVE\plume 2010-01\OHM-Inj_Rd4.dwg 04-09-10 14:13

OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

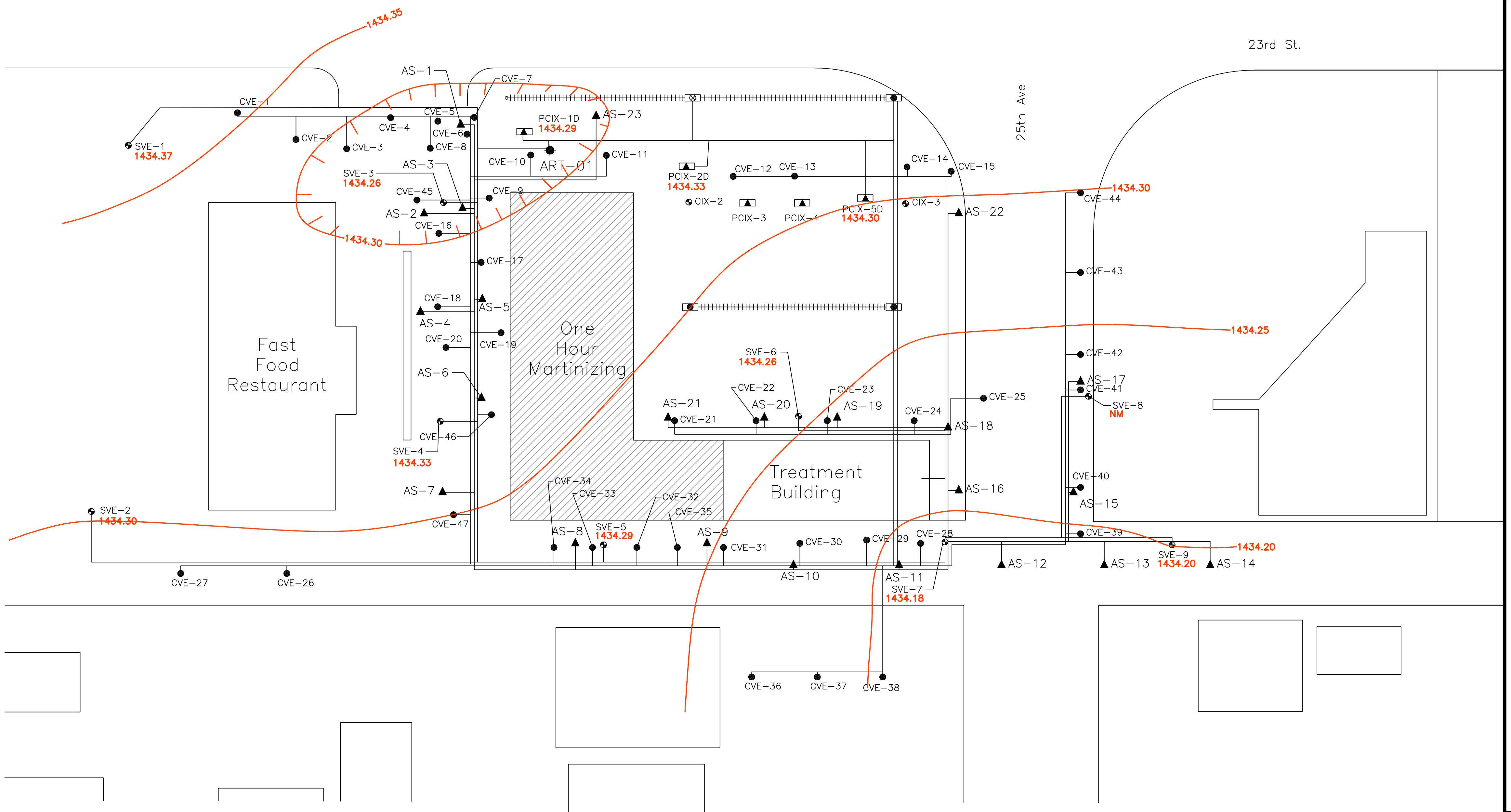
Figure 2
Potentiometric Surface
(17 to 20 Feet)
January 2010

U.S. EPA
Region 7

Legend

—	Contour
⊕	Monitoring Well (MW) well
⊗	Sand Vapor Extraction (SVE) well (~20' Deep)
●	Clay Vapor Extraction (CVE) well (~6' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
1435.25	Groundwater level at shallow wells (feet amsl)
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

Note:
All water levels were measured on January 19, 2010.
Contour Interval is 0.05 feet.



N

0 15 30 60
SCALE IN FEET

Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\GW-20feet.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc

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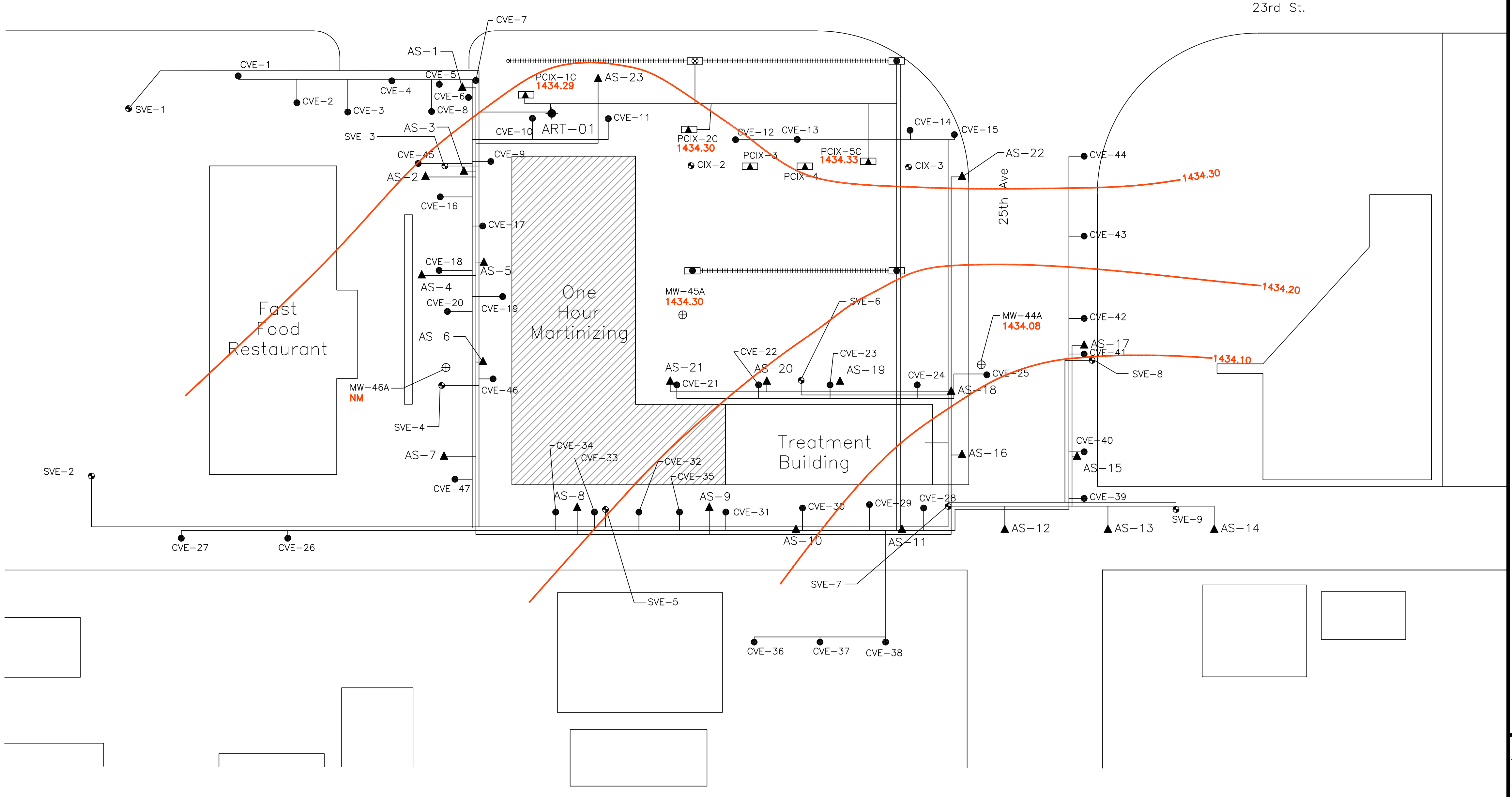
OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 3
Potentiometric Surface
(30 Feet)
January 2010

U.S. EPA
Region 7



Legend

—	Contour
⊕	Monitoring Well (MW) well
⊘	Sand Vapor Extraction (SVE) well (~20' Deep)
●	Clay Vapor Extraction (CVE) well (~6' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊡	Pilot Combined Injection and Extraction (PCIX) well
1435.15	Groundwater Level at intermediate wells (feet amsl)
✦	Accelerated Remediation Technologies (ART) Integrated Remediation System well

Note: All water levels were measured on January 19, 2010.
Contour Interval is 0.1 feet.

N

0 15 30 60
SCALE IN FEET

Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01|GW-30feet.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc CDM

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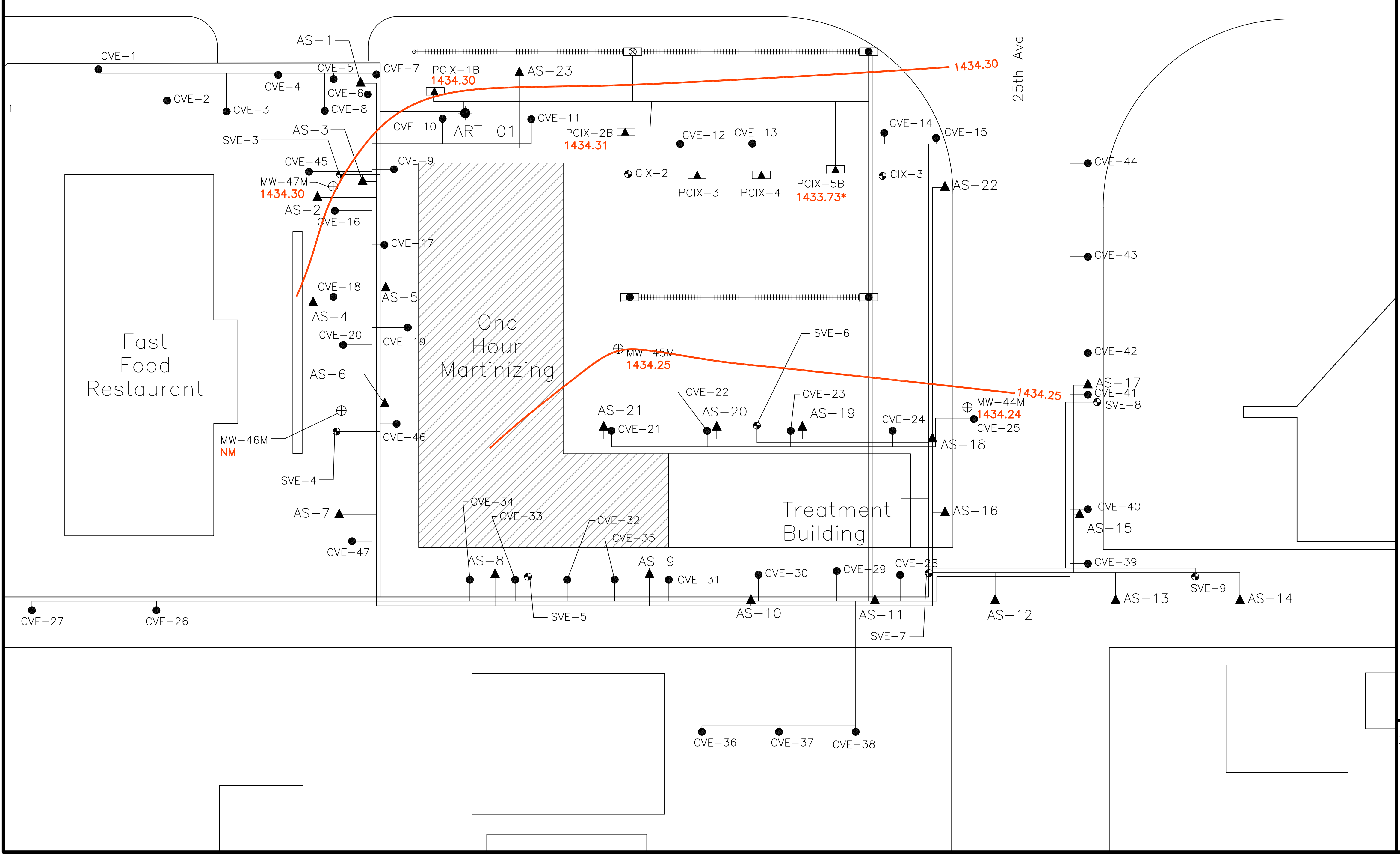


Y:\CAD\Tenth\AS−SVE\plume 2010−01\GW−50feet.dwg 04−09−10 14:22

OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 4
Potentiometric Surface
(50 Feet)
January 2010

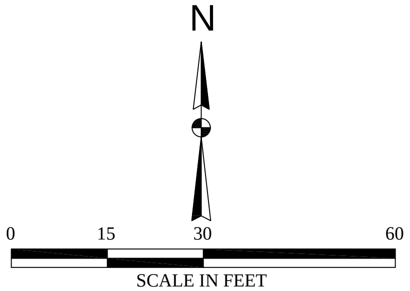
U.S. EPA
Region 7

Legend

—	Contour
⊕	Monitoring Well (MW) well
◐	Sand Vapor Extraction (SVE) well (~20' Deep)
●	Clay Vapor Extraction (CVE) well (~6' Deep)
▲	Air Sparge (AS) well (~70' Deep)
▣	Pilot Combined Injection and Extraction (PCIX) well
1435.15	Groundwater Level at intermediate wells (feet amsl)
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

Note: All water levels were measured on January 19, 2010.
Contour Interval is 0.05 feet.

* Data point not used due to suspected measurement error.



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Task Order Number: 3370-002
Revised: 4/09/10 KBR

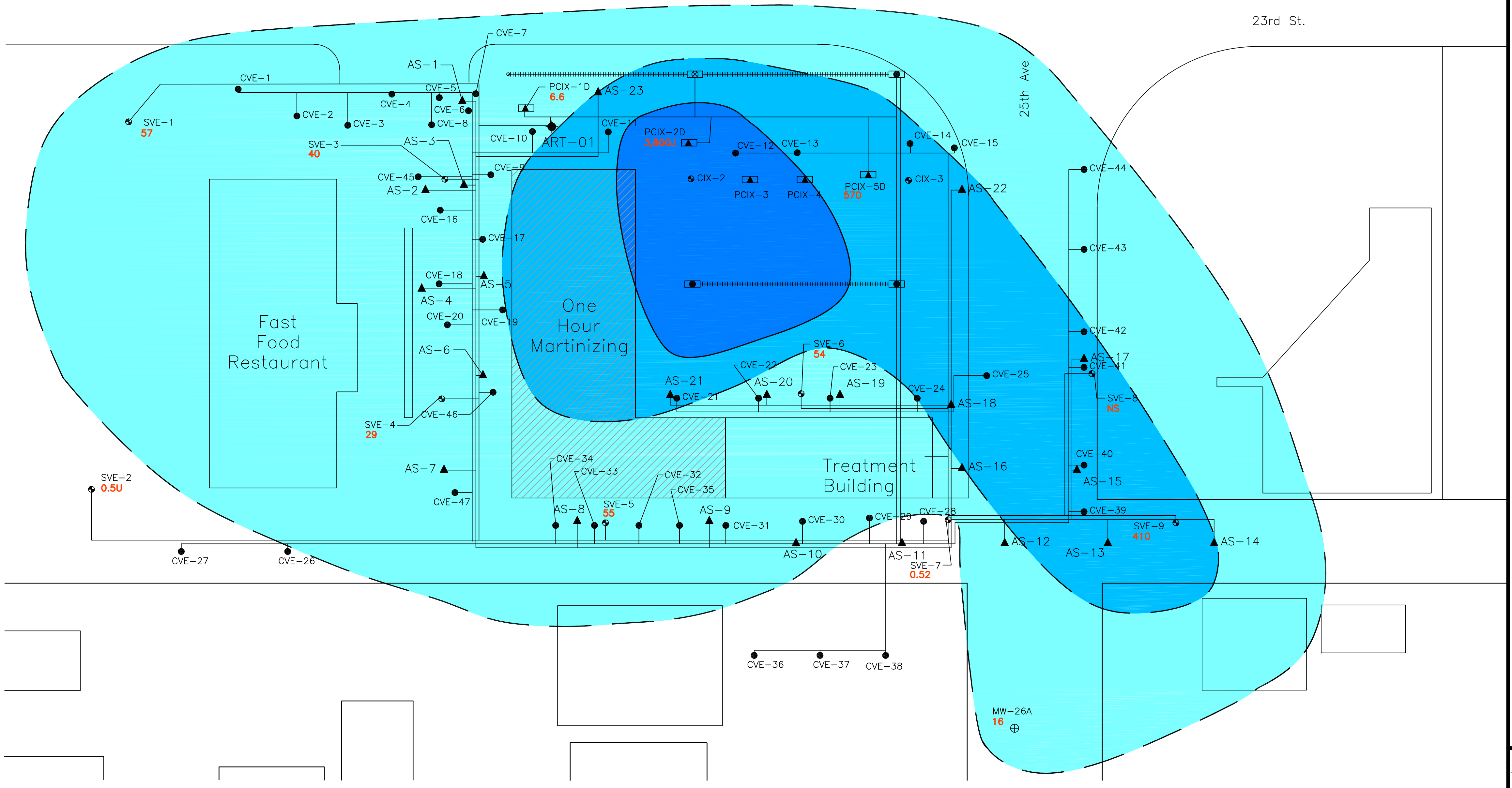
HGL HydroGeoLogic, Inc

CDM

OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 5
PCE Groundwater Sample Results (17 to 20 Feet) January 2010

U.S. EPA
Region 7

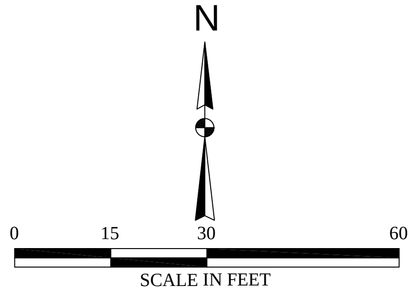


Legend

■	PCE (tetrachloroethene) > 5 µg/L
■	PCE > 100 µg/L
■	PCE > 1,000 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊗	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~20' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
NS	Not sampled
J	Estimated
U	Undetected above the stated reporting limit
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)

NS = Not sampled due to standing water



Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\20ft-PCE.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc

CDM

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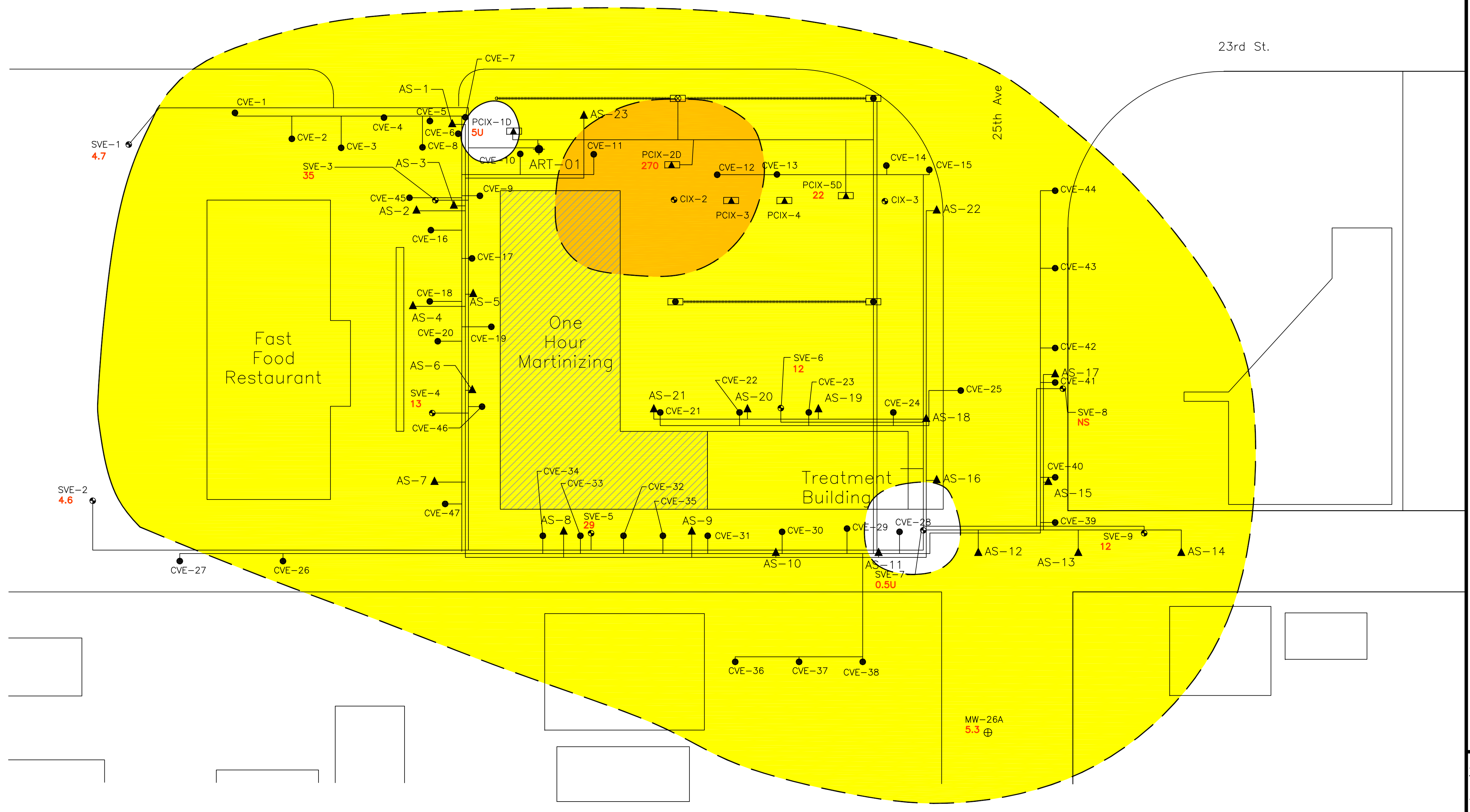
OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 6
TCE Groundwater Sample Results (17 to 20 Feet) January 2010

U.S. EPA
Region 7



Legend

🟨	TCE (trichloroethene) > 5 µg/L
🟧	TCE > 100 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊘	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~20' Deep)
▲	Air Sparge (AS) well (~70' Deep)
▣	Pilot Combined Injection and Extraction (PCIX) well
NS	Not sampled
U	Undetected above the stated reporting limit
J	Estimated
✦	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)

NS = Not sampled due to standing water

N

0 15 30 60
SCALE IN FEET

Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\20ft-TCE.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

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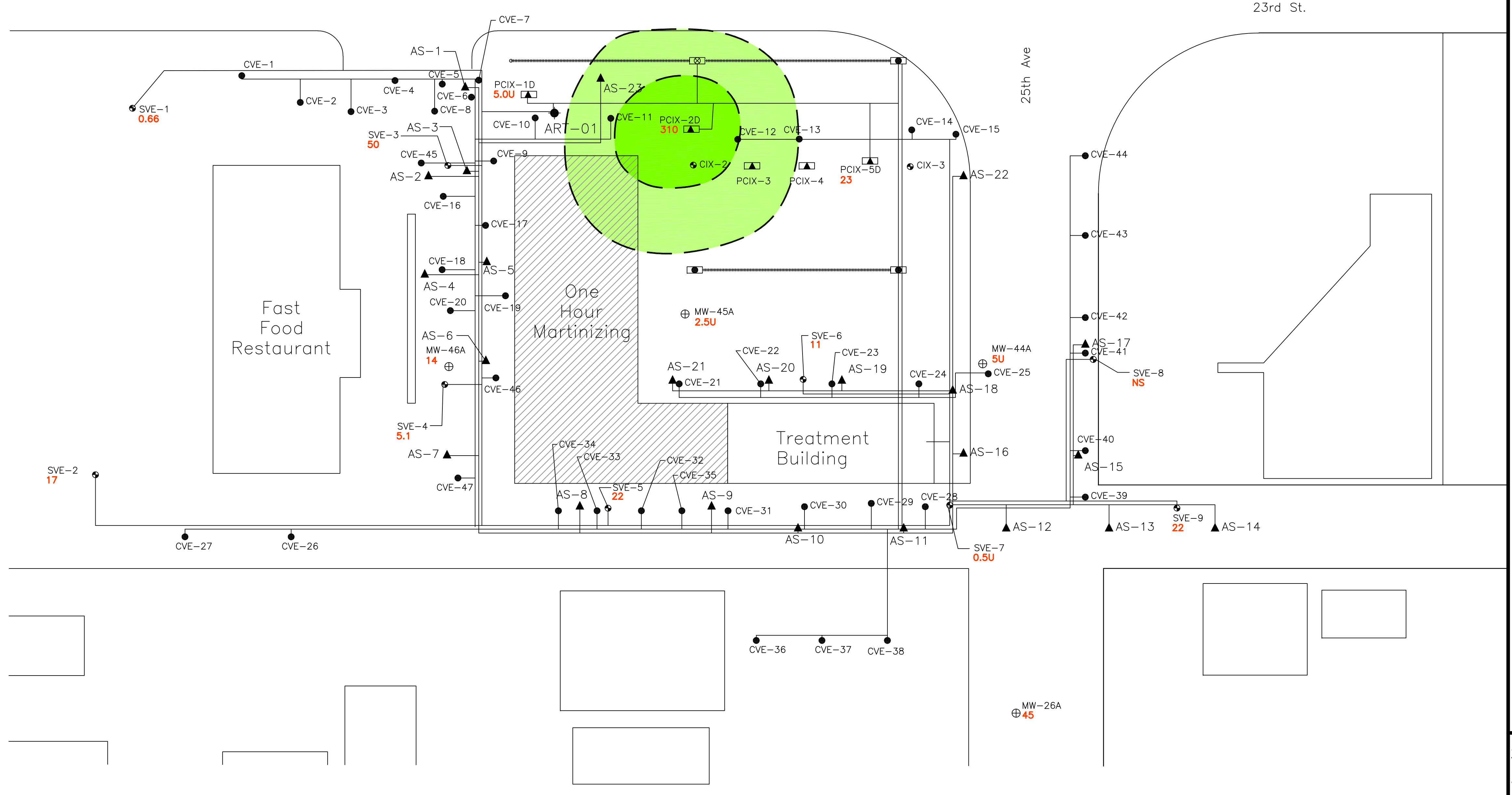
OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 7
cis-1,2-DCE Groundwater Sample Results (17 to 20 Feet) January 2010

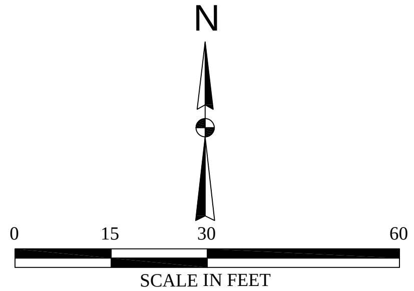
U.S. EPA
Region 7



Legend

🟩	cis (cis-1,2 dichloroethene) 70 - 100 µg/L
🟩	cis > 100 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊗	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~30' Deep)
▲	Air Sparge (AS) well (~70' Deep)
▲	Pilot Combined Injection and Extraction (PCIX) well
J	Estimated
NS	Not sampled
U	Undetected above the stated reporting limit
●	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)



Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\20ft-cis.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc

CDM

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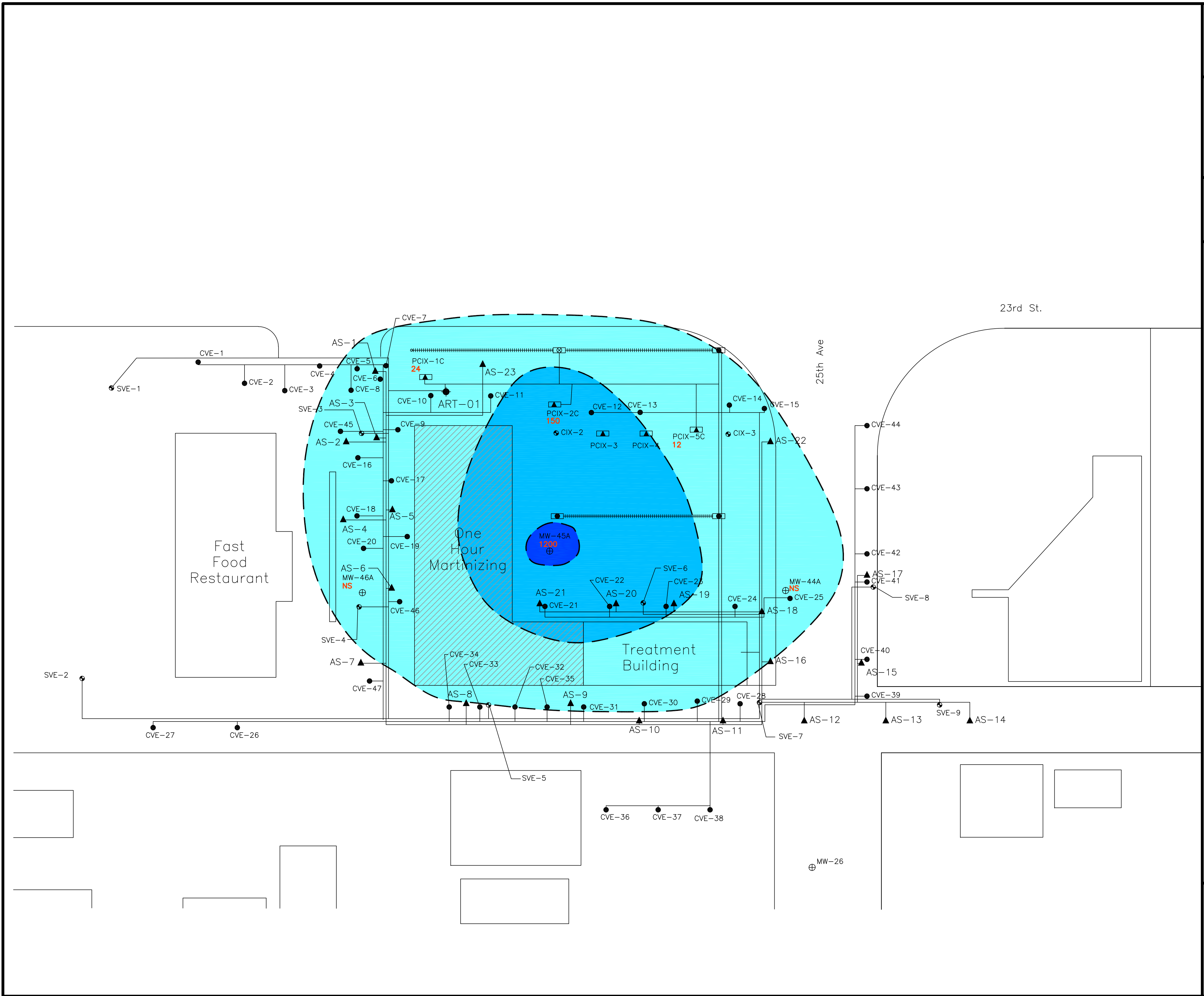

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OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

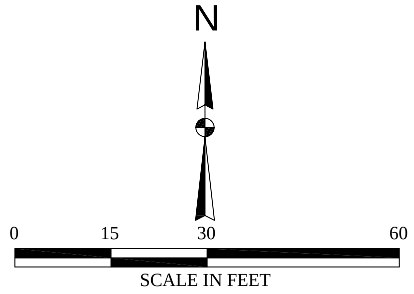
Figure 8
PCE Groundwater Sample Results (30 Feet) January 2010

U.S. EPA
Region 7

Legend

▨	PCE (tetrachloroethene) > 5 µg/L
▨	PCE > 100 µg/L
▨	PCE > 1,000 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊗	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~30' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
J	Estimated
NS	Not sampled
U	Undetected above the stated reporting limit
✦	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)



Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\30ft-PCE.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc
CDM

OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

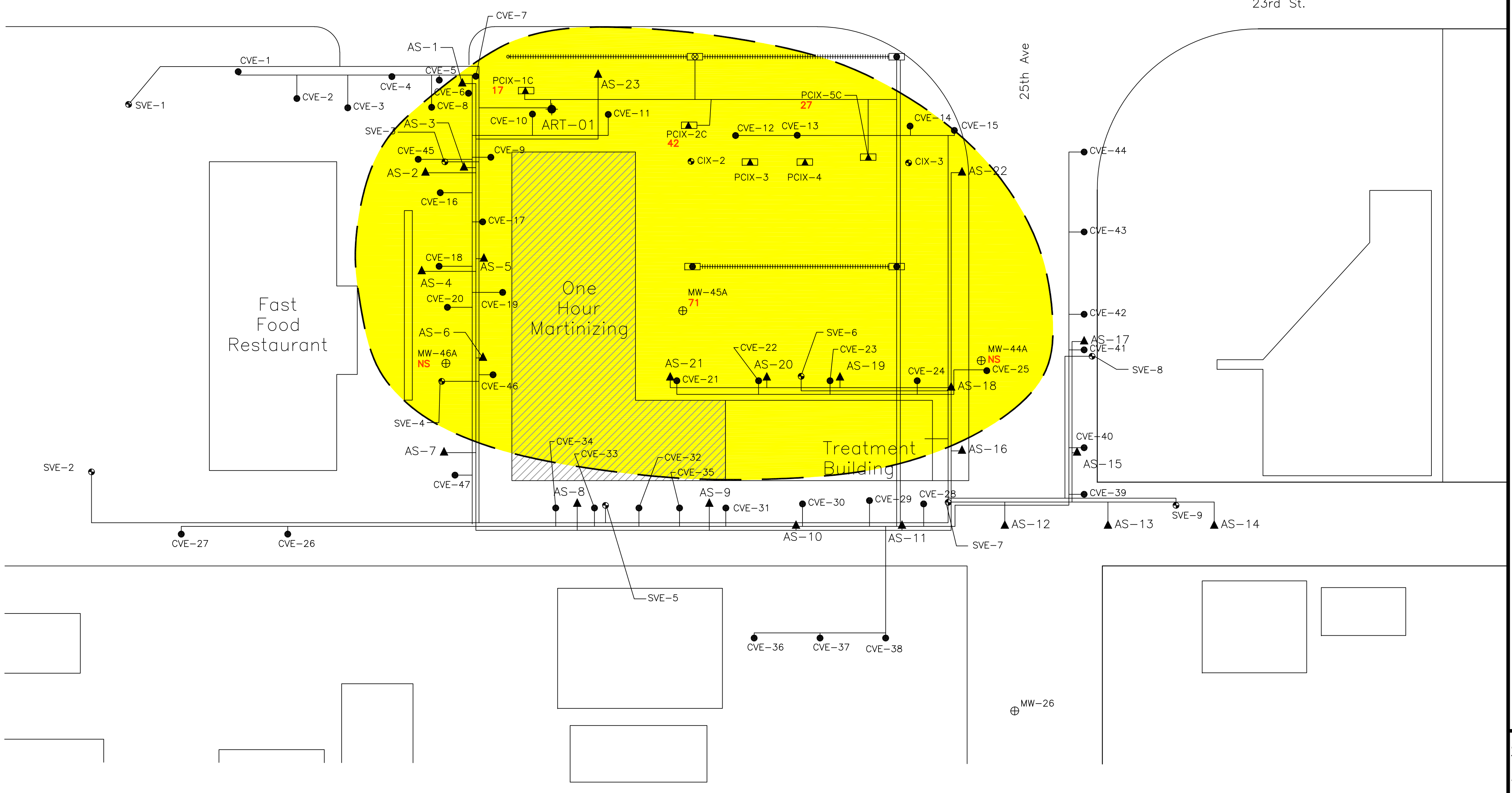
Figure 9
TCE Groundwater Sample Results (30 Feet) October 2009

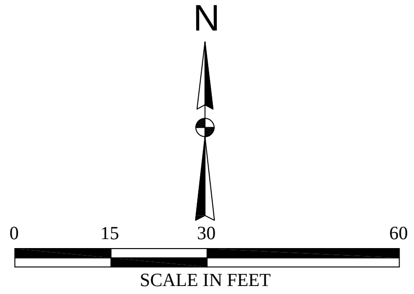
U.S. EPA
Region 7

Legend

🟨	TCE (trichloroethene) > 5 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊘	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~30' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
J	Estimated
NS	Not Sampled
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)





Filename: Y:\CAD\Tenth\AS-SVE\plume2010-01\30ft-TCE.dwg
Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc
CDM

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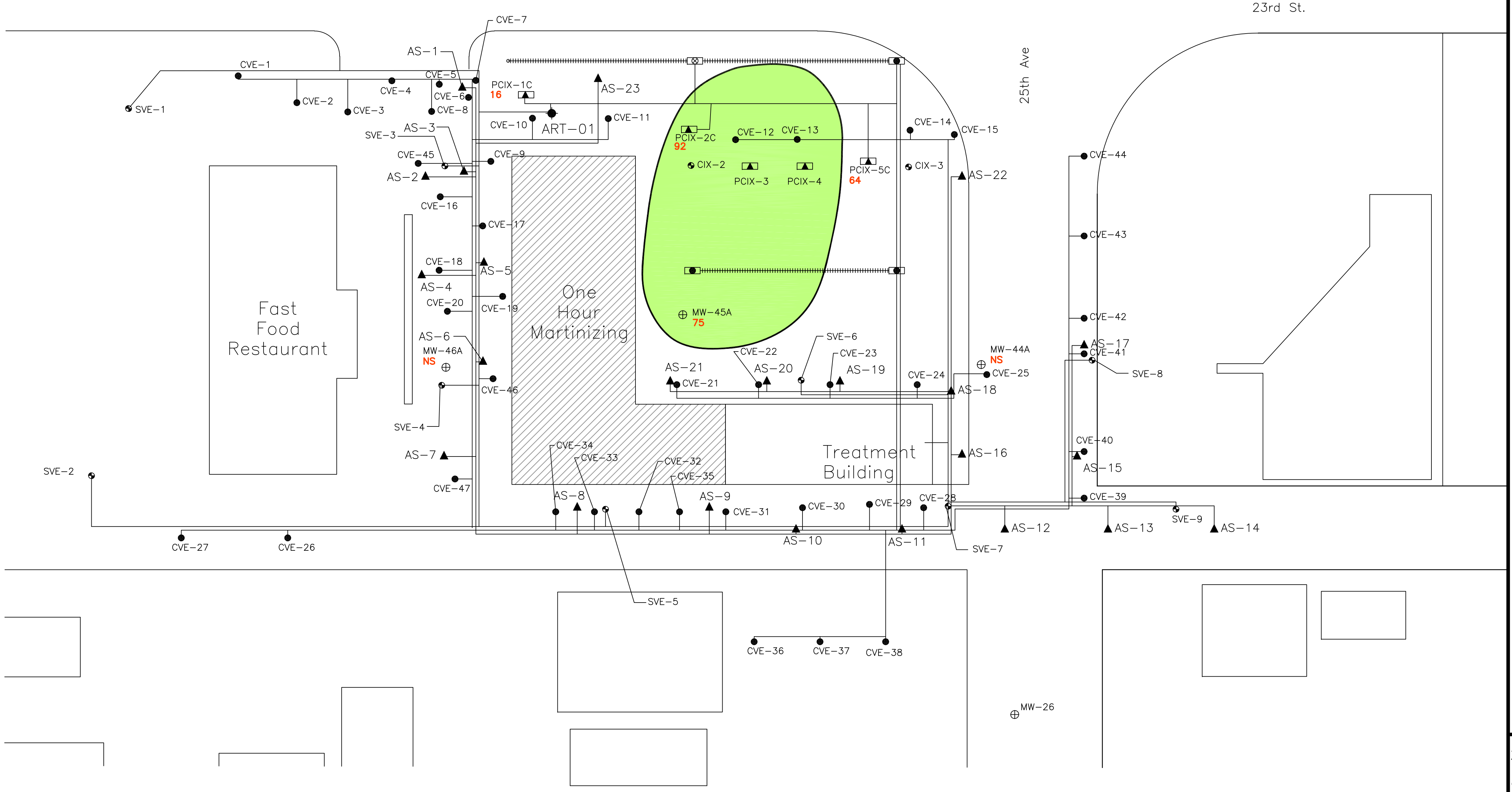
OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 10
cis-1,2-DCE Groundwater Sample Results (30 Feet) October 2009

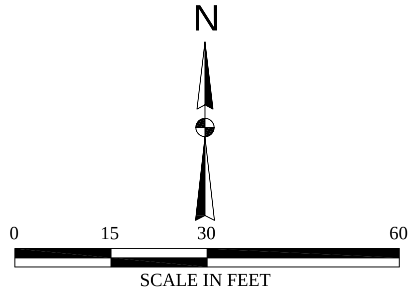
U.S. EPA
Region 7



Legend

🟩	cis (cis-1,2 dichloroethene) >70 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
⊗	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~30' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
J	Estimated
NS	Not Sampled
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)



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Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc
CDM

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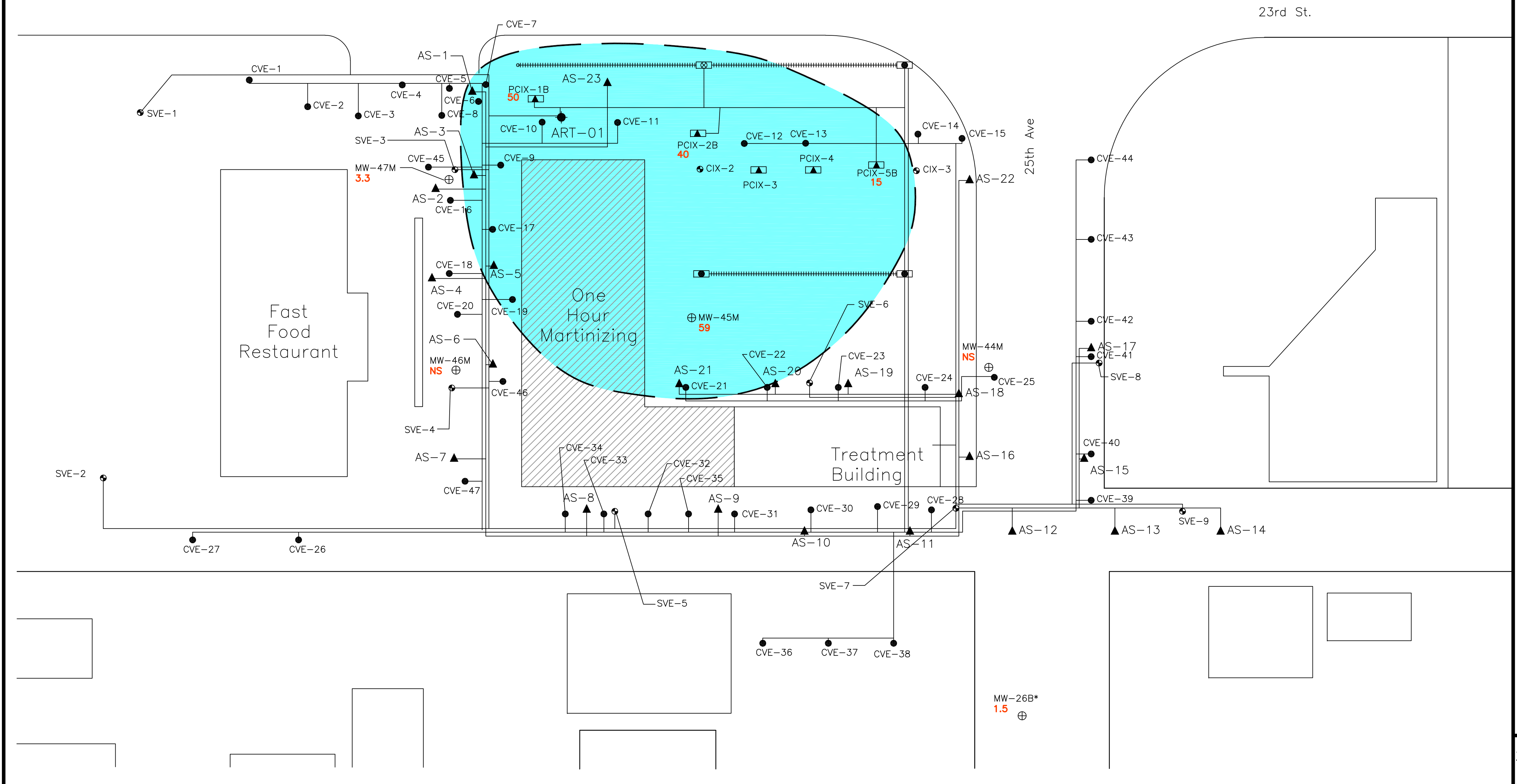
OHM Source Area
10th Street OU2 Site, Columbus, Nebraska

Figure 11
PCE Groundwater Sample Results
(50 Feet) January 2010

U.S. EPA
Region 7

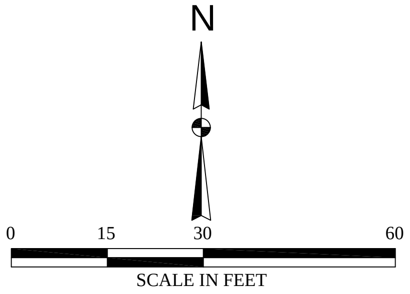


Legend

🟦	PCE (tetrachloroethene) > 5 µg/L
●	Clay Vapor Extraction (CVE) well (~6' Deep)
◉	Sand Vapor Extraction (SVE) well (~20' Deep)
⊕	Monitoring Well (MW) (~50' Deep)
▲	Air Sparge (AS) well (~70' Deep)
⊠	Pilot Combined Injection and Extraction (PCIX) well
U	Undetected above the stated reporting limit
J	Estimated
NS	Not Sampled
◆	Accelerated Remediation Technologies (ART) Integrated Remediation System well

All units in micrograms per liter (µg/L)

*Note: This well is screened 89-99 feet below ground surface (bgs)



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Task Order Number: 3370-002
Revised: 4/09/10 KBR

HGL HydroGeoLogic, Inc
CDM

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Attachment 1

AS/SVE Weekly System Checklists

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Stephen Holmes, HGL
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, August 5 to November 6, 2009.
Date: December 6, 2009

Introduction

On November 6, Stephen Holmes of HydroGeoLogic Inc., (HGL) re started the system and conducted a weekly site visit. The air sparging/soil vapor extraction system is located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska. The system has been down since August 17th until November6 2009 for the following reasons:

1. Groundwater recirculation pilot test during the week of August 10, 2009
2. ISCO injections August, September and October 2009
3. October Quarterly Monitoring event.
4. Excessive oil consumption in air compressor #1 and an unusual cycling in the #2 air compressor.

At the time of the system restart the only component of the system configured for continuous unsupervised operation is the high vacuum CVE system. The air sparging system is being run on supervised basis only so personnel can be on site to monitor for groundwater upwelling. The attached check list details what air sparge wells are valved on during sparging activities. The ART well was taken off line during the groundwater recirculation pilot study in August. Finally the low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Off	Automatic*
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Automatic
High Vacuum System Blower	Off	Automatic
High Vacuum System Heat Exchanger	Off	Automatic
High Vacuum Water Transfer Pump	Off	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Open	Open
Building Thermostat	58°F	50°F

* Compressor shut off at compressor control panel and the air line to sparge galleries was valved off in the building.

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The air sparging operation conditions were documented during a 10 minute period of supervised sparging
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.
- The high vacuum lines were dewatered.

Non-routine Maintenance

On September 25, 2009 the following non-routine maintenance items were conducted by an Omaha Pneumatic air compressor technician:

- Air Compressor #1
  - Check and clean high and low site oil scavenge line check valves.
  - Check and clean minimum pressure check valve.
  - Add 4 quarts oil
  - Clean air cooler and radiator
  - Identify oil leak at the oil filter sight glass. Ordered part for replacement.
  - Adjusted drive belts.
- Air Compressor #2
  - By pass auto float control on air filter by passed until a replacement auto float could be ordered and installed
  - Cleaned air cooler and radiator.
  - Adjusted drive belts.
- Turned system's heater on and closed air compressor air gates turned off exhaust fans.

On October 8, 9, and 12 the following non-routine maintenance items were conducted by HGL employee Herb Scott:

- The high vacuum exhaust line was re-plumbed through the north GAC vessel
- An air diversion door was cut into the heat exchanger duct work to allow warm air to be diverted into the system building during winter months.
- Water meters installed during the groundwater recirculation water pilot study were removed from PCIX 2 and SVE-3.
- Valved on air sparge wells at well heads as detailed in the attached system check sheet.
- Conducted supervised air sparging activities for approximately one hour.

On November 6th the following non-routine maintenance items were conducted by HGL employee Stephen Holmes:

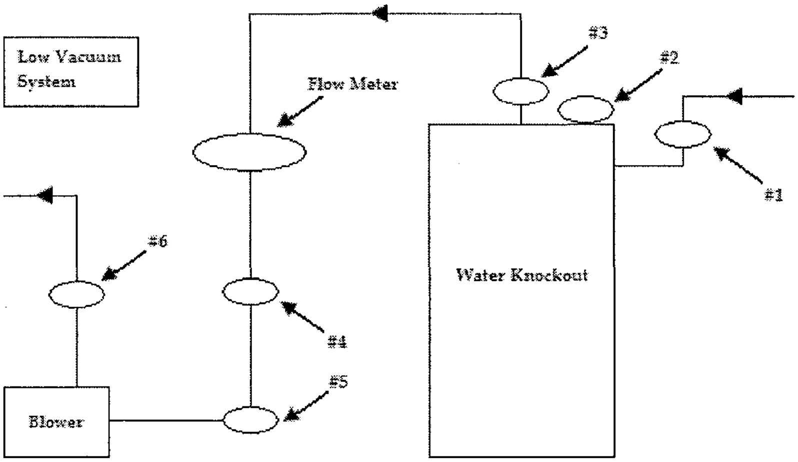
- The oil filter sight glass on the #1 air compressor was replaced.
- The auto float control on the air filter was replaced.

New System Problems or Newly Discovered Items Needing Repair

- None

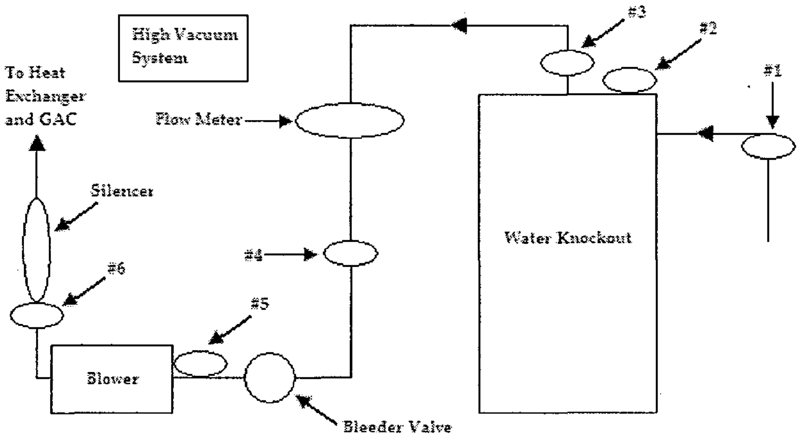
Other Activities

- None.



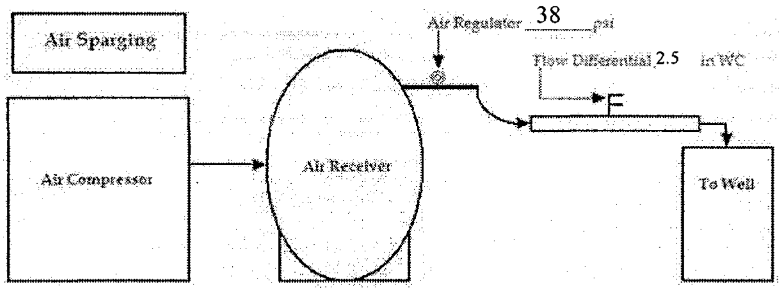
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-44.0 WC
#2	-4.1 Hg
#3	-44.0 WC
#4	-44.1 WC
#5	-46 WC
#6	+74.7 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	8/05/2009	11/06/2009	12717.8	12719.6	1.8
Air Compressor No. 2	8/05/2009	11/06/2009	13545.9	13682.2	136.3
Low Vacuum Blower No. 1	8/05/2009	11/06/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	8/05/2009	11/06/2009	4953.6	4953.6	0.0
High Vacuum Blower	8/05/2009	11/06/2009	27131.4	27266.2	190.6

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	8/05/2009	11/06/2009	13651.8	14376.3	724.5

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11-6-09

System Operator: S. Holmes
Weather: cloudy and warm
Temperature: Outside (°F): 65 **Inside (°F):** 70
System Operating Upon Arrival: YES [✓ NO]
If "No," what is the nature of the alarm? no Alarms / System was manually Shut Down Due to Extraction and quarterly monitoring activities

ART Well

Air Pressure Gauge 1 (Sparge Line):	—	psi	**Comments/Observations:**
Air Pressure Gauge 2 (Sparge Line):	—	psi	ART Well
Air Flow (Sparge Line):	—	scfm	Is off
Water Pressure (Recirc. Line):	—	psi	and Not Hooked
Water Flow Rate (Recirc. Line):	✓	gpm	up to System
CVE Vacuum:	—	in WC	
Packer Pressure:	—	psi	

System Operating Configuration

Compressor #1	Hand	[✓ Off]	[✓ Auto]	– But manually off at Compressor.
Compressor #2	Hand	[✓ Off]	Auto	Motor Runs
Low-Vac Blower #1	Hand	[✓ Off]	Auto	
Low-Vac Blower #2	Hand	[✓ Off]	Auto	
Low-Vac Transfer Pump	Hand	Off	[✓ Auto]	
High-Vac Blower	Hand	Off	[✓ Auto]	
Heat Exchanger	Hand	Off	[✓ Auto]	
High-Vac Transfer Pump	Hand	Off	[✓ Auto]	

System Panel Hours

Compressor #1:	12719.6	hrs
Compressor #2:	13682.2	hrs
Low-Vac Blower #1:	1865.9	hrs
Low-Vac Blower #2:	4953.6	hrs
High-Vac Blower:	17266.2	hrs
Totalized Liquid Flow:	14376.3	gallons

Air Sparging System

Date: 11-6-09

		Compressor #1		*Compressor #2*		
Air Pressure:	DNC	—	psi	—	psi	Checked
Percent Capacity:	N/A	—	%	—	%	During
Output Air Temperature:		—	°F	—	°F	10 minute Sparge Window

	Status			
Air Dryer #1 Running/Tested:	[✓ OK]	OFF		
Air Filter #1 Tested:	[✓ OK]	Differential Pressure:	0	psi
Air Filter #2 Tested:	[✓ OK]	Differential Pressure:	0	psi
Air Filter #3 Tested:	[✓ OK]	Differential Pressure:	0	psi

Date: 11/6/09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 118 °F
High-Vac Effluent Temperature: 85 °F
High-Vac Differential Pressure: 7.6 inches of water

High-Vac System

High-Vac at Knock-out Tank: 4.1 inches of Hg
High-Vac Blower Input Vacuum: ______ inches of water
High-Vac Air Flow: 3000 fpm 44.1 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 2.2 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 118 °F
High-Vac Exhaust Pressure at Heat Exchanger: +72.4 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 2.2 psi 0.0 ppm
High-Vac Effluent Midpoint C2: ↓ psi ↓ ppm
High-Vac Effluent Midpoint C3: ↓ psi ↓ ppm
High-Vac Effluent Outlet: NA psi NA ppm
→ need to install sample port

Ventilation System Data

Air Compressor #1 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

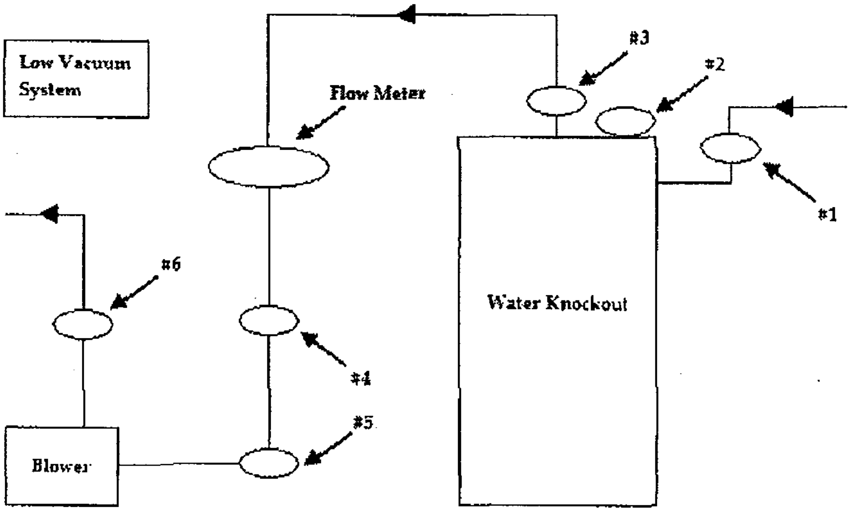
Heat Exchanger **Fan** ON OFF

High Vac Blower Room **Fan** ON [✓ OFF]

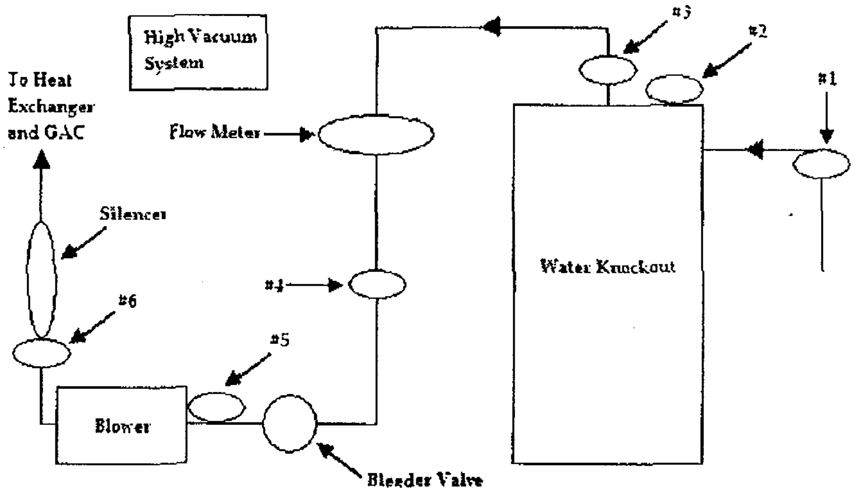
Building Dampers [✓ OPEN] CLOSED

Building Thermostat Set Point 50 °F

Date: 11/6/09

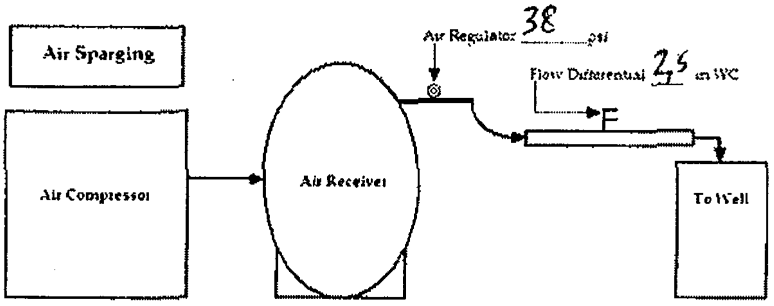


Sampling Point	+/- Inches WC/Hg
#1	- — WC
#2	- — Hg
#3	- — WC
#4	- — WC
#5	- — WC
#6	+ — WC



Sampling Point	+/- Inches WC/Hg
#1	-44.0 WC
#2	-4.1 Hg
#3	-44.0 WC
#4	-44.1 WC
#5	-46 WC
#6	+74.7 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



- Checked During 10 minute Sparge window

Date: 11/6/09

Maintenance Activities

Air Compressor #1 Oil Level: OK **Quantity Added:** 1 QT
Air Compressor #2 Oil Level: OK **Quantity Added:** 0 QT
High-Vac Blower Oil Level: OK **Quantity Added:** 0 QT

Repairs Made, Additional Comments and Notes

- Replaced oil Filter Sight Glass on compressor #1
- Replaced Auto Float Drain Control on Compressor #2
- 10 Minutes of monitored Air Sparge See Air Sparge Detail Sheet For List of open Valves. No upwelling observed
- Dewatered the High Vac SVE Lines.
- Cleaned In Building

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____

Weekly Data Collection **Monthly Well Inspection** (circle one)

Clay Vapor Extraction System Field Measurements			
Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
CVE-1			
CVE-2			
CVE-3			
CVE-4			
CVE-5			
CVE-6			
CVE-7			
CVE-8			
CVE-9			
CVE-10			
CVE-11			
CVE-12			
CVE-13			
CVE-14			
CVE-15			
CVE-16			
CVE-17			
CVE-18			
CVE-19			
CVE-20			
CVE-21			
CVE-22			
CVE-23			
CVE-24			
CVE-25			
CVE-26			
CVE-27			
CVE-28			
CVE-29			
CVE-30			
CVE-31			
CVE-32			
CVE-33			
CVE-34			
CVE-35			
CVE-36			
CVE-37			
CVE-38			
CVE-39			
CVE-40			
CVE-41			
CVE-42			
CVE-43			
CVE-44			
CVE-45			
CVE-46			
CVE-47			
PCIX-2D			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____________________

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Sand Vapor Extraction System Field Measurements			
Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
SVE-1			
SVE-2			
SVE-3			
SVE-4			
SVE-5			
SVE-6			
SVE-7			
SVE-8			
SVE-9			
CIX-2			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: Oct 8-9 and Oct 12

System Operator: Herb Scott

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Air Sparging Field Measurements			
Well	Valve (O/C/P)	Pressure (psi)	Comments
AS-1	O		
AS-2	O		
AS-3	O		
AS-4	O		
AS-5	O		
AS-6	O		
AS-7	O		
AS-8	O		
AS-9	O		
AS-10	O		
AS-11	O		
AS-12	O		
AS-13	O		
AS-14	C		Screen plugged - can't get flow through screen
AS-15	C		LBCA = Leak Between casing and Annulus
AS-16	C		LBCA
AS-17	O		
AS-18	C		LBCA
AS-19	O		
AS-20	O		
AS-21	O		
AS-22	O		
AS-23	O		
PCIX-1A	C		
PCIX-2A	C		
PCIX-5A	C		

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Stephen Holmes, HGL
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, November 6 to November 12, 2009.
Date: December 6, 2009

Introduction

On November 12, Stephen Holmes of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached November 12, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration. The air sparging system is being run on supervised basis only so personnel can be on site to monitor for groundwater upwelling. The attached check list details what air sparge wells are valved on during sparging activities. The ART well was taken off line during the groundwater recirculation pilot study in August. Finally the low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

Upon arrival the high vacuum system was running and the alarm light was off; however, air compressor #1 was running and it was left turned off on the air compressor control panel. It is unknown how the compressor restarted during this reporting period.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Automatic*	Automatic*
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Automatic	Automatic
High Vacuum System Blower	Automatic	Automatic
High Vacuum System Heat Exchanger	Automatic	Automatic
High Vacuum Water Transfer Pump	Automatic	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Open	Open
Building Thermostat	50°F	50°F

* Compressor shut off at compressor control panel and the air line to sparge galleries was valved off in the building.

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The air sparging operation conditions were documented during a 10 minute period of supervised sparging
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.
- The oil was changed in the high vacuum blower
- Ran supervised sparge operations approximately 50 minutes.

Non-routine Maintenance

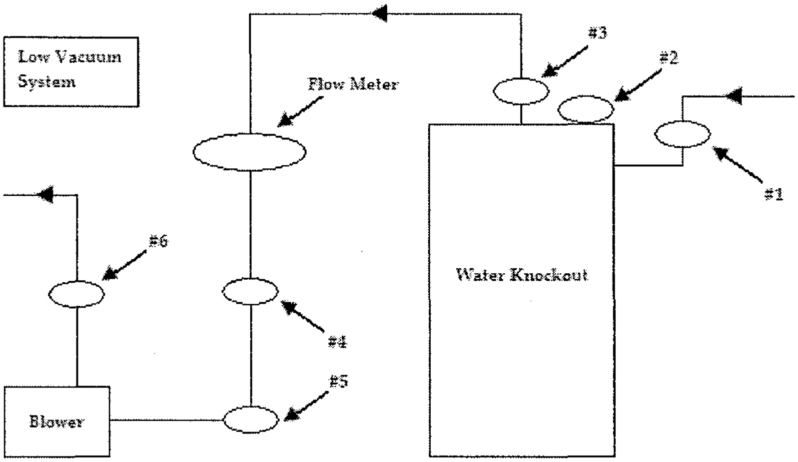
- None

New System Problems or Newly Discovered Items Needing Repair

- Air leaks were observed at the well heads of AS-8 and AS-9. Consequently, both AS wells were valved off at the well head.

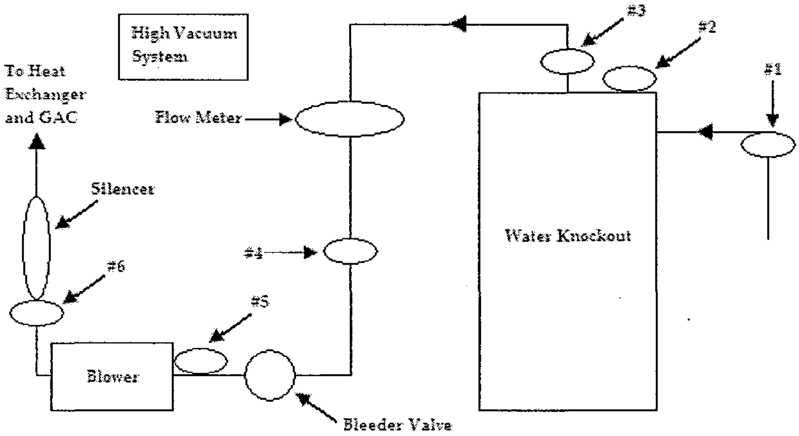
Other Activities

- None.



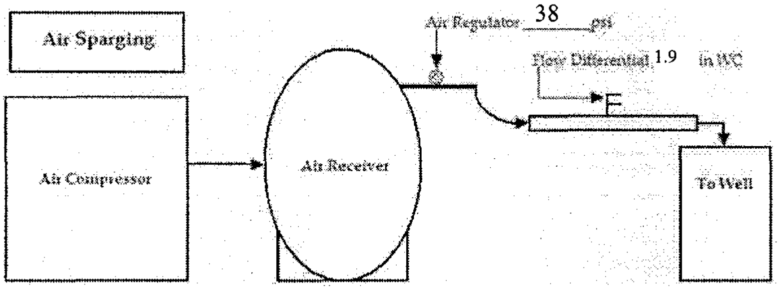
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-40.1 WC
#2	-4.0 Hg
#3	-40.6 WC
#4	-41.0 WC
#5	-41.8 WC
#6	+98.2 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	11/06/2009	11/12/2009	12719.6	12861.1	141.5
Air Compressor No. 2	11/06/2009	11/12/2009	13682.2	13682.2	136.3
Low Vacuum Blower No. 1	11/06/2009	11/12/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	11/06/2009	11/12/2009	4953.6	4953.6	0.0
High Vacuum Blower	11/06/2009	11/12/2009	27266.2	27408.5	142.3

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	11/06/2009	11/12/2009	14376.3	14549.8	173.5

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11-12-09

System Operator: S. Holmes
Weather: Cloudy and Cool
Temperature: Outside (°F): 53° Inside (°F): 90°
System Operating Upon Arrival: [✓ YES] NO
If "No," what is the nature of the alarm? High Vac Blower Running and Compressor # 1 Running.

ART Well

Air Pressure Gauge 1 (Sparge Line):	—	psi
Air Pressure Gauge 2 (Sparge Line):	—	psi
Air Flow (Sparge Line):	—	scfm
Water Pressure (Recirc. Line):	—	psi
Water Flow Rate (Recirc. Line):	—	gpm
CVE Vacuum:	—	in WC
Packer Pressure:	—	psi

Comments/Observations: ART Well Off Line.

System Operating Configuration

Compressor #1	Hand	Off	[✓ Auto]
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	Off	[✓ Auto]
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1:	~~27408.5~~	hrs	12861.9
Compressor #2:	13682.2	hrs	
Low-Vac Blower #1:	1885.9	hrs	
Low-Vac Blower #2:	4453.6	hrs	
High-Vac Blower:	27408.5	hrs	
Totalized Liquid Flow:	19549.8	gallons	

Air Sparging System

Date: 11-12-09

	Compressor #1		Compressor #2	
Air Pressure:	86	psi	—	psi
Percent Capacity:	63	%	—	%
Output Air Temperature:	180	°F	—	°F

	Status			
Air Dryer #1 Running/Tested:	[✓ OK]	OFF		
Air Filter #1 Tested:	[✓ OK]	Differential Pressure:	0	psi
Air Filter #2 Tested:	[✓ OK]	Differential Pressure:	0	psi
Air Filter #3 Tested:	[✓ OK]	Differential Pressure:	4	psi

Date: 11-12-09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 155 °F
High-Vac Effluent Temperature: 110 °F
High-Vac Differential Pressure: 6.6 inches of water

High-Vac System

High-Vac at Knock-out Tank: 4.0 inches of Hg
High-Vac Blower Input Vacuum: -41.8 inches of water
High-Vac Air Flow: 2,500 fpm 41.0 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 3.2 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 155 °F
High-Vac Exhaust Pressure at Heat Exchanger: +47 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1:	3.2	psi	0.0	ppm
High-Vac Effluent Midpoint C2:	—	psi	—	ppm
High-Vac Effluent Midpoint C3:	—	psi	—	ppm
High-Vac Effluent Outlet:	NA	psi	NA	ppm

Ventilation System Data

Air Compressor #1
Fan ~~ON~~ [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2
Fan ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

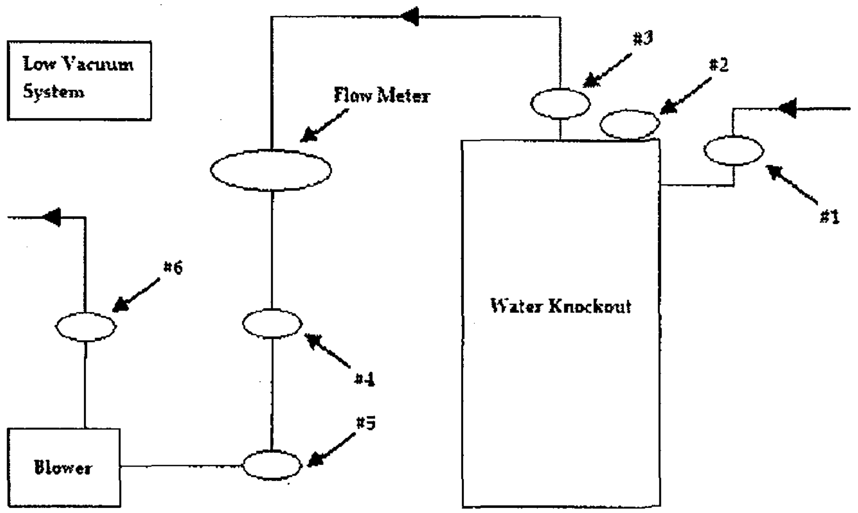
Heat Exchanger
Fan ~~ON~~ [✓ OFF]

High Vac Blower Room
Fan ON [✓ OFF]

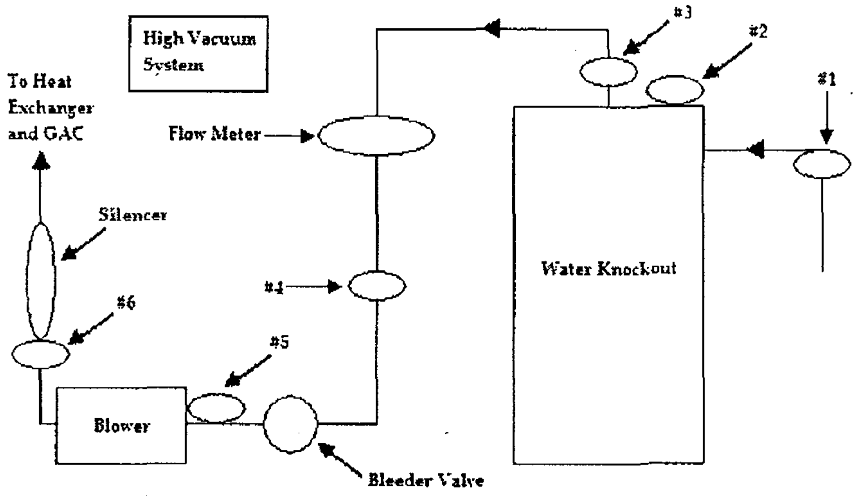
Building Dampers [✓ OPEN] CLOSED

Building Thermostat Set Point 50 °F

Date: 11/12/09

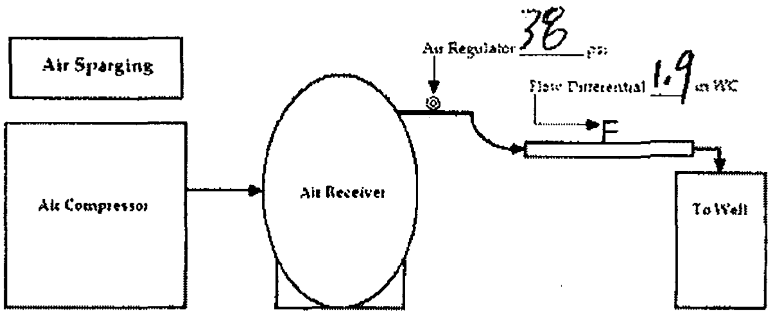


Sampling Point	+/- Inches WC/Hg
#1	-— WC
#2	-— Hg
#3	-— WC
#4	-— WC
#5	-— WC
#6	+— WC



Sampling Point	+/- Inches WC/Hg
#1	-40.1 WC
#2	4.0 -~~40.6~~ Hg
#3	-40.6 WC
#4	-41.0 WC
#5	-41.8 WC
#6	+98.2 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Air Regulator 38 psi

Flow Differential 1.9 in WC

Date: 11-12-09

Maintenance Activities

Air Compressor #1 Oil Level: [✓ OK] **Quantity Added:** 0 QT
Air Compressor #2 Oil Level: [✓ OK] **Quantity Added:** 0 QT
High-Vac Blower Oil Level: [✓ OK] **Quantity Added:** Changed QT

Repairs Made, Additional Comments and Notes

→ Ran sparging operations ≈ 50 minutes

→ Closed Air sparge wells 8 and 9 due to Air leaks at the well Head

→ Changed Oil in High Vac Blower ≈ 4 Liters @ ≈ 27400 Hrs

→ Conference call with Laura S, and JFS Brad Krause. Reset in System logic / Can't operate System w/o compressor coming on. Brad will Research and make a site visit on 11-24-09 to ~~Res~~ Try and Allow System to operate w Air compressor in off switch / Per CDM Laura S. Okay to Run System with compressors valved off.

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____

Weekly Data Collection **Monthly Well Inspection** (circle one)

Clay Vapor Extraction System Field Measurements			
Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
CVE-1			
CVE-2			
CVE-3			
CVE-4			
CVE-5			
CVE-6			
CVE-7			
CVE-8			
CVE-9			
CVE-10			
CVE-11			
CVE-12			
CVE-13			
CVE-14			
CVE-15			
CVE-16			
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CVE-29			
CVE-30			
CVE-31			
CVE-32			
CVE-33			
CVE-34			
CVE-35			
CVE-36			
CVE-37			
CVE-38			
CVE-39			
CVE-40			
CVE-41			
CVE-42			
CVE-43			
CVE-44			
CVE-45			
CVE-46			
CVE-47			
PCIX-2D			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11/12/09

System Operator:

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Sand Vapor Extraction System Field Measurements			
Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
SVE-1			
SVE-2			
SVE-3			
SVE-4			
SVE-5			
SVE-6			
SVE-7			
SVE-8			
SVE-9			
CIX-2			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11/12/09

System Operator:

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Air Sparging Field Measurements			
Well	Valve (O/C/P)	Pressure (psi)	Comments
AS-1	O		
AS-2	O		
AS-3	O		
AS-4	O		
AS-5	O		
AS-6	O		
AS-7	O		
AS-8	C	—	Closed Due to Air Leak at well Head
AS-9	C	—	Closed Due to Air Leak at well Head
AS-10			
AS-11	O		
AS-12	O		
AS-13	O		
AS-14	C	—	Closed Due To Air Leak Between Casing and Annulus (LBCA)
AS-15	C	—	LBCA
AS-16	C	—	LBCA
AS-17	O		
AS-18	C	—	LBCA
AS-19	O		
AS-20	O		
AS-21	O		
AS-22	O		
AS-23	O		
PCIX-1A			
PCIX-2A			
PCIX-5A			

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Stephen Holmes, HGL
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, November 12 to November 21, 2009.
Date: December 6, 2009

Introduction

On November 21, Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached November 21, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration. The air sparging system is being run on supervised basis only so personnel can be on site to monitor for groundwater upwelling. The attached check list details what air sparge wells are valved on during sparging activities. The ART well was taken off line during the groundwater recirculation pilot study in August. Finally the low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

Upon arrival the high vacuum system was running and the alarm light was off.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Automatic*	Automatic*
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Automatic	Automatic
High Vacuum System Blower	Automatic	Automatic
High Vacuum System Heat Exchanger	Automatic	Automatic
High Vacuum Water Transfer Pump	Automatic	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Open	Open
Building Thermostat	50°F	70°F

* Compressor shut off at compressor control panel and the air line to sparge galleries was valved off in the building.

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The air sparging operation conditions were documented during a 10 minute period of supervised sparging
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.
- Ran supervised sparge operations approximately 90 minutes.

Non-routine Maintenance

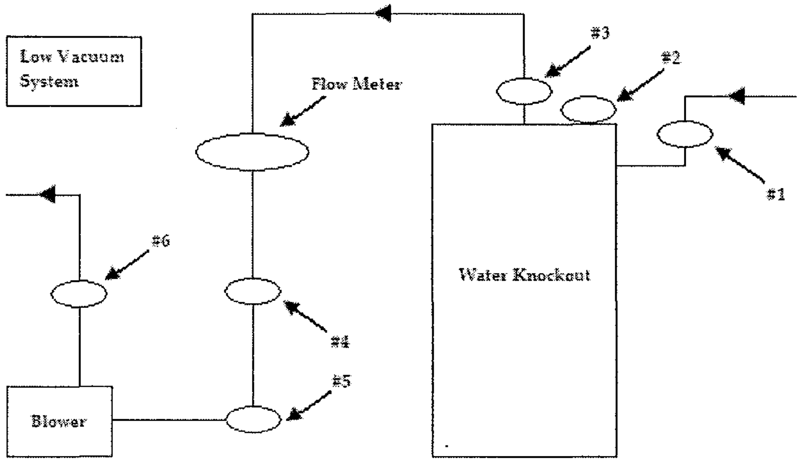
- Installed sampling port on the effluent of the air GAC tank
- Reinforced connection to air GAC influent connection.

New System Problems or Newly Discovered Items Needing Repair

- None

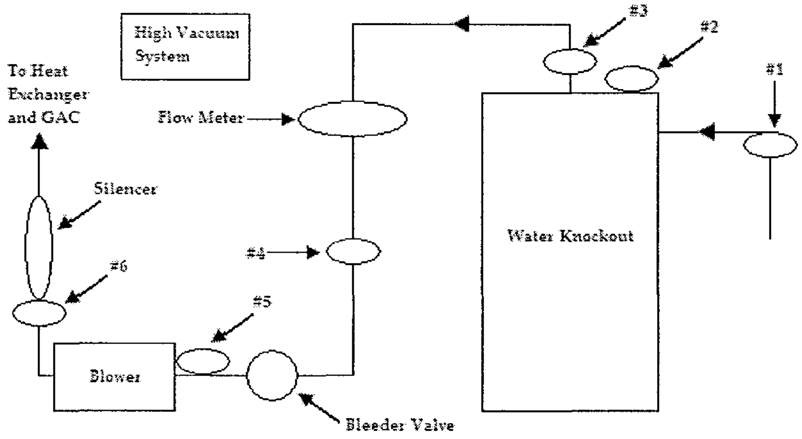
Other Activities

- None.



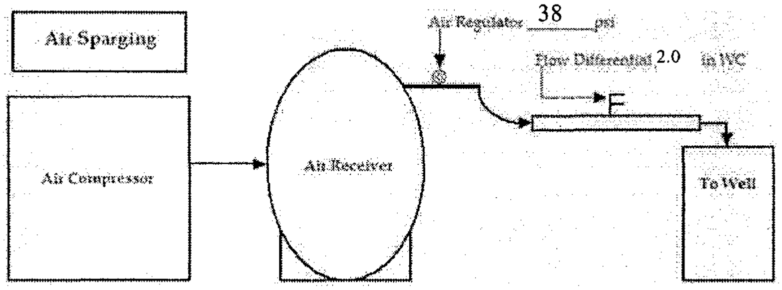
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-33.8 WC
#2	-4.0 Hg
#3	-35.3 WC
#4	-35.4 WC
#5	-36.7 WC
#6	+113.5 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	11/12/2009	11/21/2009	12861.1	13077.6	216.5
Air Compressor No. 2	11/12/2009	11/21/2009	13682.2	13682.2	0.0
Low Vacuum Blower No. 1	11/12/2009	11/21/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	11/12/2009	11/21/2009	4953.6	4953.6	0.0
High Vacuum Blower	11/12/2009	11/21/2009	27408.5	27624.2	215.7

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	11/12/2009	11/21/2009	14549.8	DNC	-

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11/21/09

System Operator: Mark Scott
Weather: Cool
Temperature: Outside (°F): 38 **Inside (°F):** 78
System Operating Upon Arrival: [✓ YES] NO
If "No," what is the nature of the alarm?

ART Well

Air Pressure Gauge 1 (Sparge Line): — psi
Air Pressure Gauge 2 (Sparge Line): — psi
Air Flow (Sparge Line): — scfm
Water Pressure (Recirc. Line): — psi
Water Flow Rate (Recirc. Line): — gpm
CVE Vacuum: — in WC
Packer Pressure: — psi

Comments/Observations:

System Operating Configuration

Compressor #1	[✓ Hand]	Off	Auto
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	[✓ Off]	Auto
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1: 170776 hrs
Compressor #2: 13682.4 hrs
Low-Vac Blower #1: 1885.9 hrs
Low-Vac Blower #2: 4957.6 hrs
High-Vac Blower: 22624.2 hrs
Totalized Liquid Flow: gallons

Air Sparging System

Date:

	Compressor #1	*Compressor #2*
Air Pressure:	92 psi	— psi
Percent Capacity:	59 %	— %
Output Air Temperature:	184 °F	— °F

	Status		
Air Dryer #1 Running/Tested:	[✓ OK]	OFF	
Air Filter #1 Tested:	[✓ OK]	Differential Pressure:	0 psi
Air Filter #2 Tested:	[✓ OK]	Differential Pressure:	0 psi
Air Filter #3 Tested:	[✓ OK]	Differential Pressure:	0 psi

Date: 11/21/09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 150.0 °F
High-Vac Effluent Temperature: 110.0 °F
High-Vac Differential Pressure: 5.0 inches of water

High-Vac System

High-Vac at Knock-out Tank: 5.8 inches of Hg
High-Vac Blower Input Vacuum: 6.0 inches of water
High-Vac Air Flow: 3200 fpm 0.60 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 3.8 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 150.0 °F
High-Vac Exhaust Pressure at Heat Exchanger: 111.6 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 3.8 psi 0 ppm
High-Vac Effluent Midpoint C2: — psi 0 ppm
High-Vac Effluent Midpoint C3: — psi 0 ppm
High-Vac Effluent Outlet: 0.0 psi 0 ppm

Ventilation System Data

Air Compressor #1 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

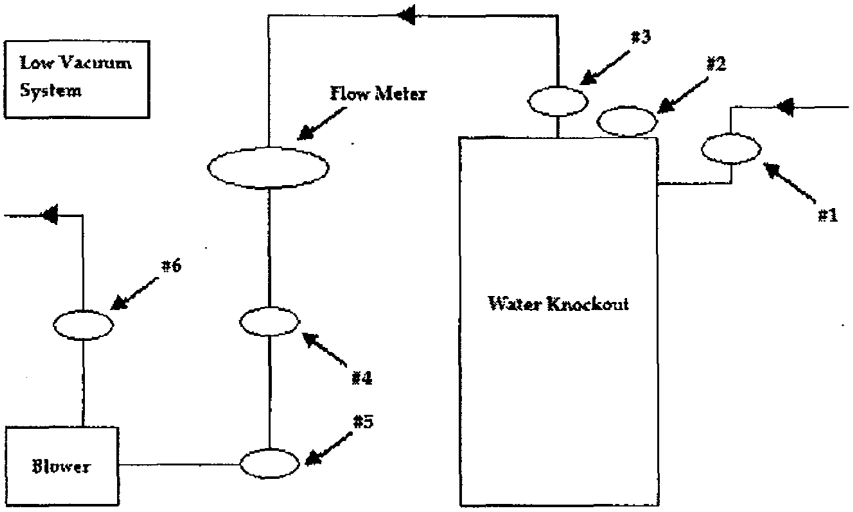
Heat Exchanger **Fan** ~~ON~~ [✓ OFF]

High Vac Blower Room **Fan** ~~ON~~ [✓ OFF]

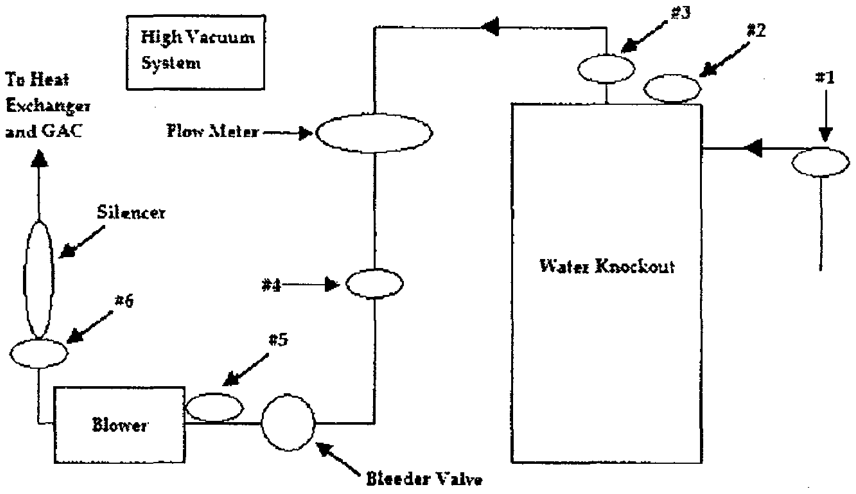
Building Dampers OPEN [✓ CLOSED]

Building Thermostat Set Point 70 °F

Date: 11/21/09

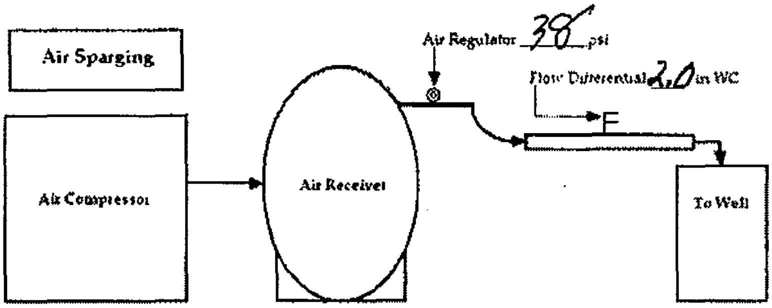


Sampling Point	+/- Inches WC/Hg
#1	- WC
#2	- Hg
#3	- WC
#4	- WC
#5	- WC
#6	+ WC



Sampling Point	+/- Inches WC/Hg
#1	-37.5 WC
#2	-11.0 Hg
#3	-75.3 WC
#4	-75.4 WC
#5	-36.7 WC
#6	+112.2 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Air Regulator 38 psi

Flow Differential 2.0 in WC

Date: ~~10~~ 11/12/09

Maintenance Activities

Air Compressor #1 Oil Level:	OK	**Quantity Added:** 0	QT
Air Compressor #2 Oil Level:	OK	**Quantity Added:** 0	QT
High-Vac Blower Oil Level:	OK	**Quantity Added:** 0	QT

Repairs Made, Additional Comments and Notes

- Sparged AS Wells ½ 1 Hr 30 Minutes
- Installed Sampling port on Effluent line of new GAC tank (Liq.)
- Reinforced Influent connection to new Air GAC tank

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Stephen Holmes, HGL
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, November 21 to November 24, 2009.
Date: December 6, 2009

Introduction

On November 24, Stephen Holmes of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached November 24, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration. The air sparging system is being run on supervised basis only so personnel can be on site to monitor for groundwater upwelling. The attached check list details what air sparge wells are valved on during sparging activities. The ART well was taken off line during the groundwater recirculation pilot study in August. Finally the low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

Upon arrival the high vacuum system was not running and the alarm light was off. The system's rain sensor had turned the system off.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Automatic*	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Automatic	Automatic
High Vacuum System Blower	Automatic	Automatic
High Vacuum System Heat Exchanger	Automatic	Automatic
High Vacuum Water Transfer Pump	Automatic	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Open	Open
Building Thermostat	70°F	70°F

* Compressor shut off at compressor control panel and the air line to sparge galleries was valved off in the building.

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The air sparging operation conditions were documented during a 10 minute period of supervised sparging
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.
- Dewatered high vacuum system lines.
- Ran supervised sparge operations approximately 1.4 hours.

Non-routine Maintenance

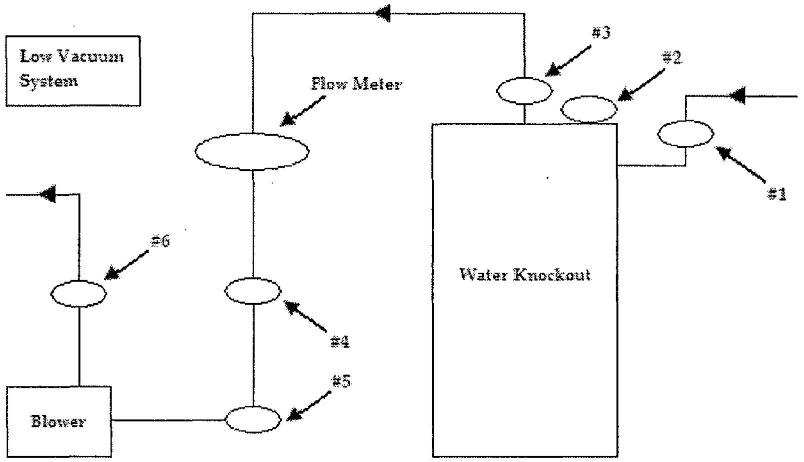
- The system logic was reprogrammed to allow the high and low vacuum systems to operate with the air compressor panel switches in the off position.

New System Problems or Newly Discovered Items Needing Repair

- At the end of supervised sparging activities, a minor groundwater upwelling event was observed and neutralized with a mixture of vinegar and hydrogen peroxide.

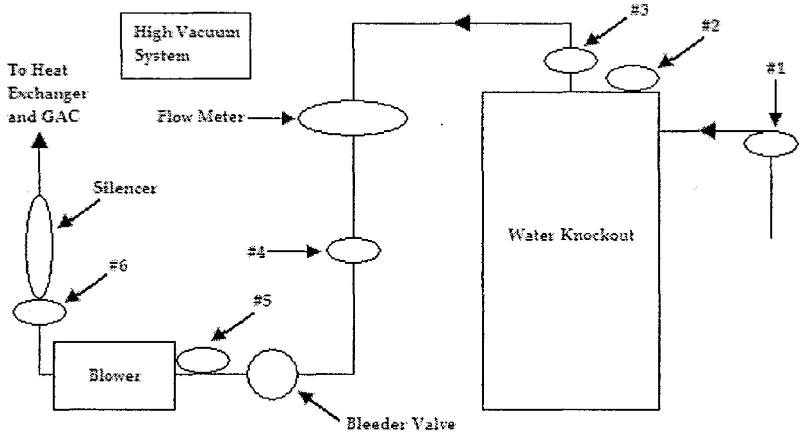
Other Activities

- None.



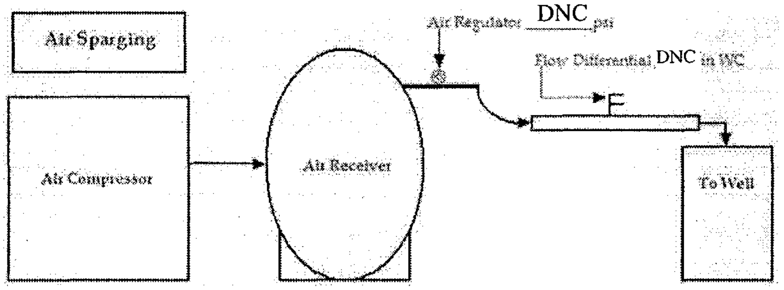
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-44.1 WC
#2	-4.0 Hg
#3	-41.3 WC
#4	-41.4 WC
#5	-42.4 WC
#6	+83.6 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	11/21/2009	11/24/2009	13077.6	13132.1	54.5
Air Compressor No. 2	11/21/2009	11/24/2009	13682.4	13682.2	0.0
Low Vacuum Blower No. 1	11/21/2009	11/24/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	11/21/2009	11/24/2009	4953.6	4953.6	0.0
High Vacuum Blower	11/21/2009	11/24/2009	27624.2	27678.7	54.5

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	11/12/2009	11/24/2009	14549.8	14574.6	24.8

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 11/24/09

System Operator: S. Holmes
Weather: Cloudy and cool
Temperature: Outside (°F): 38° **Inside (°F):** 62
System Operating Upon Arrival: YES [✓ NO]
If "No," what is the nature of the alarm? no Alarm Lights on System not Running ~~[illegible]~~ Rain sensor shut system Down -

ART Well

Air Pressure Gauge 1 (Sparge Line): — psi
Air Pressure Gauge 2 (Sparge Line): — psi
Air Flow (Sparge Line): — scfm
Water Pressure (Recirc. Line): — psi
Water Flow Rate (Recirc. Line): — gpm
CVE Vacuum: — in WC
Packer Pressure: — psi

Comments/Observations: ARTwell off Line.

System Operating Configuration

Compressor #1 Hand [✓ Off] Auto
Compressor #2 Hand [✓ Off] Auto
Low-Vac Blower #1 Hand [✓ Off] Auto
Low-Vac Blower #2 Hand [✓ Off] Auto
Low-Vac Transfer Pump Hand Off [✓ Auto]
High-Vac Blower Hand Off [✓ Auto]
Heat Exchanger Hand Off [✓ Auto]
High-Vac Transfer Pump Hand Off [✓ Auto]

System Panel Hours

Compressor #1: 13132.1 hrs
Compressor #2: 13682.2 hrs
Low-Vac Blower #1: 1985.9 hrs
Low-Vac Blower #2: 4953.6 hrs
High-Vac Blower: 27678.7 hrs
Totalized Liquid Flow: 14574.6 gallons

Air Sparging System

Date:

	Compressor #1	*Compressor #2*
Air Pressure:	90 psi	— psi
Percent Capacity:	58 %	— %
Output Air Temperature:	178 °F	— °F

Status

Air Dryer #1 Running/Tested: [✓ OK] OFF
Air Filter #1 Tested: [✓ OK] Differential Pressure: 0 psi
Air Filter #2 Tested: [✓ OK] Differential Pressure: 0 psi
Air Filter #3 Tested: [✓ OK] Differential Pressure: 0.5 psi

Date: 11/24/09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 140 °F
High-Vac Effluent Temperature: 95 °F
High-Vac Differential Pressure: ______ inches of water

High-Vac System

High-Vac at Knock-out Tank: 4.0 inches of Hg
High-Vac Blower Input Vacuum: 42.4 inches of water
High-Vac Air Flow: 2,500 fpm 41.4 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 3.4 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 140 °F
High-Vac Exhaust Pressure at Heat Exchanger: 102.3 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1:	3.4	psi	0.6	ppm
High-Vac Effluent Midpoint C2:	↓	psi	↓	ppm
High-Vac Effluent Midpoint C3:	↓	psi	↓	ppm
High-Vac Effluent Outlet:	0.0	psi	0.0	ppm

Ventilation System Data

Air Compressor #1 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

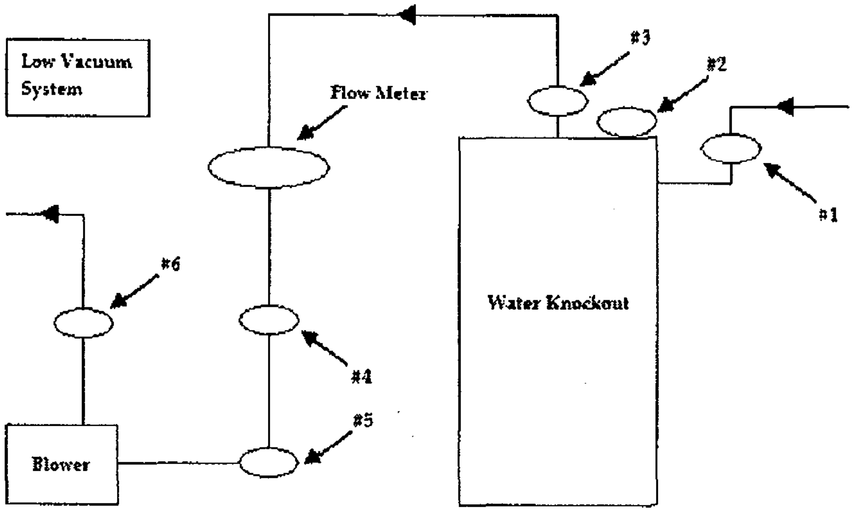
Heat Exchanger **Fan** ON [✓ OFF]

High Vac Blower Room **Fan** ON [✓ OFF]

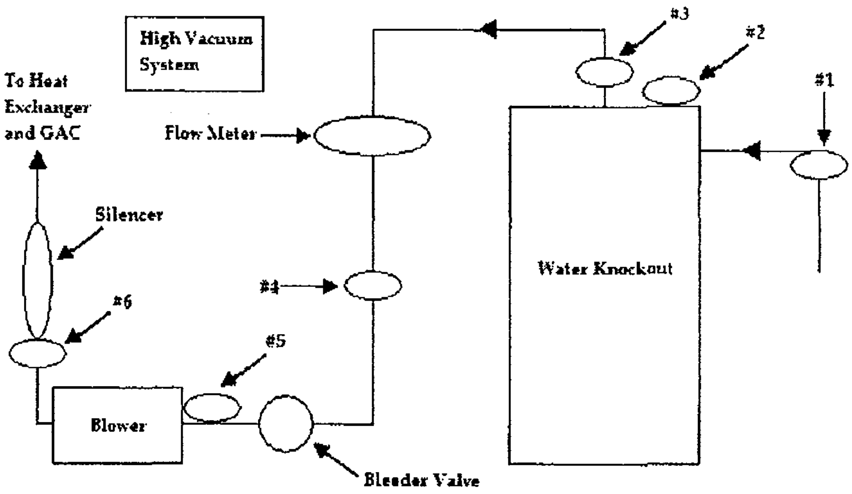
Building Dampers OPEN [✓ CLOSED]

Building Thermostat Set Point 70 °F

Date: 11-24-09

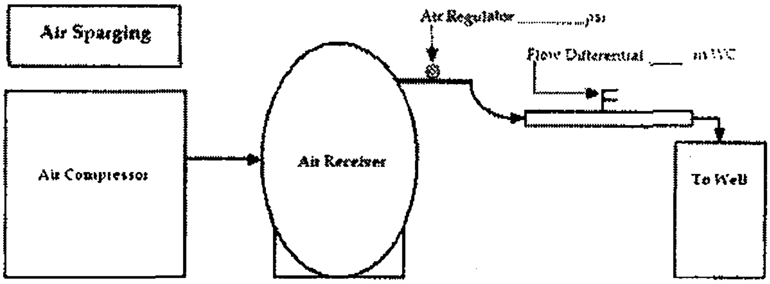


Sampling Point	+/- Inches WC/Hg
#1	- — WC
#2	- — Hg
#3	- — WC
#4	- — WC
#5	- — WC
#6	+ — WC



Sampling Point	+/- Inches WC/Hg
#1	-41.4 WC
#2	-4.0 Hg
#3	-41.3 WC
#4	-41.4 WC
#5	-42.4 WC
#6	+83.6 WC

- #1 - Pre-Knock-Out Tank Pete's Plug®
- #2 - Vacuum Gauge
- #3 - Post-Knock-Out Tank Pete's Plug®
- #4 - Post-Flow Meter Pete's Plug®
- #5 - Pre-Blower
- #6 - Post-Blower



Date: 11/24/09

Maintenance Activities

Air Compressor #1 Oil Level:	OK	**Quantity Added:**	0	QT
Air Compressor #2 Oil Level:	OK	**Quantity Added:**	0	QT
High-Vac Blower Oil Level:	OK	**Quantity Added:**	0	QT

Repairs Made, Additional Comments and Notes

Brad Krause on site Reprogramming system logic to allow High Vac Blower to run w/o ~~Compr~~ Compressors

Bypassed Air Compressor #1 & #2 'Auto' mode for the line of code that controls the High Vac compressor & the High Vac Heat Exchanger. This allows the system to ~~ru~~ be run without the Air Compressors.

- Dewatered High Vac Lines 1.4
- Monitored Air Sparge operations ~~2 to 25~~ hrs Sparge
-

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Herb Scott
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, November 24, 2009 to December 3, 2009.
Date: January 11, 2010

Introduction

On December 3, Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached December 3, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration and was operating normally upon arrival. The air sparging system is not being operated due to groundwater upwelling. The low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Off	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Off
High Vacuum System Blower	Automatic	Automatic
High Vacuum System Heat Exchanger	Automatic	Automatic
High Vacuum Water Transfer Pump	Automatic	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Closed	Closed
Building Thermostat	70°F	70°F

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.

Non-routine Maintenance

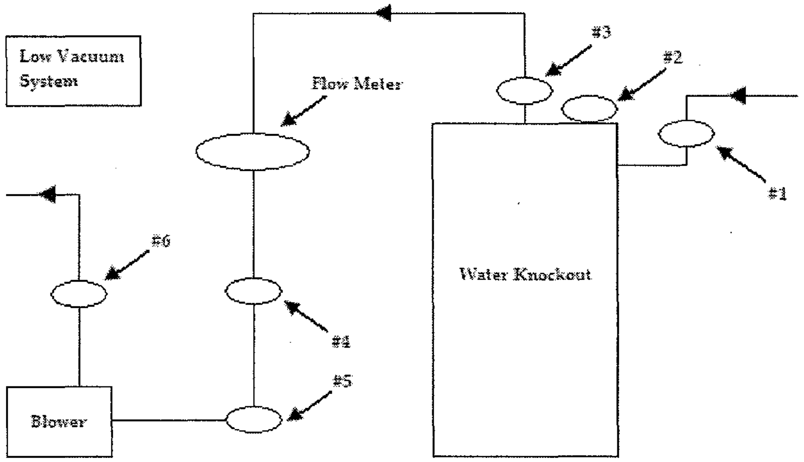
- None

New System Problems or Newly Discovered Items Needing Repair

- None.

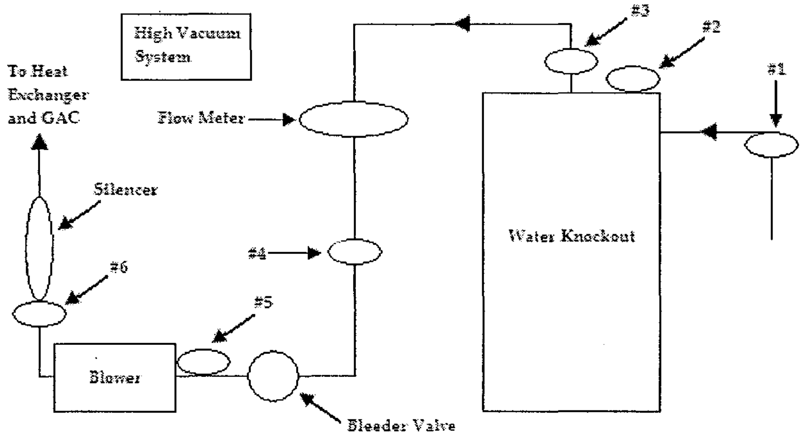
Other Activities

- None.



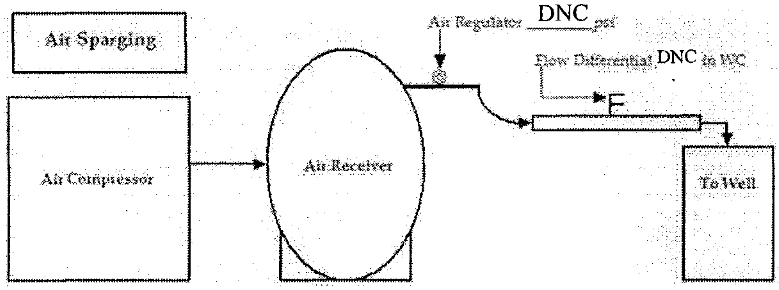
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-30.5 WC
#2	-3.5 Hg
#3	-31.7 WC
#4	-32.0 WC
#5	-33.9 WC
#6	+115.0 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	11/24/2009	12/03/2009	13132.1	13133.5	1.5
Air Compressor No. 2	11/24/2009	12/03/2009	13682.4	13682.2	0.0
Low Vacuum Blower No. 1	11/24/2009	12/03/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	11/24/2009	12/03/2009	4953.6	4953.6	0.0
High Vacuum Blower	11/24/2009	12/03/2009	27678.7	27875.8	197.1

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	11/24/2009	12/03/2009	14574.6	15005.4	430.8

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 12/31/04

System Operator: H. Scott
Weather: Cold Flurries
Temperature: Outside (°F): 28 **Inside (°F):** 64
System Operating Upon Arrival: [✓ YES] NO
If "No," what is the nature of the alarm?

ART Well

Air Pressure Gauge 1 (Sparge Line):	—	psi
Air Pressure Gauge 2 (Sparge Line):	—	psi
Air Flow (Sparge Line):	—	scfm
Water Pressure (Recirc. Line):	—	psi
Water Flow Rate (Recirc. Line):	—	gpm
CVE Vacuum:	—	in WC
Packer Pressure:	—	psi

Comments/Observations:

System Operating Configuration

Compressor #1	Hand	[✓ Off]	Auto
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	[✓ Off]	Auto
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1:	13133.6	hrs
Compressor #2:	13692.2	hrs
Low-Vac Blower #1:	1885.9	hrs
Low-Vac Blower #2:	4953.6	hrs
High-Vac Blower:	27975.8	hrs
Totalized Liquid Flow:	15005.7	gallons

Air Sparging System

Date:

	Compressor #1		*Compressor #2*	
Air Pressure:	—	psi	—	psi
Percent Capacity:	—	%	—	%
Output Air Temperature:	—	°F	—	°F

	Status			
Air Dryer #1 Running/Tested:	~~OK~~	OFF		
Air Filter #1 Tested:	~~OK~~	Differential Pressure:	—	psi
Air Filter #2 Tested:	~~OK~~	Differential Pressure:	—	psi
Air Filter #3 Tested:	~~OK~~	Differential Pressure:	—	psi

Date: 12/3/09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: ______ fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 140 °F
High-Vac Effluent Temperature: [illegible] °F
High-Vac Differential Pressure: [illegible] inches of water

High-Vac System

High-Vac at Knock-out Tank: [illegible] inches of Hg
High-Vac Blower Input Vacuum: [illegible] inches of water
High-Vac Air Flow: 3000 fpm 55 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 4.2 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 140 °F
High-Vac Exhaust Pressure at Heat Exchanger: 119.5 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 4.2 psi 0.0 ppm
High-Vac Effluent Midpoint C2: — psi — ppm
High-Vac Effluent Midpoint C3: — psi — ppm
High-Vac Effluent Outlet: 0.0 psi 0.0 ppm

Ventilation System Data

Air Compressor #1 Fan ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2 Fan ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

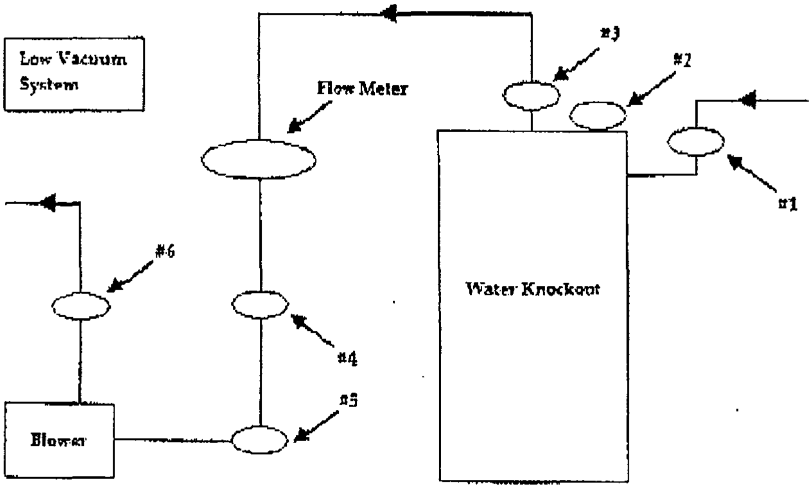
Heat Exchanger Fan ON OFF

High Vac Blower Room Fan ON [✓ OFF]

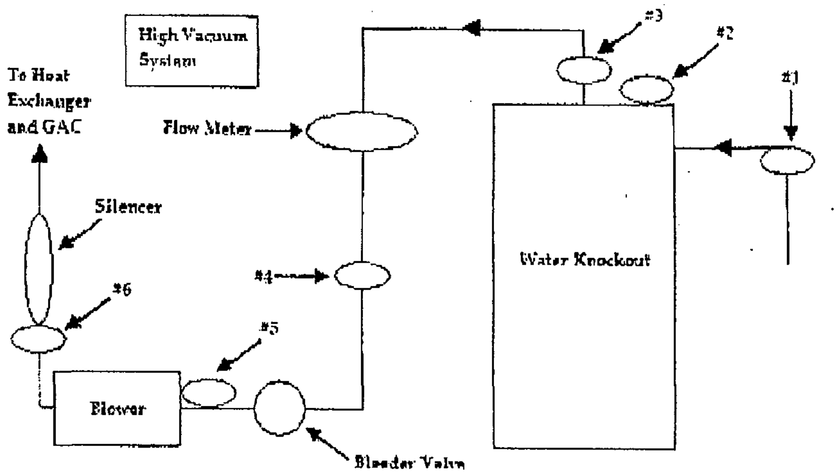
Building Dampers OPEN [✓ CLOSED]

Building Thermostat Set Point 70 °F

Date: 12/3/09

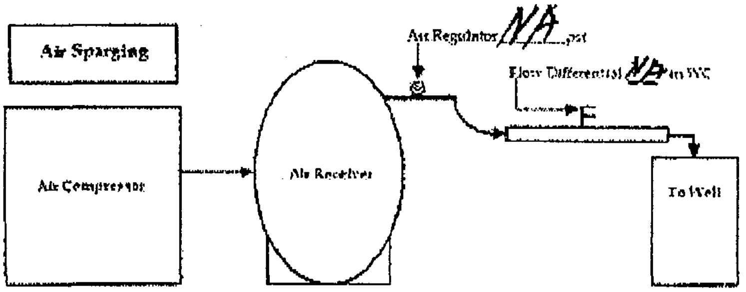


Sampling Point	+/- Inches WC/Hg
#1	- / WC
#2	- / Hg
#3	- / WC
#4	- / WC
#5	- / WC
#6	+ / WC



Sampling Point	+/- Inches WC/Hg
#1	-30.5 WC
#2	-3.5 Hg
#3	-31.7 WC
#4	-32.0 WC
#5	-22.9 WC
#6	+115.2 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Air Regulator NA psi

Flow Differential NA in WC

Date: 12/3/09

Maintenance Activities

Air Compressor #1 Oil Level: OK **Quantity Added:** — QT
Air Compressor #2 Oil Level: OK **Quantity Added:** — QT
High-Vac Blower Oil Level: OK **Quantity Added:** — QT

Repairs Made, Additional Comments and Notes

Turned off Air Dryer

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Herb Scott
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, December 3, 2009 to December 10, 2009
Date: January 11, 2010

Introduction

On December 10, Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached December 10, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration and was operating normally upon arrival. The air sparging system is not being operated due to groundwater upwelling. The low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Off	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Off
High Vacuum System Blower	Automatic	Automatic
High Vacuum System Heat Exchanger	Automatic	Automatic
High Vacuum Water Transfer Pump	Automatic	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Closed	Closed
Building Thermostat	70°F	70°F

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented.

Non-routine Maintenance

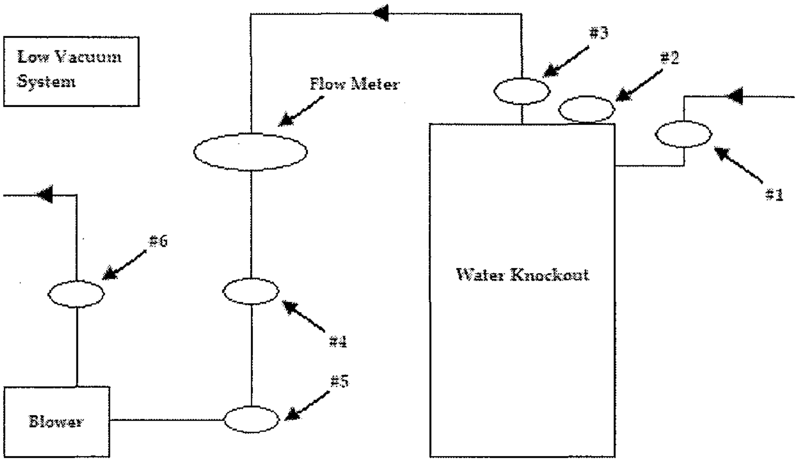
- None.

New System Problems or Newly Discovered Items Needing Repair

- None.

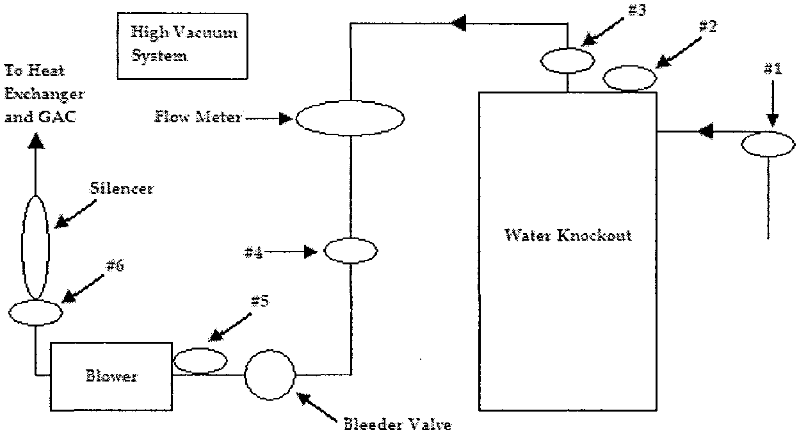
Other Activities

- None.



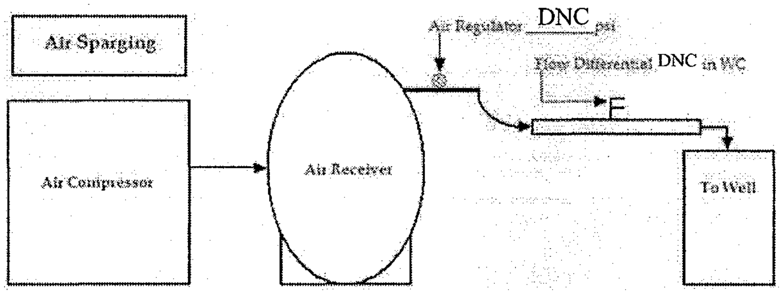
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-30.3 WC
#2	-3.5 Hg
#3	-31.4 WC
#4	-32.0 WC
#5	-33.7 WC
#6	+115.0 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	12/03/2009	12/10/2009	13133.5	13133.5	0.0
Air Compressor No. 2	12/03/2009	12/10/2009	13682.2	13682.2	0.0
Low Vacuum Blower No. 1	12/03/2009	12/10/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	12/03/2009	12/10/2009	4953.6	4953.6	0.0
High Vacuum Blower	12/03/2009	12/10/2009	27875.8	28033.7	157.9

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	12/03/2009	12/10/2009	15005.4	15081.1	75.7

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 12/10/09

System Operator: H Scott
Weather: cold
Temperature: Outside (°F): -6 **Inside (°F):** 62
System Operating Upon Arrival: [✓ YES] NO
If "No," what is the nature of the alarm? ______

ART Well

Air Pressure Gauge 1 (Sparge Line):		psi
Air Pressure Gauge 2 (Sparge Line):		psi
Air Flow (Sparge Line):		scfm
Water Pressure (Recirc. Line):		psi
Water Flow Rate (Recirc. Line):		gpm
CVE Vacuum:		in WC
Packer Pressure:		psi

Comments/Observations:

System Operating Configuration

Compressor #1	Hand	[✓ Off]	Auto
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	[✓ Off]	Auto
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand.	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1:	13133.5	hrs
Compressor #2:	13682.2	hrs
Low-Vac Blower #1:	1885.9	hrs
Low-Vac Blower #2:	4953.6	hrs
High-Vac Blower:	28022.9	hrs
Totalized Liquid Flow:	[illegible]	gallons

Air Sparging System

Date:

	Compressor #1		*Compressor #2*	
Air Pressure:	-	psi	-	psi
Percent Capacity:	-	%	-	%
Output Air Temperature:	-	°F	-	°F

	Status				
Air Dryer #1 Running/Tested:	~~OK~~	OFF			
Air Filter #1 Tested:	~~OK~~		Differential Pressure:	-	psi
Air Filter #2 Tested:	~~OK~~		Differential Pressure:	-	psi
Air Filter #3 Tested:	~~OK~~		Differential Pressure:	-	psi

OHM AS/SVE System
System Checklist

Date: 12/10/09

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 120 °F
High-Vac Effluent Temperature: 80 °F
High-Vac Differential Pressure: 5.0 inches of water

High-Vac System

High-Vac at Knock-out Tank: 3.5 inches of Hg
High-Vac Blower Input Vacuum: 77.7 inches of water
High-Vac Air Flow: 3400 fpm 0.75 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 4.7 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 120 °F
High-Vac Exhaust Pressure at Heat Exchanger: 118.7 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 4.7 psi 0.0 ppm
High-Vac Effluent Midpoint C2: — psi — ppm
High-Vac Effluent Midpoint C3: — psi — ppm
High-Vac Effluent Outlet: 0.0 psi 0.0 ppm

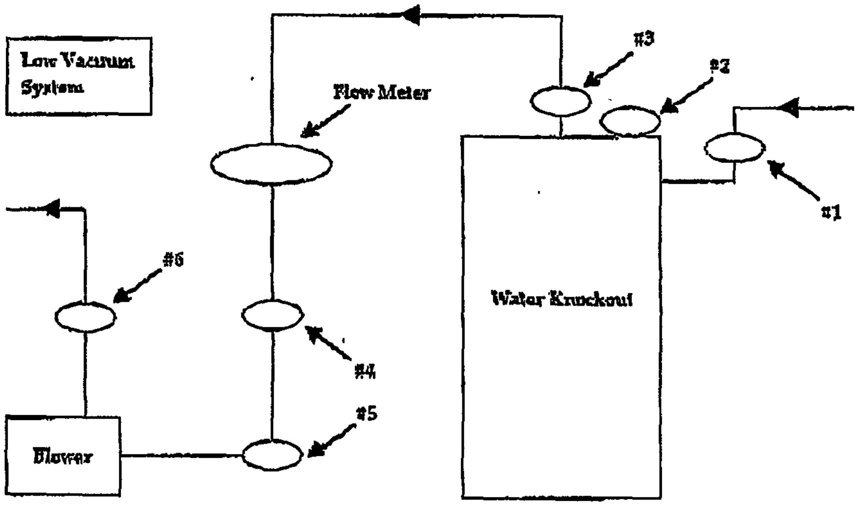
Ventilation System Data

Air Compressor #1	**Fan**	ON	[✓ OFF]
	Air Gates	OPEN	[✓ CLOSED]
Air Compressor #2	**Fan**	ON	[✓ OFF]
	Air Gates	OPEN	[✓ CLOSED]
Heat Exchanger	**Fan**	ON	[✓ OFF]
High Vac Blower Room	**Fan**	ON	[✓ OFF]
Building Dampers		OPEN	[✓ CLOSED]

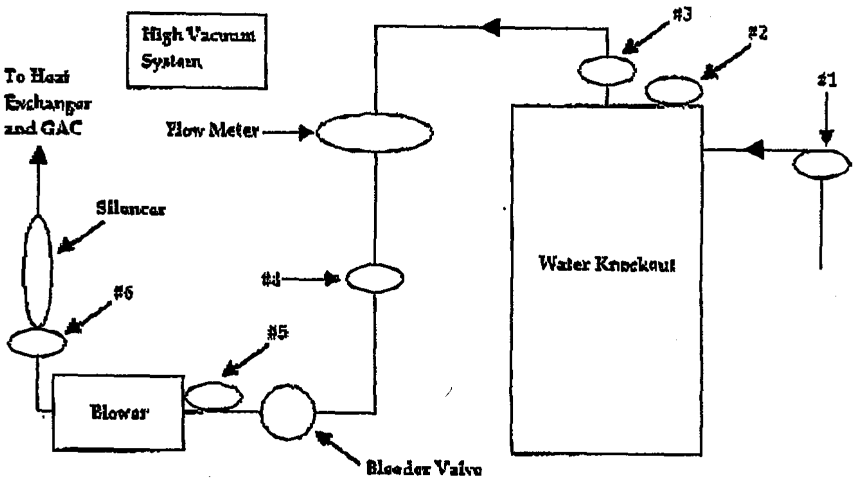
Building Thermostat Set Point 70 °F

OHM AS/SVE System
System Checklist

Date: 12/10/09

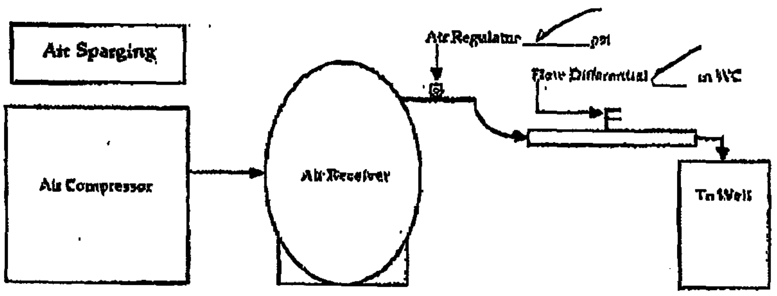


Sampling Point	**+/- Inches WC/Hg**
#1	- WC
#2	- Hg
#3	- WC
#4	- WC
#5	- WC
#6	+ WC



Sampling Point	**+/- Inches WC/Hg**
#1	-31.7 WC
#2	-3.5 Hg
#3	-36.4 WC
#4	-22.0 WC
#5	-22.7 WC
#6	+[illegible] WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Date: 12/10/09

Maintenance Activities

Air Compressor #1 Oil Level: [✓ OK] **Quantity Added:** — QT
Air Compressor #2 Oil Level: [✓ OK] **Quantity Added:** — QT
High-Vac Blower Oil Level: [✓ OK] **Quantity Added:** — QT

Repairs Made, Additional Comments and Notes

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Herb Scott
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, December 10, 2009 to December 22, 2009
Date: January 11, 2010

Introduction

On December 22, Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached December 22, 2009 system checklist.

The high vacuum CVE component of the system is the only system component operating in a continuous unsupervised configuration and was not operating normally upon arrival. The air exchanger blower motor had failed causing the system to shut down.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Off	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Off
High Vacuum System Blower	Automatic	Off
High Vacuum System Heat Exchanger	Automatic	Off
High Vacuum Water Transfer Pump	Automatic	Off
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Closed	Closed
Building Thermostat	70°F	70°F

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was not documented as the system is down.

Non-routine Maintenance

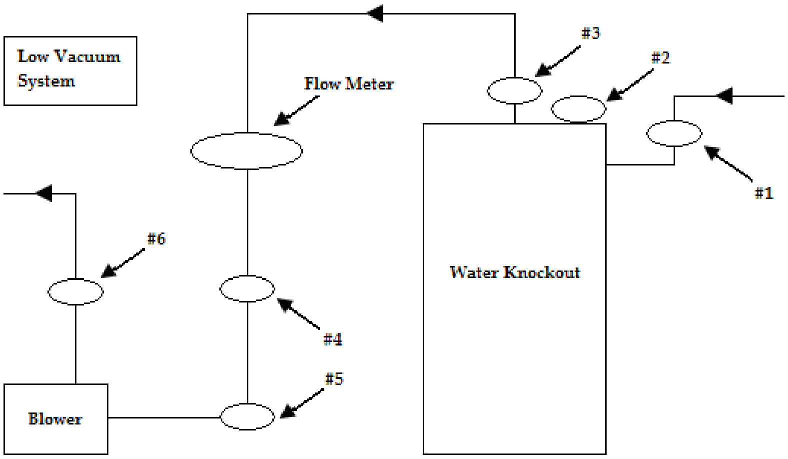
- The system was down upon arrival. Troubleshooting efforts revealed that the motor on the heat exchanger had failed causing the system to shut down. With EPA approval a new motor was ordered and arrangements were made with IES electric to have the replacement motor installed the week of January 4, 2010. All efforts were made to keep the system components from freezing up while the system was down awaiting the replacement motor to arrive.

New System Problems or Newly Discovered Items Needing Repair

- None.

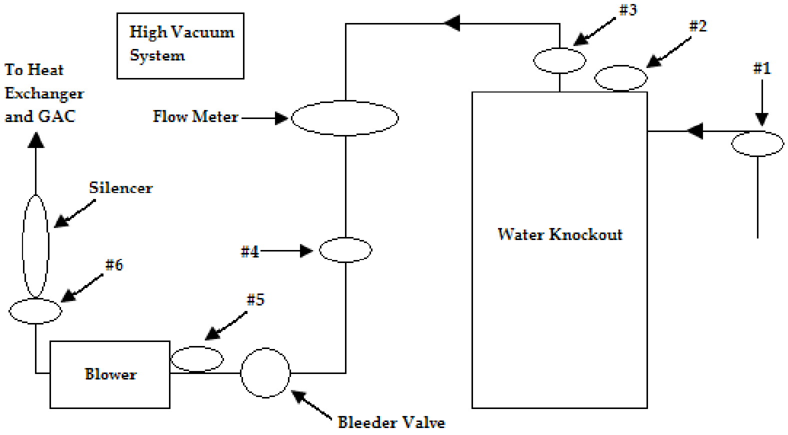
Other Activities

- None.



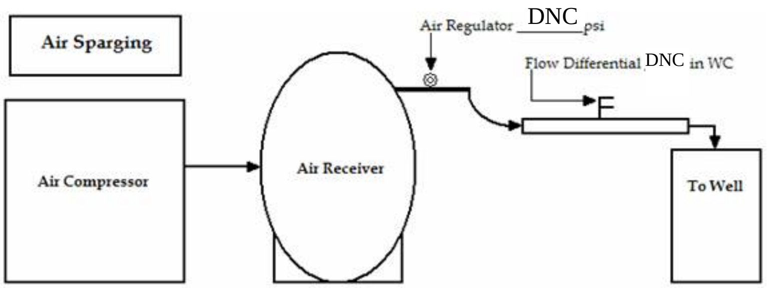
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Air Regulator DNC psi

Flow Differential DNC in WC

System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	12/10/2009	12/22/2009	13133.5	13133.5	0.0
Air Compressor No. 2	12/10/2009	12/22/2009	13682.2	13682.2	0.0
Low Vacuum Blower No. 1	12/10/2009	12/22/2009	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	12/10/2009	12/22/2009	4953.6	4953.6	0.0
High Vacuum Blower	12/10/2009	12/22/2009	28033.7	28225.7	192.0

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	12/10/2009	12/22/2009	15081.1	15081.1	0.0

Attachments

Weekly System Checklist

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Herb Scott
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, December 22, 2009 to January 4, 2010
Date: January 11, 2010

Introduction

On January 4, 2010 Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached January 4, 2010 system checklist.

In the current system operating configuration the high vacuum CVE component of the system is the only system component operating in a continuous unsupervised manner. The air sparging system is not being operated due to groundwater upwelling. The low vacuum system remains off line to prevent excessive amounts of water from being processed through the system during times of high groundwater levels at the site.

Upon arrival the high vacuum CVE component of the system was manually shut down. The air exchanger blower had failed during the previous reporting period and the system was down awaiting replacement parts to arrive.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	**Status Arrival**	**Status Departure**
Air Compressor No. 1	Off	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Off
High Vacuum System Blower	Off	Automatic
High Vacuum System Heat Exchanger	Off	Automatic
High Vacuum Water Transfer Pump	Off	Automatic
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Closed	Closed
Building Thermostat	70°F	70°F

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.

- The high vacuum system temperature, pressure, and flow volume data was documented upon system start up.

Non-routine Maintenance

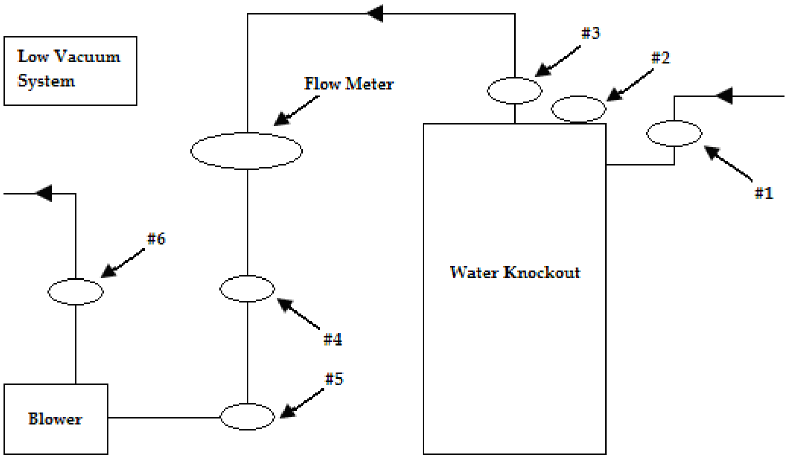
- IES Electric Marv Zoucha replaced and tested the fan motor on the heat exchanger.
- Purchased a portable 1500 Watt heater to thaw out the liquid knockout tank and associated plumbing. .
- Reassembled plumbing to the liquid knock out tanks and restarted the system.
- Adjusted the operating vacuum in the high vacuum system to -3.0 hg at the knockout tank and resumed operation of the system.

New System Problems or Newly Discovered Items Needing Repair

- None.

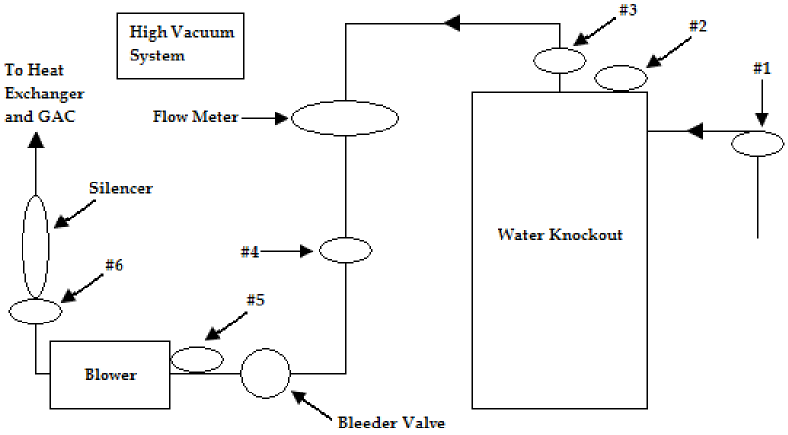
Other Activities

- None.



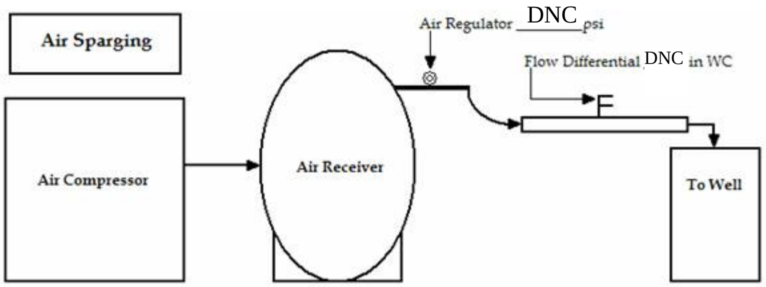
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	-20.9 WC
#2	-3.0 hg
#3	-21.1 WC
#4	-21.8 WC
#5	-23.6 WC
#6	+118.1 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	12/22/2009	1/04/2010	13133.5	13133.5	0.0
Air Compressor No. 2	12/22/2009	1/04/2010	13682.4	13682.2	0.0
Low Vacuum Blower No. 1	12/22/2009	1/04/2010	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	12/22/2009	1/04/2010	4953.6	4953.6	0.0
High Vacuum Blower	12/22/2009	1/04/2010	28225.7	28225.7	0.0

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	12/22/2009	1/04/2010	15081.1	15081.1	0.0

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 1/04/2010

System Operator: H Scott
Weather: cold
Temperature: Outside (°F): 28 **Inside (°F):** 56°
System Operating Upon Arrival: YES [✓ NO]
If "No," what is the nature of the alarm? Heat alarm

ART Well

Air Pressure Gauge 1 (Sparge Line): — psi
Air Pressure Gauge 2 (Sparge Line): — psi
Air Flow (Sparge Line): — scfm
Water Pressure (Recirc. Line): — psi
Water Flow Rate (Recirc. Line): — gpm
CVE Vacuum: — in WC
Packer Pressure: — psi

Comments/Observations:

System Operating Configuration

Compressor #1	Hand	[✓ Off]	Auto
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	[✓ Off]	Auto
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1: 13133.5 hrs
Compressor #2: 13682.2 hrs
Low-Vac Blower #1: 1885.9 hrs
Low-Vac Blower #2: 4953.6 hrs
High-Vac Blower: 28225.7 hrs
Totalized Liquid Flow: 15081.1 gallons

Air Sparging System

Date:

	Compressor #1	*Compressor #2*
Air Pressure:	— psi	— psi
Percent Capacity:	— %	— %
Output Air Temperature:	— °F	— °F

	Status		
Air Dryer #1 Running/Tested:	~~OK~~	OFF	
Air Filter #1 Tested:	~~OK~~	Differential Pressure:	— psi
Air Filter #2 Tested:	~~OK~~	Differential Pressure:	— psi
Air Filter #3 Tested:	~~OK~~	Differential Pressure:	— psi

OHM AS/SVE System
System Checklist

Date: 1/4/2010

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 125 °F
High-Vac Effluent Temperature: 60 °F
High-Vac Differential Pressure: — inches of water

High-Vac System

High-Vac at Knock-out Tank: 2.5 inches of Hg
High-Vac Blower Input Vacuum: 23.6 inches of water
High-Vac Air Flow: 4900 fpm 0.5 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 4.9 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 125 °F
High-Vac Exhaust Pressure at Heat Exchanger: 140.1 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 4.9 psi 0.0 ppm
High-Vac Effluent Midpoint C2: — psi — ppm
High-Vac Effluent Midpoint C3: — psi — ppm
High-Vac Effluent Outlet: 0.0 psi 0.0 ppm

Ventilation System Data

Air Compressor #1 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Air Compressor #2 **Fan** ON [✓ OFF]
Air Gates OPEN [✓ CLOSED]

Heat Exchanger **Fan** ON [✓ OFF]

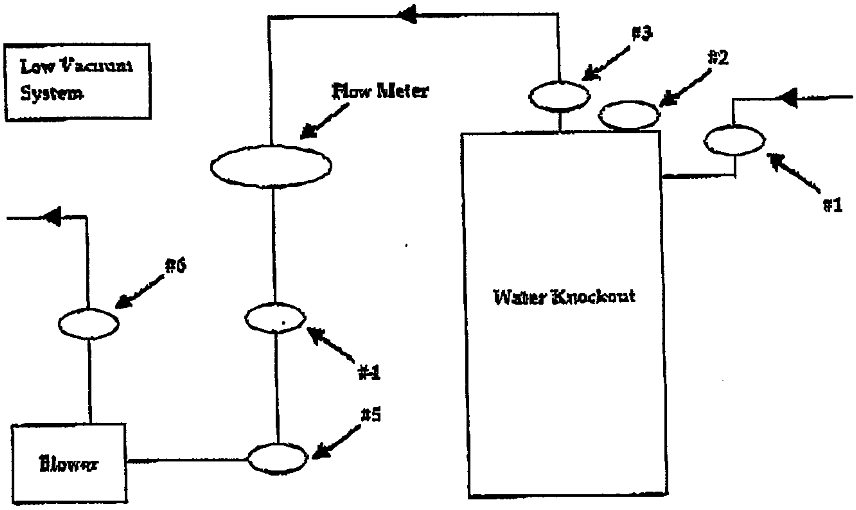
High Vac Blower Room **Fan** ON [✓ OFF]

Building Dampers OPEN [✓ CLOSED]

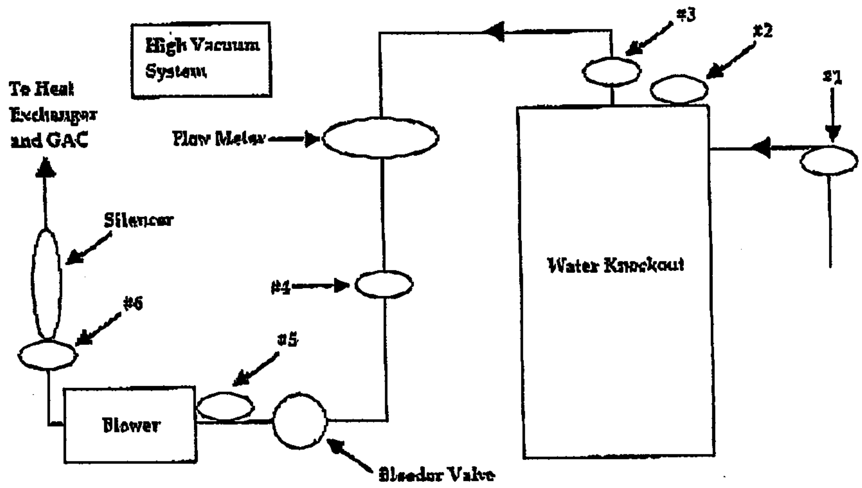
Building Thermostat Set Point 70 °F

OHM AS/SVE System
System Checklist

Date: 1/4/2010

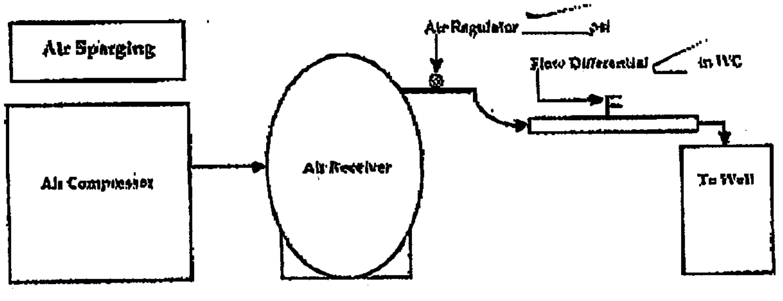


Sampling Point	+/- Inches WC/Hg
#1	- WC
#2	- Hg
#3	- WC
#4	- WC
#5	- WC
#6	+ WC



Sampling Point	+/- Inches WC/Hg
#1	-22.9 WC
#2	-2.2 Hg
#3	-21.1 WC
#4	-21.8 WC
#5	-23.6 WC
#6	+118.1 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



OHM AS/SVE System
System Checklist

Date: 1/4/10

Maintenance Activities

Air Compressor #1 Oil Level: ~~OK~~ **Quantity Added:** – QT
Air Compressor #2 Oil Level: ~~OK~~ **Quantity Added:** – QT
High-Vac Blower Oil Level: ~~OK~~ **Quantity Added:** – QT

Repairs Made, Additional Comments and Notes

Weekly Inspection Report

To: Marc Schlebusch, CDM
From: Herb Scott
Re: Weekly OHM Source Area Air Sparging/Soil Vapor Extraction Inspection Report, January 4, 2010 to March 3, 2010.
Date: March 15, 2010

Introduction

On March 3, 2010 Herb Scott of HydroGeoLogic Inc., (HGL) conducted the weekly site visit. Routine maintenance items and or non-routine maintenance items were completed on the air sparging/soil vapor extraction system located on the corner of 23rd Street (Highway 30) and 25th Avenue in Columbus, Nebraska, and noted on the attached March 3, 2010 system checklist.

The High Vacuum system was started and shut down during this time period. See Non-Routine Maintenance items for details.

The air sparging/soil vapor extraction system was configured upon arrival and departure as follows:

Air Sparging/Soil Vapor Extraction System Equipment	Status Arrival	Status Departure
Air Compressor No. 1	Off	Off
Air Compressor No. 2	Off	Off
Low Vacuum System Blower No. 1	Off	Off
Low Vacuum System Blower No. 2	Off	Off
Low Vacuum System Water Transfer Pump	Off	Off
High Vacuum System Blower	Off	Auto
High Vacuum System Heat Exchanger	Off	Auto
High Vacuum Water Transfer Pump	Off	Auto
Ventilation System Equipment		
Ventilation Fan No. 1 (Air Compressor No. 1)	Off	Off
Ventilation Fan No. 2 (Air Compressor No. 2)	Off	Off
Ventilation Fan No. 3 (High Vacuum Heat Exchanger)	Off	Off
Ventilation Fan No. 4 (High Vacuum Blower)	Off	Off
Building Dampers	Closed	Closed
Building Thermostat	70°F	70°F

Routine Maintenance

- The system operating configuration was documented.
- System panel hours were documented.
- The low vacuum system temperature, pressure, and flow volume data were not documented because the low vacuum system is offline. The system is offline to prevent excessive amounts of water from being processed through the system caused by running the vacuum system during a time of high groundwater levels at the site.
- The high vacuum system temperature, pressure, and flow volume data was documented upon system start up.

Non-routine Maintenance

Herb Scott went up to 10th street site Wednesday 1/13/10 to check on the system since there were frozen lines that I thawed before startup the week before. When I arrived I found that the High Vac GAC tank was leaking a fine carbon dust out of the manhole on top of the filter. The system was running so there is no way of telling how long this leak was occurring.
Everything on the west end of the building is covered by the dust and then it tapers off the farther east in the building you get. Herb vacuumed the floor the best he could but a major cleanup needs to take place. Everything needs moved and cleaned. The dust was an estimated 1/2" thick on top of the GAC tank that was leaking.

Herb opened up the tank and it is appoximately 2/3rds full of carbon. Herb took apart the 6" effluent line from the GAC tank and found it to be clear. Herb Doesn't know why there would be enough pressure on the effluent side of the GAC to blow dust out the manhole. Herb put the manhole back on and made sure that it was very secure.

After changing the oil in the High Vacuum blower and greasing the motor Herb started the system again. The pressure on the inlet side of the GAC was 4.9 lb.and the effluent side was 0.0 lb. The blower belts started squeaking due to the pressure in the GAC so I shut the system down and tightened the belts. A few minutes after restarting the system the inlet pressure to the GAC dropped to 4.0 lb (I don't know why). The manhole remained sealed and the system operated just fine.

Maintenance items that were performed on the High Vacuum system during the visit are:

Tightened belts on blower (We need new belts. Durapower 5VX - 800. Matched set of 4)
Changed blower oil
Greased motor
Cleaned all sand out of the knockout tank
Cleaned knockout pump screen
Vacuumed most of the floor
Inspected 6" Effluent line from the GAC.
Inspected liquid GAC tank lines to make sure they were fully functional.

On 1/15/2010 Herb Scott received notification that there was fine black dust coming out of the roof vent. When I got up to Columbus OHM I found that it had blown off in the building again also. Herb shut the system off.

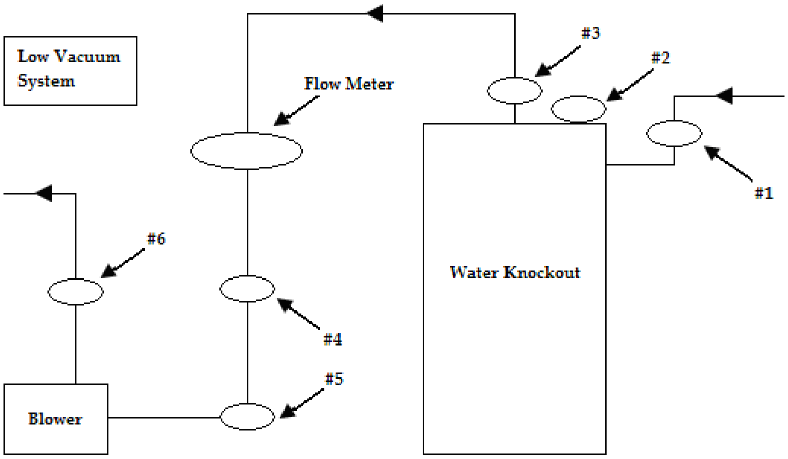
On 3/3/2010 Herb Scott performed the following maintenance items.
Turned off Electric heater.
Cleaned more of the facitlity.
Re-piped the High Vacuum system to exit through the middle Low Vacuum system GAC.
Started High Vacuum system.

New System Problems or Newly Discovered Items Needing Repair

- None.

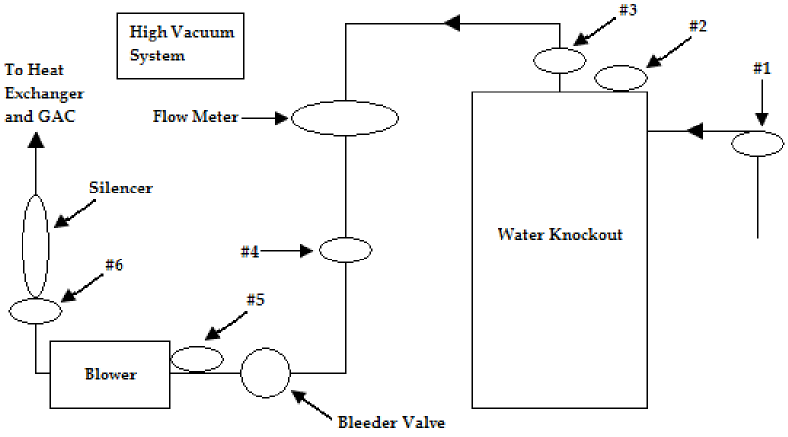
Other Activities

- None.



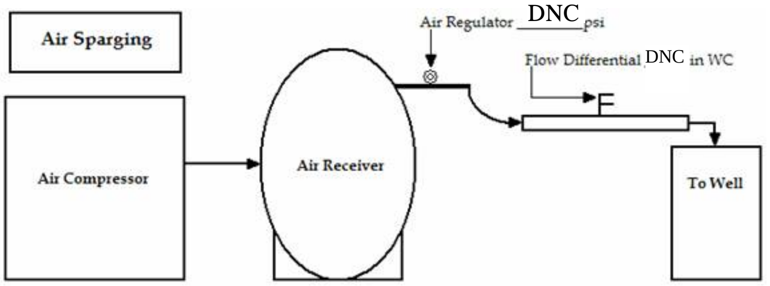
Sampling Point	+/- Inches WC/Hg
#1	DNC
#2	DNC
#3	DNC
#4	DNC
#5	DNC
#6	DNC

DNC = Did not collect. The low vacuum system is off line to prevent excessive amounts of water being processed through the system because of high groundwater levels at the site.



Sampling Point	+/- Inches WC/Hg
#1	- 31.9WC
#2	-3.9 hg
#3	-31.4 WC
#4	-33.4 WC
#5	-34.3 WC
#6	+42.2 WC

#1 - Pre-Knockout Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knockout Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Air Regulator DNC psi

Flow Differential DNC in WC

System Operating Hours and Gallons Water Treated

System operating hours and volume of water pumped and treated from the liquid knockout tanks for the reporting period are summarized below.

Equipment	Starting Date	Ending Date	Starting Hours	Ending Hours	Operation Hours this Period
Air Compressor No. 1	1/04/2010	3/3/2010	13133.5	13134.4	0.9
Air Compressor No. 2	1/04/2010	3/3/2010	13682.2	13682.2	0.0
Low Vacuum Blower No. 1	1/04/2010	3/3/2010	1885.9	1885.9	0.0
Low Vacuum Blower No. 2	1/04/2010	3/3/2010	4953.6	4953.6	0.0
High Vacuum Blower	1/04/2010	3/3/2010	28225.7	28490.8	265.1

Equipment	Starting Date	Ending Date	Starting Totalized Volume	Ending Totalized Volume	Volume this Period
			Gallons		
Liquid Knockout Treatment System	1/04/2010	3/3/2010	15081.1	Missed reading	0.0

Attachments

Weekly System Checklist

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: 3/3/10

System Operator: Herb Scott
Weather: warm
Temperature: Outside (°F): 45 **Inside (°F):** 62
System Operating Upon Arrival: YES [✓ NO]
If "No," what is the nature of the alarm? System shut down due to GAC problems.

ART Well

Air Pressure Gauge 1 (Sparge Line): — psi
Air Pressure Gauge 2 (Sparge Line): — psi
Air Flow (Sparge Line): — scfm
Water Pressure (Recirc. Line): — psi
Water Flow Rate (Recirc. Line): — gpm
CVE Vacuum: — in WC
Packer Pressure: — psi

Comments/Observations:

System Operating Configuration

Compressor #1	Hand	Off	[✓ Auto]
Compressor #2	Hand	[✓ Off]	Auto
Low-Vac Blower #1	Hand	[✓ Off]	Auto
Low-Vac Blower #2	Hand	[✓ Off]	Auto
Low-Vac Transfer Pump	Hand	[✓ Off]	Auto
High-Vac Blower	Hand	Off	[✓ Auto]
Heat Exchanger	Hand	Off	[✓ Auto]
High-Vac Transfer Pump	Hand	Off	[✓ Auto]

System Panel Hours

Compressor #1:	13134.4 hrs
Compressor #2:	17682.2 hrs
Low-Vac Blower #1:	1885.9 hrs
Low-Vac Blower #2:	4993.6 hrs
High-Vac Blower:	28490.8 hrs
Totalized Liquid Flow:	Missed reading gallons

Air Sparging System

Date:

	Compressor #1	*Compressor #2*
Air Pressure:	— psi	— psi
Percent Capacity:	— %	— %
Output Air Temperature:	— °F	— °F

	Status		
Air Dryer #1 Running/Tested:	OK	OFF	
Air Filter #1 Tested:	OK	Differential Pressure:	— psi
Air Filter #2 Tested:	OK	Differential Pressure:	— psi
Air Filter #3 Tested:	OK	Differential Pressure:	— psi

Date: 3/3/10

Low-Vac System Data

Low-Vac System Vacuum at Knock-Out Tank: — inches of Hg
Low-Vac System Vacuum before Knock-Out Tank: — inches of water
Low-Vac Air Flow: — fpm — inches of water
Low-Vac Effluent Total at GAC Tank: — inches of water
Low-Vac Effluent PID Data:
Inlet: — ppm
Outlet: — ppm

Heat Exchanger

High-Vac Influent Temperature: 90 °F
High-Vac Effluent Temperature: 64 °F
High-Vac Differential Pressure: 8.8 inches of water

High-Vac System

High-Vac at Knock-out Tank: 3.5 inches of Hg
High-Vac Blower Input Vacuum: 0.5 inches of water
High-Vac Air Flow: 4500 fpm 1.25 inches of water
High-Vac Blower Exhaust Pressure at GAC Tank: 1.0 psi
High-Vac Blower Exhaust Temperature at Heat Exchanger Influent: 90 °F
High-Vac Exhaust Pressure at Heat Exchanger: 40.5 inches of water

High-Vac GAC Tank Data

High-Vac Effluent Input C1: 1.0 psi — ppm
High-Vac Effluent Midpoint C2: ______ psi ______ ppm
High-Vac Effluent Midpoint C3: ______ psi ______ ppm
High-Vac Effluent Outlet: — psi — ppm

Ventilation System Data

Air Compressor #1 Fan ON [✓ OFF]
Air Gates OPEN CLOSED

Air Compressor #2 Fan ON [✓ OFF]
Air Gates OPEN CLOSED

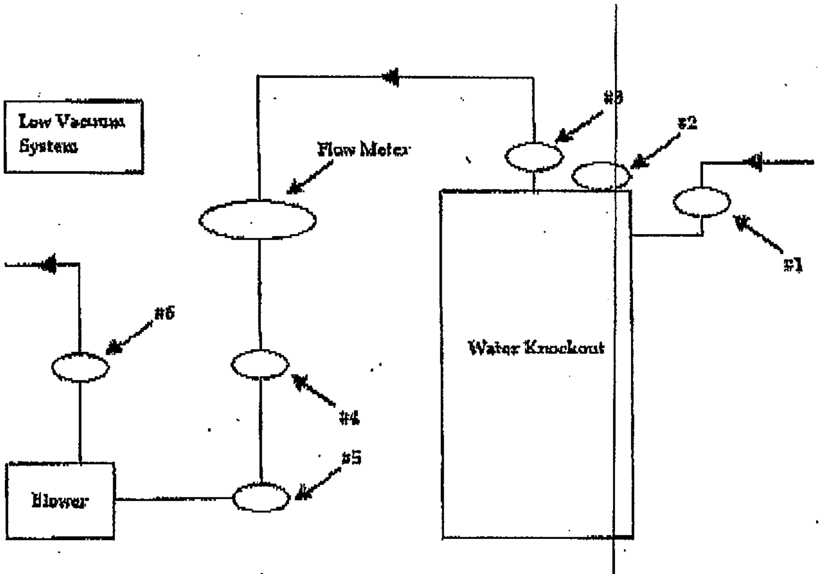
Heat Exchanger Fan ON [✓ OFF]

High Vac Blower Room Fan ON [✓ OFF]

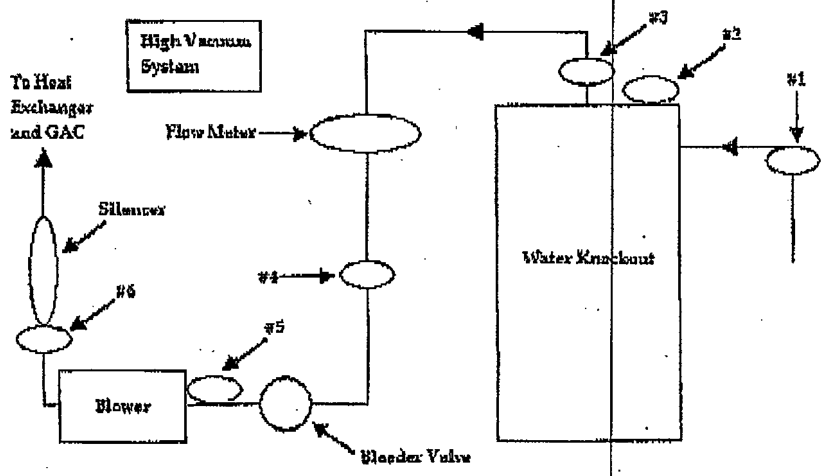
Building Dampers OPEN [✓ CLOSED]

Building Thermostat Set Point 80 °F

Date: 3/7/10

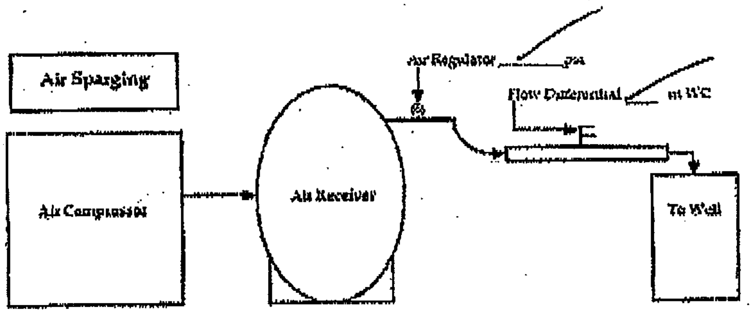


Sampling Point	+/- Inches WC/Hg
#1	- WC
#2	- Hg
#3	- WC
#4	- WC
#5	- WC
#6	+ WC



Sampling Point	+/- Inches WC/Hg
#1	-31.9 WC
#2	-7.9 Hg
#3	-31.4 WC
#4	-27.4 WC
#5	-34.5 WC
#6	+42.2 WC

#1 - Pre-Knock-Out Tank Pete's Plug®
#2 - Vacuum Gauge
#3 - Post-Knock-Out Tank Pete's Plug®
#4 - Post-Flow Meter Pete's Plug®
#5 - Pre-Blower
#6 - Post-Blower



Date: 3/3/10

Maintenance Activities

Air Compressor #1 Oil Level: OK **Quantity Added:** — QT
Air Compressor #2 Oil Level: OK **Quantity Added:** — QT
High-Vac Blower Oil Level: OK **Quantity Added:** — QT

Repairs Made, Additional Comments and Notes

Turned off heater
Cleaned Facility
Put High Vac Effluent through low Vac GAC.
Started High Vac System

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____

Weekly Data Collection **Monthly Well Inspection** (circle one)

Clay Vapor Extraction System Field Measurements

Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
CVE-1			
CVE-2			
CVE-3			
CVE-4			
CVE-5			
CVE-6			
CVE-7			
CVE-8			
CVE-9			
CVE-10			
CVE-11			
CVE-12			
CVE-13			
CVE-14			
CVE-15			
CVE-16			
CVE-17			
CVE-18			
CVE-19			
CVE-20			
CVE-21			
CVE-22			
CVE-23			
CVE-24			
CVE-25			
CVE-26			
CVE-27			
CVE-28			
CVE-29			
CVE-30			
CVE-31			
CVE-32			
CVE-33			
CVE-34			
CVE-35			
CVE-36			
CVE-37			
CVE-38			
CVE-39			
CVE-40			
CVE-41			
CVE-42			
CVE-43			
CVE-44			
CVE-45			
CVE-46			
CVE-47			
PCIX-2D			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Soil Vapor Extraction System Field Measurements

Well	Valve (O/C/P)	Vacuum (in Hg)	Comments
SVE-1			
SVE-2			
SVE-3			
SVE-4			
SVE-5			
SVE-6			
SVE-7			
SVE-8			
SVE-9			
CIX-2			

System Checklist
One Hour Martinizing AS/SVE System
Columbus, Nebraska

Date: ____________________

System Operator: ____

Weekly Data Collection **Monthly Well Inspection** *(circle one)*

Air Sparging Field Measurements

Well	Valve (O/C/P)	Pressure (psi)	Comments
AS-1			
AS-2			
AS-3			
AS-4			
AS-5			
AS-6			
AS-7			
AS-8			
AS-9			
AS-10			
AS-11			
AS-12			
AS-13			
AS-14			
AS-15			
AS-16			
AS-17			
AS-18			
AS-19			
AS-20			
AS-21			
AS-22			
AS-23			
PCIX-1A			
PCIX-2A			
PCIX-5A			