

BLUE SAGE ENVIRONMENTAL, INC.
Environmental Project Management

February 22, 2022

Kyle Parker, Ecology – TCP
Central Regional Office
1250 West Alder Street
Union Gap, WA 98903-0009

RE: Curt Heikell Property, VCP Project No.: CE0350
Cleanup Work Plan Summary

Dear Mr. Parker:

The Red Bridge Road property, located at 5130 Red Bridge Road, Cle Elum, has multiple areas that may require remediation and/or additional characterization (**Figure 1**). These areas are identified in the figure as follows:

Stained Area #1:

Petroleum hydrocarbon contaminated soil was removed from stained area #1 in 2011 (**Photo 1**) by Able Cleanup Technologies, Inc. (ACT). Soil samples SAO-1, SAO-1A, and SAO-1B were collected (**Figure 2**) at 2 feet below ground surface (bgs). SAO-1A and SAO-1B were analyzed for diesel range organics (DRO) by method NWTPH-Dx and carcinogenic polycyclic aromatic hydrocarbons (cPAH) by method 8270. No concentrations of diesel/lube oil were detected above their MTCA Method A cleanup levels (CUL). Sample SAO-1B detected an elevated concentration of cPAH (0.018 mg/kg) above the CUL. No groundwater was present in the shallow excavation.

Stained Area #2:

Petroleum hydrocarbon contaminated soil was removed from stained area #2 in 2011 by ACT (**Photo 1**). A single soil sample, CH-SAO-5, was collected from the excavated area at a depth of 3 feet bgs (**Figure 2**). No groundwater was present in the shallow excavation. This sample was analyzed for petroleum hydrocarbons by method TPH-HCID. Lube oil range organics were detected at 7,000 mg/kg. BSE resampled this area on 7/18/2017. The soil sample (AREA 2-EXC @3 ft bgs) was analyzed for DRO by method NWTPH-Dx. Diesel and lube oil range organics were not detected above laboratory reporting limits.

4,000 Gallon Diesel Storage Tank:

A 4,000-gallon above-ground storage tank (AST) system that formerly contained diesel fuel was decommissioned by ACT in October 2011 (**Photo 2**). The AST was connected to a dispenser pump that was located approximately 15 feet north of the tank by steel piping. Details of the

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decommissioning operation were reported to Ecology in a site assessment report (ACT 2011). This report identified the diesel storage tank as an underground storage tank (UST). BSE does not concur with this definition as the storage tank was sitting on the ground. For purposes of this work plan summary, the tank will be identified as an AST.

Following removal of the AST system (tank, piping, and dispenser), petroleum contaminated soil was noted around the dispenser. Remediation of contaminated soil by excavation was done by ACT (**Photo3**). Soil samples were collected from the sidewalls and floor of the excavation (**Figure 3**). Depth at the floor of the excavation was approximately 11.5 feet bgs. Elevated concentrations above CUL for diesel were detected in sidewall soil samples CH-SAD-10 (3,200 mg/kg @ 8ft bgs) and CH-SAD-12 (680 mg/kg @8ft bgs). Floor soil samples CH-SAD-8 (10.5 ft bgs) and CH-SAD-9 (11.5 ft bgs) did not detect diesel/lube oil concentrations above laboratory reporting limits. BSE collected sidewall samples UST East and UST West in 2017 from approximately the same locations as ACT sidewall samples CH-SAD-10 and CH-SAD-12 that were collected in 2011. Concentrations of diesel/lube oil were below laboratory reporting limits.

Groundwater seeped into the open excavation at a depth below 10 feet bgs. No groundwater samples have been collected by either ACT or BSE. Characterization of groundwater will need to be completed around the excavated area where the AST system was formerly located.

Stained Area #3:

Adjacent to state route SR-970 at the south end of property next to an old barn is a concrete silo pad (**Figure 4**). Petroleum hydrocarbon-stained soil was identified in this area by ACT in 2011. Excavation of contaminated soil was completed across the area to a depth of approximately 3ft bgs. Soil samples collected by ACT following the excavation detected elevated concentrations of lube oil range organics above CUL in samples SAO-3A (5,210 mg/kg) and SAO-3B (16,400 mg/kg). In 2017, BSE collected additional soil samples from this area. Concentrations of lube oil range organics were detected above CUL, but lower than the 2011 concentrations.

Remedial Cleanup Actions:

A summary of soil sample analytical results from 2011 (ACT) and 2017 (BSE) can be reviewed in the attached table. It should be noted that the sample numbers listed in the table follow the chain of custody as submitted by ACT to their lab. They do not match the ACT figures exactly as multiple sample locations do not use the CH to reference the samples.

Based on the soil sample analytical results, there are two separate courses of action to be completed. The first phase would be the excavation of identified hot spots. The second phase would be the characterization of groundwater where the AST was formerly located.

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Additional removal of potentially contaminated soil will be done in stained area #1 next to the building (reference soil sample CH-SAO-1B, elevated cPAH). This area will be resampled following this cleanup action.

Stained area #2 has a small footprint where ACT removed petroleum hydrocarbon stained soil in 2011. ACT collected a soil sample from this area. However, they used method TPH-HCID to analyze the sample for petroleum hydrocarbon organics. BSE collected a soil sample from the middle of this excavated area in 2017. This soil sample (Area 2 – EXC) was analyzed for diesel/lube range organics by method NWTPH-Dx. DRO was not detected above CUL. BSE recommends that this area has been sufficiently characterized and requires no further remediation.

Stained area #3 has detected elevated concentrations of DRO in soil. This entire area will require additional excavation and sampling to address the remediation and characterization of the release.

The AST system contained diesel fuel that was used for farm equipment. The floor of the excavation (CH-SAD-8 @10.5ft, and CH-SAD-9 @11.5 ft) did not detect diesel range organics above the laboratory detection limit. However, side wall samples (CH-SAD-10 and CH-SAD-12 @8ft bgs) detected elevated levels of diesel above the CUL. BSE resampled both sidewalls (UST-East and UST-West @8ft bgs) in 2017. The samples were analyzed for DRO by method NWTPH-Dx. Concentrations of diesel/lube oil range petroleum hydrocarbons were not detected above laboratory reporting limits. No additional excavation of soils is planned for this area.

Following remedial cleanup actions to removal of additional soils from the stained areas, soil samples will be collected to assess the cleanup objective of reaching MTCA Method A soil cleanup levels. BSE recommends the following analytical methods be used for soil characterization:

Contaminant	Analytical Method
Diesel Range Petroleum Hydrocarbons	NWTPH-Dx
Gasoline/BTEX	NWTPH-Gx/ EPA 8260D
cPAH	EPA 8270E
MTCA 5 Metals (arsenic, cadmium, chromium, lead, mercury)	EPA 6010D and 7471B

The second phase of the cleanup remediation will be to characterize groundwater around the former AST system. This will be accomplished by using a direct push rig to advance a minimum of three borings around the excavation. Soil and groundwater samples will be collected from each boring. The borings will be completed as monitoring wells in case the grab samples

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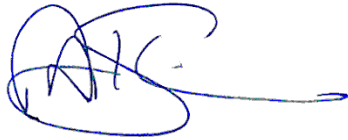
indicate further groundwater monitoring is required. BSE recommends the following analytical methods be used for groundwater characterization:

Contaminant	Analytical Method
Diesel Range Petroleum Hydrocarbons	NWTPH-Dx

Currently, winter weather conditions preclude moving ahead with any site work. An approximate time frame of beginning the next phase of remediation work will be April 2022.

If you have any questions, please do not hesitate to contact me.

Sincerely,
Blue Sage Environmental, Inc.



Alexander H. Koch, Project Manager

cc: Curt Heikell
Glenn Hayman, LHG, Hayman Environmental

REFERENCES

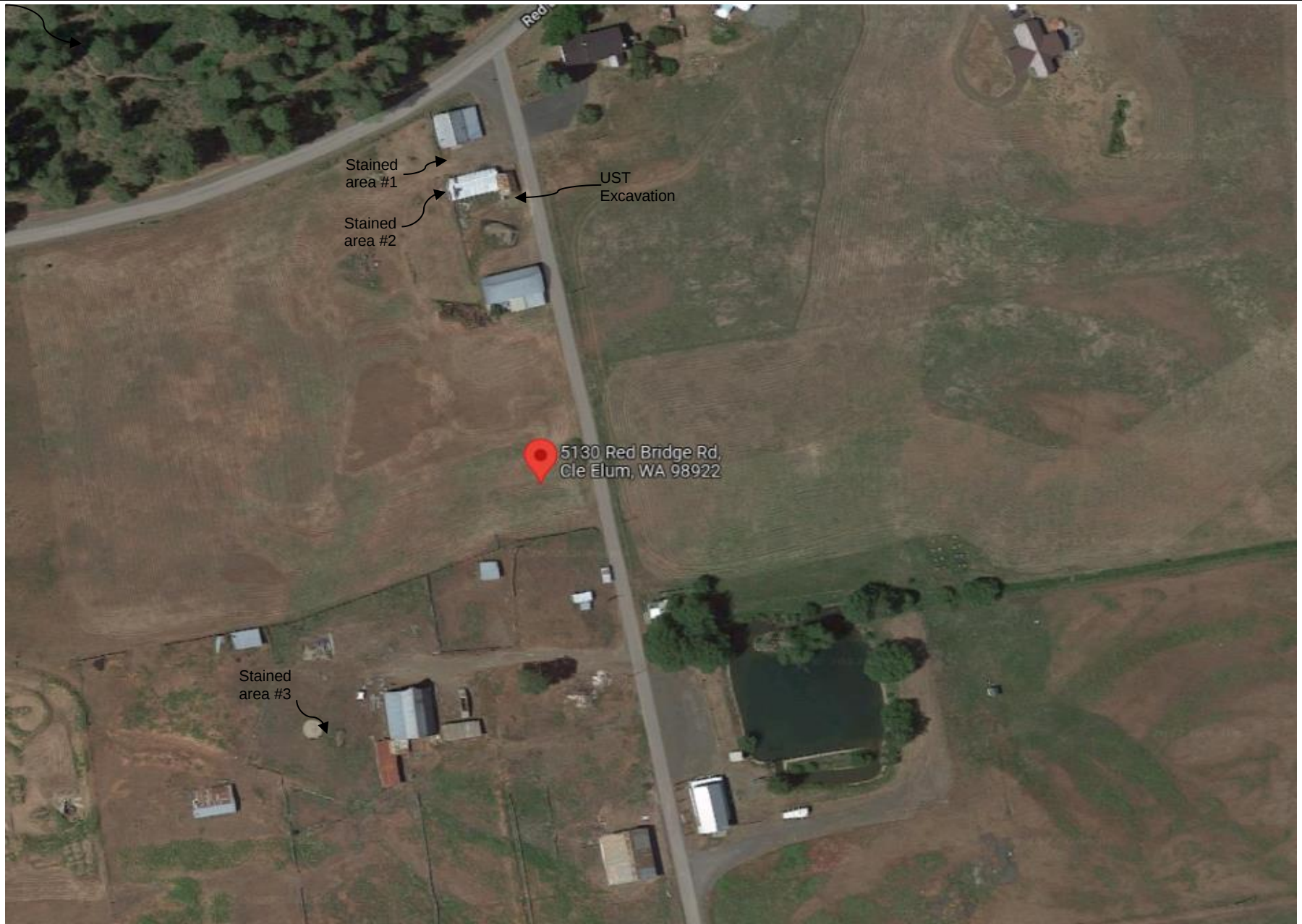
Washington Department of Ecology, Toxics Cleanup Program, *Guidance for Remediation of Petroleum Contaminated Soils*, Publication No. 10-09-057, Revised June 2016, Olympia, Washington.

Washington Department of Ecology, Toxics Cleanup Program, *Model Toxics Control Act Cleanup Regulation, Chapter 173-340 WAC*, Publication No. 94-06, Revised 2013, Olympia, Washington.

Able Clean-up Technologies, Inc., November 20, 2011, *Underground Storage Tank Closure Site Assessment & Remediation Report for Curt Heikell*, Consultant's Report to Client, Spokane, Washington.

FIGURES

Curt Heikell Property
5130 Red Bridge Road
Cle Elum, Washington

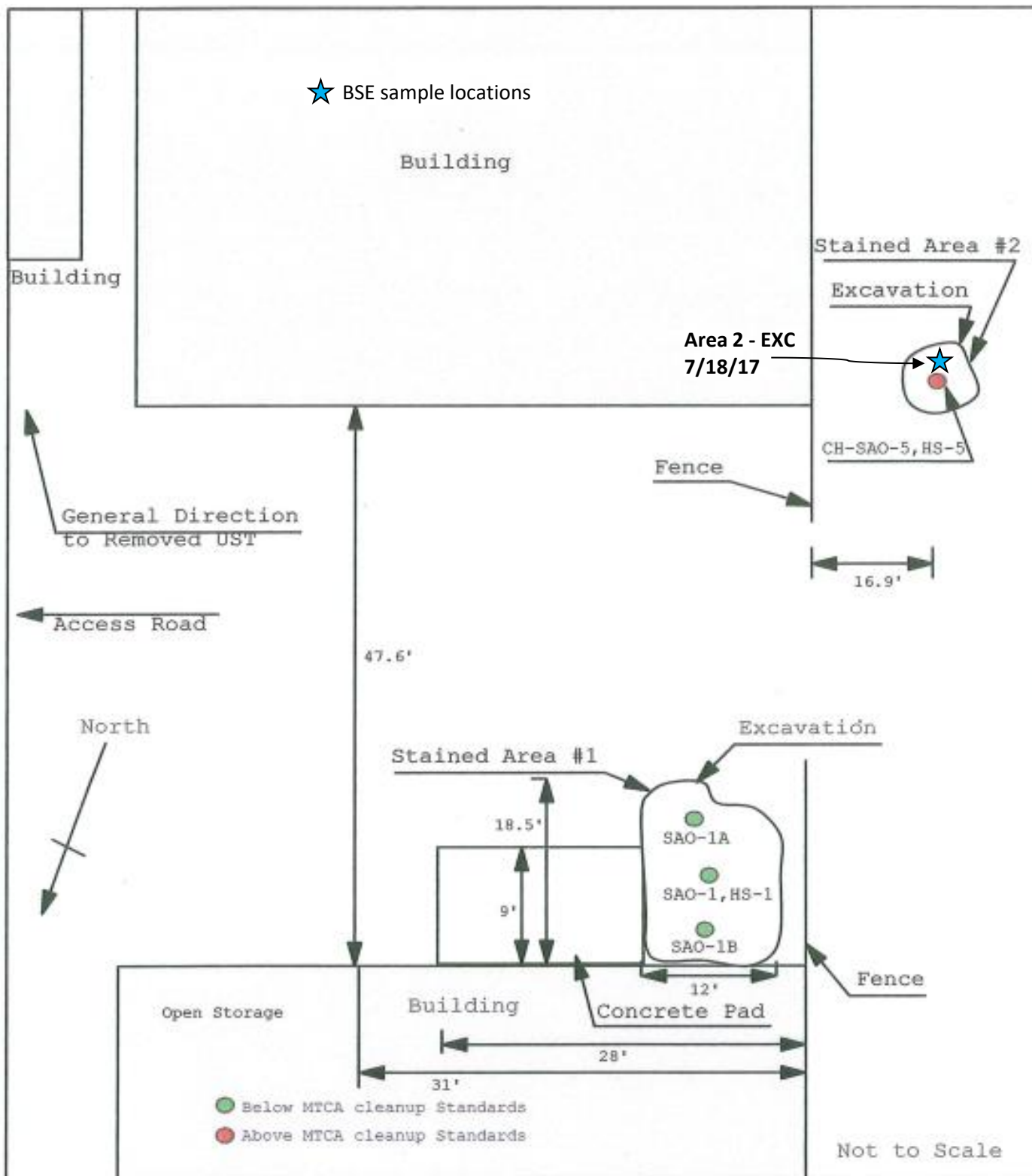


**BLUE SAGE
ENVIRONMENTAL, INC.
KENNEWICK, WA**

TITLE Curt Heikell Property
Cle Elum, WA
Areas with Petroleum Hydrocarbon Spills

SCALE: Google Aerial
DWN: A. KOCH
DATE: 2/15/2022

DWG. NO.
Figure 1



Title: Curt Heikell
5130 Red Bridge Road
Cle Elum, Washington

SAMPLE LOCATIONS

ABLE CLEAN-UP-TECHNOLOGIES, INC.

SITE MAP: Sampling Site Map
Stained Areas 1 & 2

Drawn By: KES

Date: 12/5/11

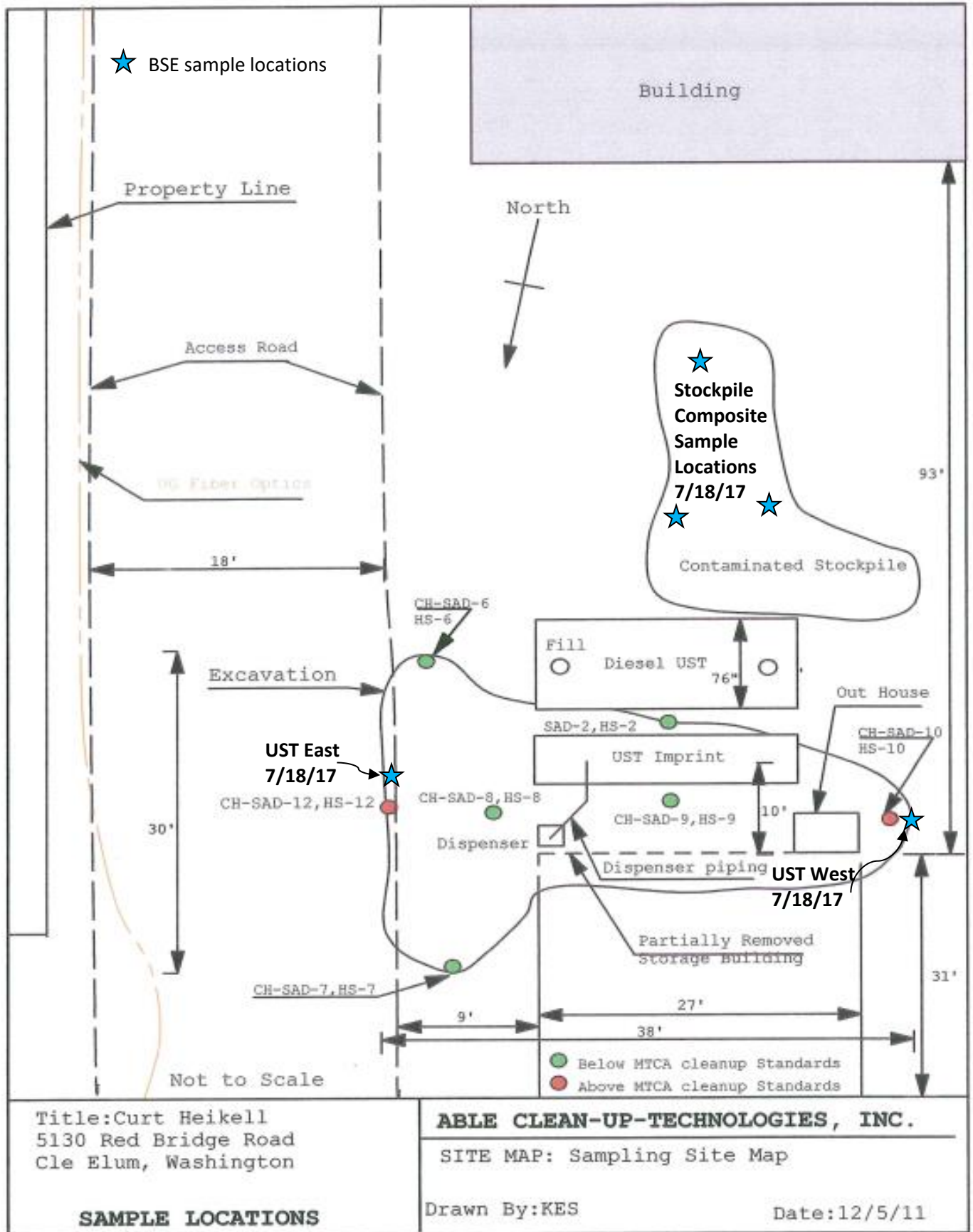
**BLUE SAGE
ENVIRONMENTAL, INC.
KENNEWICK, WA**

TITLE: Curt Heikell Property
Cle Elum, WA
Areas 1 & 2

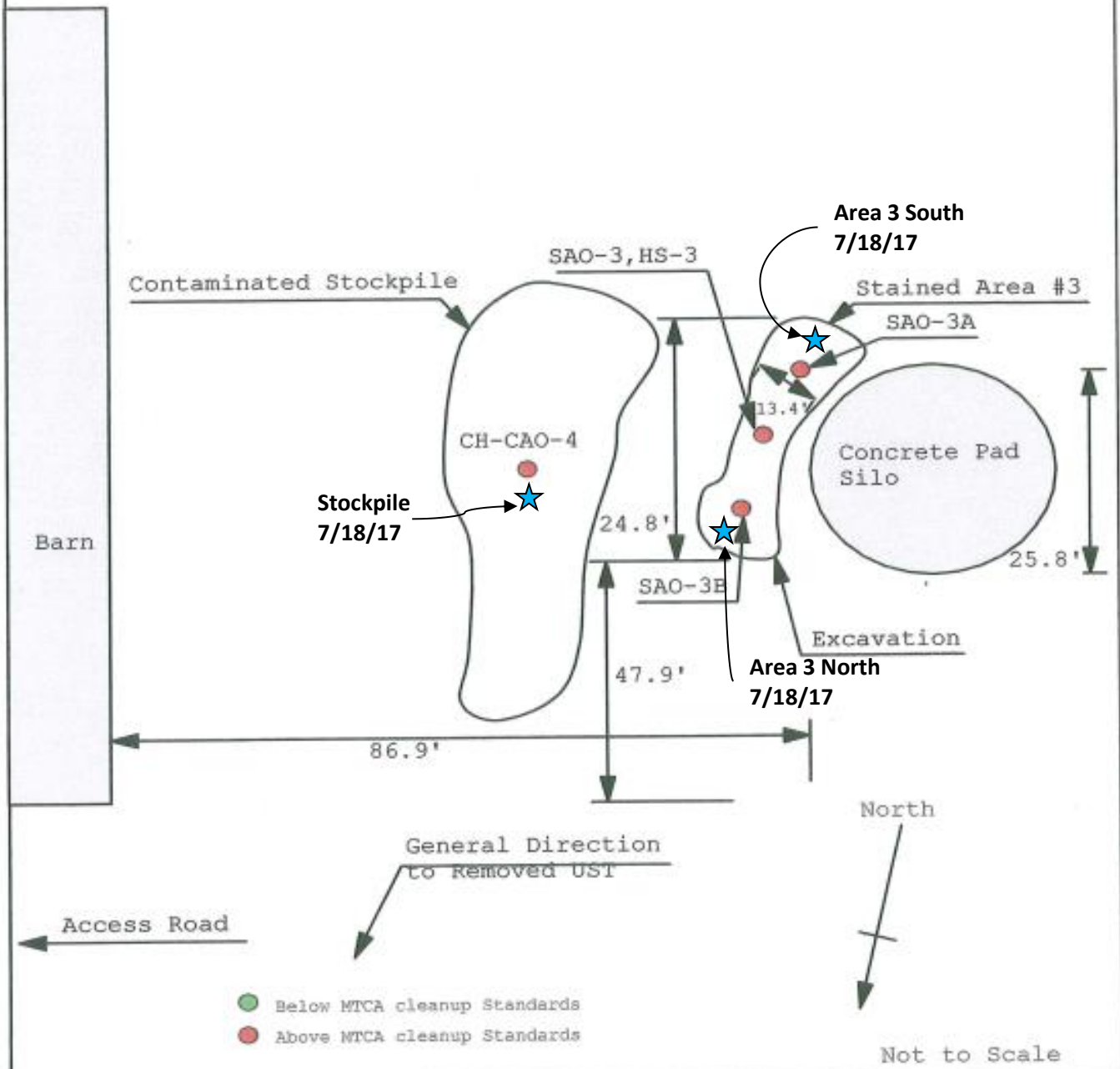
SCALE: as shown
DWN: Able
DATE: 12/5/11

DWG NO.

Figure 2



★ BSE sample locations



Title: Curt Heikell
5130 Red Bridge Road
Cle Elum, Washington

SAMPLE LOCATIONS

ABLE CLEAN-UP-TECHNOLOGIES, INC.

SITE MAP: Sampling Site Map
Stained Area 3

Drawn By: KES

Date: 12/5/11

**BLUE SAGE
ENVIRONMENTAL, INC.
KENNEWICK, WA**

TITLE: Curt Heikell Property
Cle Elum, WA
Sample Locations Area 3

SCALE: as shown
DWN: Able
DATE: 12/5/11

DWG NO.

Figure 4

TABLES

Curt Heikell Property
5130 Red Bridge Road
Cle Elum, Washington

Table 1 Soil Sample Analytical Results
Curt Heikell Property
5130 Red Bridge Road
Cle Elum, Washington

Blue Sage Environmental, Inc.
Kennewick, WA

Sample ID Number	Sample Date	Location	Sample Depth (ft)	Consultant	Diesel	Heavy Oil	Gasoline	Benzene	Toluene	Ethyl-benzene	Xylenes	cPAH* (total)	PCB**	Arsenic	Cadmium	Chromium (Cr III)	Lead	Mercury
units: mg/kg MTCA Method A Cleanup Level					2,000	2,000	30/100	0.03	7	6	9	0.1	0.1	20	2	2000	250	2
Stained Area #1																		
SAO-1	10/20/2011	Excavation	2	ACT	<50	600	<25	-	-	-	-	-	-	-	-	-	-	-
CH-SAO-1A	10/20/2011	Excavation	2	ACT	<25	<100	-	-	-	-	-	<0.05	-	-	-	-	-	-
CH-SAO-1B	10/20/2011	Excavation	2	ACT	46.5	561	-	-	-	-	-	0.18	-	-	-	-	-	-
Stained Area #2																		
CH-SAO-5	10/20/2011	Excavation	3	ACT	<50	7,000	<25	-	-	-	-	-	-	-	-	-	-	-
Area 2 - EXC	7/18/2017	Excavation	3	BSE	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-
UST Area																		
SAD-2	10/20/2011	Excavation	3	ACT	466	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-6	10/21/2011	Excavation	7.5	ACT	<25	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-7	10/21/2011	Excavation	7	ACT	<25	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-8	10/21/2011	Excavation	10.5	ACT	<25	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-9	10/21/2011	Excavation	11.5	ACT	<25	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-10	10/21/2011	Excavation	8	ACT	3,200	-	-	<0.025	<0.025	<0.025	<0.025	-	-	-	-	-	-	-
CH-SAD-12	10/21/2011	Excavation	8	ACT	2,680	-	-	<0.025	<0.025	0.325	0.582	-	-	-	-	-	-	-
UST-East	7/18/2017	Excavation	8	BSE	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-
UST West	7/18/2017	Excavation	8	BSE	<50	<100	-	-	-	-	-	-	-	-	-	-	-	-
UST-SP	7/18/2017	Stockpile	2	BSE	<50	7,400	-	-	-	-	-	-	-	-	-	-	-	-
Stained Area #3																		
SAO-3	10/20/2011	Excavation	3	ACT	<50	100	<25	-	-	-	-	-	-	-	-	-	-	-
CH-SAO-3A	10/20/2011	Excavation	3	ACT	<250	5,210	-	-	-	-	-	<0.05	-	-	-	-	-	-
CH-SAO-3B	10/20/2011	Excavation	3	ACT	<250	16,400	-	-	-	-	-	0.33	-	-	-	-	-	-
CH-SAO-4	10/20/2011	Stockpile	1	ACT	-	-	-	-	-	-	-	-	<0.1	<0.05	<0.05	<0.05	<0.05	<0.01
Area 3 - North	7/18/2017	Excavation	3	BSE	<50	4,800	-	-	-	-	-	-	-	-	-	-	-	-
Area 3 - South	7/18/2017	Excavation	3	BSE	<50	5,000	-	-	-	-	-	-	-	-	-	-	-	-
Area 3 - SP	7/1811	Stockpile	2	BSE	-	17,000	-	-	-	-	-	-	-	-	-	-	-	-

Notes:

- * Method A Cleanup Level total concentration of carcenogenic PAHs
- ** Method A CUL total concentration of PCB
- 600 Method WATPH-HCID used for analysis
- Contaminant not analyzed
- 5.9 Bold number(s) indicate contaminant detected
- 3,200 Bold and red number(s) indicate concentration above MTCA Method A cleanup level

PHOTOGRAPHS

Curt Heikell Property
5130 Red Bridge Road
Cle Elum, Washington



This picture shows the excavation at stained area #1. This picture was collected looking in a northwesterly direction.



This picture shows the excavation at stained area #2. This picture was collected looking in a northeasterly direction.

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KENNEWICK, WA**

TITLE Red Bridge Road Site
 Stained Areas #1 & #2

SCALE: Google Aerial
DWN: A. KOCH
DATE: 2/17/2022

DWG. NO.
Photo 1



This picture shows the site when ACT first arrived & removed the dispenser. This picture was collected looking in a northeasterly direction.



This picture shows the inside of the cleaned UST.

**BLUE SAGE
ENVIRONMENTAL, INC.
KENNEWICK, WA**

TITLE Red Bridge Road Site
4,000 Gal. AST Diesel Tank

SCALE: Google Aerial
DWN: A. KOCH
DATE: 2/17/2022

DWG. NO.
Photo 2



This picture shows the continued removal of the contaminated soils from around the dispenser. This picture was collected looking in a westerly direction.



This picture shows the finished excavation the tan soils at the bottom of the excavation are not contaminated. This picture was collected looking in a northerly direction.

**BLUE SAGE
ENVIRONMENTAL, INC.
KENNEWICK, WA**

TITLE Red Bridge Road Site
Dispenser Area Excavation

SCALE: Google Aerial
DWN: A. KOCH
DATE: 2/17/2022

DWG. NO.
Photo 3