

Air Case ID: 13222 Permit Id: 899

FIN No.: A0557

Company Name: US ECOLOGY NEVADA, INC.

HA Basin No: 230

Increment Tracked ☐

Permit No:

AP49530184.05

Select a Permit No

Date App. Received:

09/23/2026



*

Permit Writer:

Not Assigned (NA) ▼

*

Case Type:

Class 2 Revision w/o Public Notice ▼

*

Default ODS Date:

10/07/2026



*

Actual ODS Date:



Date App. to be Closed:

12/06/2026



*

Stop Days:

Actual Date App. to be Closed:

12/6/2026

App. Incomplete?

☐

Date App. Closed:



Fee Paid (\$):

2500

*

Case Description:

Comments:

Flag (For Class 4) :

None ▼

*

Update

Cancel

RECEIVED

SEP 23 2026

BAPC/BAQP

September 3, 2026

Project # 18-01-106

Nevada Division of Environmental Protection
Bureau of Air Pollution Control
Class II Permitting Branch
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249

RECEIVED

SEP 23 2026

ENVIRONMENTAL PROTECTION

**RE: US Ecology Nevada, Inc. – Facility ID No. A0557, Permit No. AP4953-0184
Class II Air Quality Operating Permit Revision Application**

Broadbent & Associates, Inc. (Broadbent) is pleased to present the attached Nevada Division of Environmental Protection, Bureau of Air Pollution Control (NDEP-BAPC) Class II Air Quality Operating Permit (AQOP) Revision Application. US Ecology Nevada, Inc. is currently permitted with NDEP-BAPC as Facility ID No. A0557, and Permit No. AP4953-0184.

US Ecology Nevada, Inc. is requesting the following proposed minor revision:

- 1) Systems 26a and 26b - Tank Farm Acid/Base Neutralization System: The facility is requesting to include VOC emissions from the process. A more detailed description of the proposed revision is provided in the application attachment: Process Narrative - Description of Proposed Permit Revisions.

US Ecology Nevada, Inc. and Broadbent would appreciate the opportunity to review a draft copy of the permit prior to issuance. Should you have any questions or concerns regarding this submittal, please feel free to contact me at (702) 563-0600 or smcnulty@broadbentinc.com.

Sincerely,
Broadbent & Associates, Inc.



Carol Adams
Senior Scientist

Reviewed and Approved by:



Scott McNulty
Air Quality Division Manager

Attachment: Class II Air Quality Operating Permit Revision Application

cc: Pierre-luc Juteau, PJuteau@republicservices.com

ATTACHMENT: Class II Air Quality Operating Permit Revision Application

Class II Air Quality Operating Permit Application Form

Facility Name: US Ecology Nevada, Inc.

Existing Facility ID: A0557

Existing Class II AQOP: AP4953-0184

Type of Facility: Hazardous waste treatment and disposal

Number of Units (including IA's) in Facility: 54

If a Revision, Number of Units (including IA's) Affected in Action: 4

Application Type:

- ☐ New AQOP
☒ Revision of Existing AQOP
☐ Renewal of Existing AQOP



Please Submit Application to:

Nevada Division of Environmental Protection
Bureau of Air Pollution Control, Class II Permitting Branch
901 South Stewart Street, Suite 4001
Carson City, Nevada 89701-5249
Phone (775) 687-9349

September 2024
(Ver. 6)

IMPORTANT INFORMATION

- The Application packet contains:
 - General Company Information Form
 - Industrial Process Form
 - Combustion Equipment Form
 - Storage Silo Form
 - Liquid Storage Tanks Form
 - Insignificant Activities Form
 - Facility-Wide Potential to Emit Table
 - Surface Area Disturbance Form
 - Plant Boundary Coordinates Form
 - Plant Building Parameters Form
 - Application Certification Document with Required Attachments
- Please see the Guidance Document for additional instructions on how to complete the application.
- A printed copy of the application must be submitted (mailed or hand delivered), along with an electronic version.
- The application filing fee required by Nevada Administrative Code (NAC) 445B.327 must be submitted with the completed application. Checks must be made payable to the "Nevada State Treasurer, Environmental Protection" with "BAPC" noted in the memo line. Fees may also be submitted electronically at <https://epayments.ndep.nv.gov/>.
- This application shall be used for new Class II sources, revisions to existing Class II Air Quality Operating Permits, and the renewal of Class II Air Quality Operating Permits. This application packet is not for use for an Administrative Renewal, Administrative Amendment, a general permit, a stand-alone Surface Area Disturbance (SAD) permit, nor for a Request for Change of Location Approval permit for a temporary source.
- An application for a Class II Air Quality Operating Permit must be signed by the Responsible Official, as defined in NAC 445B.156. The certification/signature page is the last page of the application and the original "wet" signature must be provided.
- All items in the application must be addressed. If an item does not apply "N/A" or similar notation must be entered in the appropriate blank. All other information must be provided. Incomplete applications will be returned to the Responsible Official within 10 working days of receipt of the application.
- For the renewal of a Class II Operating Permit, a complete application and corresponding processing fee must be submitted in accordance with NAC 445B.3473, prior to the expiration date of the current permit. The BAPC suggests that the application be submitted well in advance of the timeline outlined in NAC 445B.3473 to ensure the application is deemed complete.
- If the facility applies for a permit that has not previously held a Class I or Class II operating permit, is located within 1,000 feet of a school, hospital, or residential area, or the Director determines that the change to the stationary source results in an increase in allowable emissions that exceeds the thresholds in NAC 445B.3457, the BAPC shall establish a 30-day period for public participation.

GENERAL COMPANY INFORMATION FORM

1. Briefly describe the permitted facility's process and include the Standard Industrial Classification (SIC) number and North American Industry Classification System (NAICS). Add details in the attached Process Narrative.

SIC 4953; NAICS 562211. Hazardous waste treatment and disposal

2. Company Name and Address that are to appear on the operating permit [NAC 445B.295(1)]:

Name: US Ecology Nevada

Address: P.O. Box 578

City: Beatty

State: Nevada

Zip Code: 89003

3. Owner's Name and Address [NAC 445B.295(1)]:

Name: US Ecology Holdings, Inc.

Address: 101 South Capital Boulevard

City: Boise

State: Idaho

Zip Code: 83702

4. Facility Name and Address, if different from #2 [NAC 445B.295(1)]:

Name: N/A

Address:

City:

State:

Zip Code:

5. If records are required under the operating permit will be kept at a location other than the facility, specify that location [NAC 445B.295(7)]:

Name: N/A

Address:

City:

State:

Zip Code:

GENERAL COMPANY INFORMATION FORM (continued)

6. Responsible Official Name, Title and Mailing Address [NAC 445B.295(1)]:

Name: Pierre-luc Juteau
Title: General Manager
Address: PO Box 578
City: Beatty
State: Nevada Zip Code: 89003
Phone Number: 800 -239 -3943
Fax Number: 775 -553 -2942
E-mail Address: PJuteau@republicservices.com

Is this a new Responsible Official? ☐ Yes ☒ No

If yes, and the Responsible Official (RO) does not meet the definition under NAC 445B.156 then please fill out the "Responsible Official Identification/Designation/Change Request Form" and mail it in.

(<https://ndep.nv.gov/air/permitting/download-permit-forms>)

7. Plant Manager or other appropriate Contact Name, Title and Address [NAC 445B.295(1)]:

Name: Shane Bookhout ONeill
Title: Environmental Compliance Manager
Address: P.O. Box 578
City: Beatty
State: Nevada Zip Code: 89003
Phone Number: (800) 239-3943
Fax Number: (775) 553-2942
E-mail Address: SONeill@republicservices.com

8. Location and Driving Directions to the Facility (For Example: From Elko, Nevada, 4 miles south of I-80 at xx Interchange) [NAC 445B.295(8)]:

Hydrographic Basin (HA) Number: 230
HA Basin Name: Armargosa Desert

Township(s): 13S N; Range(s): 47 E; Section(s): 26, 35

UTM Coordinates for the Front Gate of the Facility (NAD 83, Zone 11):

4,069,346 m North; 528,224 m East;

Nearest City: Beatty

County: Nye

Driving Directions from nearest city to the Facility: From Beatty, drive south on
US 95 approximately 11 miles. Facility is on the right.

GENERAL COMPANY INFORMATION FORM (continued)

9. **Emission Cap Requested [NAC 445B.070 and NAC 445B.296(2)]:**
☐ Yes ☒ No (If yes, provide details in the attached Process Narrative)
10. **Important note** for completing the Industrial Process, Combustion Equipment, Storage Silo, and Liquid Storage Tank Application forms: forms need to be included for permitted emission units and insignificant activities. Provide additional forms as needed. All items in the application must be addressed. If an item does not apply then "N/A" or similar notation must be entered in the appropriate blank (TBD, unknown, etc.).
11. **Is the Facility located within 1,000 feet of a school, hospital, or residential area?**
☐ Yes ☒ No
12. **Does the Facility require controls or other limit restrictions to remain a Class II source?**
☐ Yes ☒ No
13. **Has the facility provided modeling for each non-combustion baghouse individually? (See Testing Determination System for Baghouses Guidance Document)**
☒ Yes ☐ No

INDUSTRIAL PROCESS APPLICATION FORM CLASS II OPERATING PERMIT

System Number and Name: **System 26 – Tank Farm Acid/Base Neutralization System**

Emission Unit Description: **Acid Neutralization Reactor Tank T-1**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☐ Yes ☒ No If yes, identify in attached Process Narrative.

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001, PF1.001	S2.041
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	5-03-007-01
	Manufacturer		Belding Tank Technologies
	Date Manufactured		03/2024
	Model Number		C-FDV-12-17110
	Equipment Dimensions (LxWxH)	feet	26.6 H x 12 D
	Drop Length if applicable	feet	N/A
	Drop Height if applicable	feet	N/A
	The drop height is measured from the ☐ top of the drop length ☐ middle of the drop length ☐ bottom of the drop length, in reference to the ground. Choose one, if applicable		
	Drop Horizontal Dimension 1 if applicable	feet	N/A
	Drop Horizontal Dimension 2 if applicable	feet	N/A
	Emissions Released Inside building?		yes/no
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	4,069,093 (Waste Scrubber)
	UTM Easting (NAD 83, Zone 11)	m	528,055 (Waste Scrubber)
Operating Parameters	Material Type Processed		Acid & Waste Caustic Solution
	Batch Process if applicable	unit /batch	gallon
	Start Time if operating less than 24 hours/day	hour:minute	12:00 am
	End Time if operating less than 24 hours/day	hour:minute	12:00 am
Control Equipment	Manufacturer		HEE-Duall
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	10.1
	Stack Inside Diameter	feet	1.6
	Stack Temperature	°F	< 120
	Stack Exit Velocity	feet/second	8.6
	Actual Gas Volume Flow Rate	acfm	1,900
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	N/A
	Stack Release Type		☒ vertical ☐ capped ☐ horizontal

1. How will throughput be monitored for this emission unit? Identify if the throughput will be monitored at this emission unit or at another emission unit and the method (e.g. weigh belt).

Records of number of containers and container size

INDUSTRIAL PROCESS APPLICATION FORM CLASS II OPERATING PERMIT

System Number and Name: **System 26 – Tank Farm Acid/Base Neutralization System**

Emission Unit Description: **Acid Neutralization Reactor Tank T-2**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☐ Yes ☒ No If yes, identify in attached Process Narrative.

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001, PF1.001	S2.042
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	5-03-007-01
	Manufacturer		Belding Tank Technologies
	Date Manufactured		03/2024
	Model Number		C-FDV-12-17110
	Equipment Dimensions (LxWxH)	feet	26.6 H x 12 D
	Drop Length if applicable	feet	N/A
	Drop Height if applicable	feet	N/A
	The drop height is measured from the ☐ top of the drop length ☐ middle of the drop length ☐ bottom of the drop length, in reference to the ground. Choose one, if applicable		
	Drop Horizontal Dimension 1 if applicable	feet	N/A
	Drop Horizontal Dimension 2 if applicable	feet	N/A
Emissions Released Inside building?		yes/no	No
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	4,069,093 (Waste Scrubber)
	UTM Easting (NAD 83, Zone 11)	m	528,055 (Waste Scrubber)
Operating Parameters	Material Type Processed		Acid & Waste Caustic Solution
	Batch Process if applicable	unit / batch	gallon
	Start Time if operating less than 24 hours/day	hour:minute	12:00 am
	End Time if operating less than 24 hours/day	hour:minute	12:00 am
Control Equipment	Manufacturer		HEE-Duall
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	10.1
	Stack Inside Diameter	feet	1.6
	Stack Temperature	°F	< 120
	Stack Exit Velocity	feet/second	8.6
	Actual Gas Volume Flow Rate	acfm	1,900
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	N/A
	Stack Release Type		☒ vertical ☐ capped ☐ horizontal

1. How will throughput be monitored for this emission unit? Identify if the throughput will be monitored at this emission unit or at another emission unit and the method (e.g. weigh belt).

Records of number of containers and container size

INDUSTRIAL PROCESS APPLICATION FORM CLASS II OPERATING PERMIT

System Number and Name: System 26 – Tank Farm Acid/Base Neutralization System

Emission Unit Description: Acid Storage Tank T-3

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☐ Yes ☒ No If yes, identify in attached Process Narrative. _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001, PF1.001	S2.043
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	5-03-007-01
	Manufacturer		Belding Tank Technologies
	Date Manufactured		03/2024
	Model Number		C-FDV-10-8200
	Equipment Dimensions (LxWxH)	feet	20.8 H x 10 D
	Drop Length if applicable	feet	N/A
	Drop Height if applicable	feet	N/A
	The drop height is measured from the ☐ top of the drop length ☐ middle of the drop length ☐ bottom of the drop length, in reference to the ground. Choose one, if applicable		
	Drop Horizontal Dimension 1 if applicable	feet	N/A
	Drop Horizontal Dimension 2 if applicable	feet	N/A
Emissions Released Inside building?	yes/no	No	
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	4,069,089 (Acid Scrubber)
	UTM Easting (NAD 83, Zone 11)	m	528,055 (Acid Scrubber)
Operating Parameters	Material Type Processed		Acid Solution
	Batch Process if applicable	unit / batch	gallons
	Start Time if operating less than 24 hours/day	hour:minute	12:00 am
	End Time if operating less than 24 hours/day	hour:minute	12:00 am
Control Equipment	Manufacturer		HEE-Duall
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	10.1
	Stack Inside Diameter	feet	1.25
	Stack Temperature	°F	< 120
	Stack Exit Velocity	feet/second	8.4
	Actual Gas Volume Flow Rate	acfm	1,100
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	N/A
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

1. How will throughput be monitored for this emission unit? Identify if the throughput will be monitored at this emission unit or at another emission unit and the method (e.g. weigh belt).

Records of number of containers and container size

INDUSTRIAL PROCESS APPLICATION FORM CLASS II OPERATING PERMIT

System Number and Name: **System 26 – Tank Farm Acid/Base Neutralization System**

Emission Unit Description: **Acid Storage Tank T-4**

Alternative Operating Scenario: ☐ Yes ☒ No

Insignificant Activity: ☐ Yes ☒ No If yes, identify exemption regulation: _____

Subject to a Federal Regulation (40 CFR Part 60, 61, or 63): ☐ Yes ☒ No If yes, identify in attached Process Narrative. _____

Description			Data
Equipment Description	BAPC Emission Unit ID Applicable for Renewal or Revision	eg. Unit ID: S2.001, PF1.001	S2.044
	Source Classification Code (SCC)	e.g. 3-03-024-04 for Conveyors	5-03-007-01
	Manufacturer	Belding Tank Technologies	
	Date Manufactured	03/2024	
	Model Number	C-FDV-10-8200	
	Equipment Dimensions (LxWxH)	feet	20.8 H x 10 D
	Drop Length if applicable	feet	N/A
	Drop Height if applicable	feet	N/A
	The drop height is measured from the ☐ top of the drop length ☐ middle of the drop length ☐ bottom of the drop length, in reference to the ground. Choose one, if applicable		
	Drop Horizontal Dimension 1 if applicable	feet	N/A
	Drop Horizontal Dimension 2 if applicable	feet	N/A
Emissions Released Inside building?	yes/no	No	
Location of Emission Source	UTM Northing (NAD 83, Zone 11)	m	4,069,089 (Acid Scrubber)
	UTM Easting (NAD 83, Zone 11)	m	528,055 (Acid Scrubber)
Operating Parameters	Material Type Processed	Acid Solution	
	Batch Process if applicable	unit / batch	gallons
	Start Time if operating less than 24 hours/day	hour:minute	12:00 am
	End Time if operating less than 24 hours/day	hour:minute	12:00 am
Control Equipment	Manufacturer	HEE-Duall	
	Manufacturer's Guarantee Included? If "yes", attach manufacturer's sheets immediately after these forms.	yes/N/A	Yes
Stack Parameters	Stack Height	feet	10.1
	Stack Inside Diameter	feet	1.25
	Stack Temperature	°F	< 120
	Stack Exit Velocity	feet/second	8.4
	Actual Gas Volume Flow Rate	acfm	1,100
	Dry Gas Volume Flow Rate If not included in detailed calculations.	dscfm	N/A
	Stack Release Type	☒ vertical ☐ capped ☐ horizontal	

1. How will throughput be monitored for this emission unit? Identify if the throughput will be monitored at this emission unit or at another emission unit and the method (e.g. weigh belt).

Records of number of containers and container size

INDUSTRIAL PROCESS AND STORAGE SILO DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Throughput		Controls			Emissions					Reference
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 01 - Screen Loading														
PF1.001	Material loading to grizzly hopper	24	8760	200	1,752,000	tons	water sprays	75%	PM	0.003	lb/ton	0.15	0.66	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0011	lb/ton	0.055	0.24	
									PM _{2.5}	0.00017	lb/ton	0.0085	0.037	
PF1.002	Grizzly hopper discharge to conveyor	24	8760	200	1,752,000	tons	water sprays	75%	PM	0.003	lb/ton	0.15	0.66	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0011	lb/ton	0.055	0.24	
									PM _{2.5}	0.00017	lb/ton	0.0085	0.037	
System 02 - Screen														
PF1.003	Screen and associated transfers	24	8760	200	1,752,000	tons	water sprays	75%	PM	0.025	lb/ton	1.25	5.48	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0087	lb/ton	0.44	1.91	
									PM _{2.5}	0.0013	lb/ton	0.065	0.29	
System 03 - Screen Stockpiles														
PF1.004	Oversize conveyor discharge to stockpile	24	8760	200	1,752,000	tons	water sprays	75%	PM	0.003	lb/ton	0.15	0.66	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0011	lb/ton	0.055	0.24	
									PM _{2.5}	0.00017	lb/ton	0.0085	0.037	
PF1.005	Intermediate conveyor discharge to stockpile	24	8760	See Reference			water sprays	75%	PM					Hourly and yearly throughput for PF1.004, PF1.005, and PF1.006, combined.
									PM ₁₀					
									PM _{2.5}					
PF1.006	Fines conveyor discharge to stockpile	24	8760	See Reference			water sprays	75%	PM					Hourly and yearly throughput for PF1.004, PF1.005, and PF1.006, combined.
									PM ₁₀					
									PM _{2.5}					

INDUSTRIAL PROCESS AND STORAGE SILO DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Throughput		Controls			Emissions					Reference
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 13 - Hazardous Waste Stabilization Unit														
PF1.010	Hazardous Waste Stabilization Unit (Pan #2 and Pan #3)	24	8760	75	657,000	tons	prewetting, manual watering	n/a	PM	0.0048	lb/ton	0.36	1.58	AP 42, Table 11.19.2.2, tertiary crushing (uncontrolled) (EF used in 2010 renewal application with BAPC concurrence)
									PM ₁₀	0.0028	lb/ton	0.21	0.92	
									PM _{2.5}	0.0004	lb/ton	0.030	0.14	
System 15 - Mixing Tank #4 & #5														
S2.019	Mixing Tank #4	24	8,760	110	963,600	tons	Baghouse	44,707	PM	0.0021	gr/dscf	0.81	3.56	July 2015 source test with safety factor = 2. Emissions = 0.007 gr/dscf x 44,707 dscf/min x 60 min/hr / 7000 gr/lb
									PM ₁₀	0.0017	gr/dscf	0.65	2.85	
									PM _{2.5}	0.0017	gr/dscf	0.65	2.85	
S2.021	Mixing Tank #5	24	8,760	110	963,600	tons	Baghouse	n/a	PM					Emissions included in S2.019
									PM ₁₀					
									PM _{2.5}					
S2.028	Loader or Truck discharge to Mixing Tank #4	24	8,760	20	175,200	tons	Baghouse	n/a	PM					Emissions included in S2.019
									PM ₁₀					
									PM _{2.5}					
S2.029	Loader or Truck discharge to Mixing Tank #5	24	8,760	20	175,200	tons	Baghouse	n/a	PM					Emissions included in S2.019
									PM ₁₀					
									PM _{2.5}					
System 16 - Storage Silo #9 for Stabilization Reagent (e.g. quicklime, portland cement), 162 tons														
S2.022	Storage silo #9, loading	24	8,760	40	5,000	tons	Bin vent	n/a	PM	0.0089	lb/ton	0.36	0.022	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0049	lb/ton	0.20	0.012	
									PM _{2.5}	0.0007	lb/ton	0.028	0.0018	
PF1.011	Storage silo #9, unloading	24	8,760	40	5,000	tons	n/a	n/a	PM	0.0048	lb/ton	0.19	0.012	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0028	lb/ton	0.11	0.0070	
									PM _{2.5}	0.0004	lb/ton	0.016	0.0010	

INDUSTRIAL PROCESS AND STORAGE SILO DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Throughput		Controls			Emissions					Reference
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 17 - Storage Silo #8 for Stabilization Reagent (e.g. quicklime, portland cement), 162 tons														
S2.023	Storage silo #8, loading	24	8,760	50	5,000	tons	Bin vent	n/a	PM	0.0089	lb/ton	0.45	0.022	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0049	lb/ton	0.25	0.012	
									PM _{2.5}	0.0007	lb/ton	0.035	0.0018	
PF1.012	Storage silo #8, unloading	24	8,760	50	5,000	tons	n/a	n/a	PM	0.0048	lb/ton	0.24	0.012	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0028	lb/ton	0.14	0.0070	
									PM _{2.5}	0.0004	lb/ton	0.020	0.0010	
System 22 - Storage Silo #10 for Stabilization Reagent (e.g. quicklime, portland cement), 162 tons														
S2.030	Storage silo #10, loading	24	8,760	50	5,000	tons	Bin vent	n/a	PM	0.0089	lb/ton	0.45	0.022	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0049	lb/ton	0.25	0.012	
									PM _{2.5}	0.0007	lb/ton	0.035	0.0018	
PF1.013	Storage silo #10, unloading	24	8,760	50	5,000	tons	n/a	n/a	PM	0.0048	lb/ton	0.24	0.012	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0028	lb/ton	0.14	0.0070	
									PM _{2.5}	0.0004	lb/ton	0.020	0.0010	
System 23 - Storage Silo #11 for Stabilization Reagent (e.g. quicklime, portland cement), 162 tons														
S2.031	Storage silo #11, loading	24	8,760	50	5,000	tons	Bin vent	n/a	PM	0.0089	lb/ton	0.45	0.022	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0049	lb/ton	0.25	0.012	
									PM _{2.5}	0.0007	lb/ton	0.035	0.0018	
PF1.014	Storage silo #11, unloading	24	8,760	50	5,000	tons	n/a	n/a	PM	0.0048	lb/ton	0.24	0.012	Guidance on Emission Factors for the Mining Industry, May 31, 2017
									PM ₁₀	0.0028	lb/ton	0.14	0.0070	
									PM _{2.5}	0.0004	lb/ton	0.020	0.0010	

INDUSTRIAL PROCESS AND STORAGE SILO DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Throughput		Units	Controls		Emissions					Reference	
		Daily	Annual	Hourly	Annual		Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)		
System 24 - Mixing Tanks #6, #7, and #8 (STAB2)															
S2.032	Loader or Truck discharge to Mixing Tank #6	24	8,760	20	175,200	tons	2 Separate Baghouses control all emission units in STAB2 Building	n/a	PM						Emissions included in S2.030
									PM ₁₀						
									PM _{2.5}						
S2.033	Mixing Tank #6	24	8,760	110	963,600	tons		25,000	PM	0.01	gr/dscf	2.14	9.39	Baghouse manufacturer TBD. Refer to Equipment Specification attachment. Emissions = 0.01 gr/dscf x 25,000 dscf/min x 60 min/hr / 7000 gr/lb	
									PM ₁₀	0.01	gr/dscf	2.14	9.39		
									PM _{2.5}	0.01	gr/dscf	2.14	9.39		
S2.034	Loader or Truck discharge to Mixing Tank #7	24	8,760	20	175,200	tons		n/a	PM						Emissions included in S2.030 & S2.033
									PM ₁₀						
									PM _{2.5}						
S2.035	Mixing Tank #7	24	8,760	110	963,600	tons		n/a	PM						Emissions included in S2.030 & S2.033
									PM ₁₀						
									PM _{2.5}						
S2.036	Shredder and discharge to Mixing Tank #8	24	8,760	50	438,000	tons		n/a	PM						Emissions included in S2.033
									PM ₁₀						
									PM _{2.5}						
S2.037	Loader or Truck discharge to Mixing Tank #8	24	8,760	20	175,200	tons		n/a	PM						Emissions included in S2.033
									PM ₁₀						
									PM _{2.5}						
S2.038	Mixing Tank #8	24	8,760	110	963,600	tons		25,000	PM	0.01	gr/dscf	2.14	9.39	Baghouse manufacturer TBD. Refer to Equipment Specification attachment. Emissions = 0.01 gr/dscf x 25,000 dscf/min x 60 min/hr / 7000 gr/lb	
									PM ₁₀	0.01	gr/dscf	2.14	9.39		
									PM _{2.5}	0.01	gr/dscf	2.14	9.39		

INDUSTRIAL PROCESS AND STORAGE SILO DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Throughput		Controls			Emissions					Reference
		Daily	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
Insignificant Activities														
IA1.020	Cooling Tower CT-1	24	8,760	10,800	94,608,000	gallons	Drift	0.001%	PM			0.003	0.012	IA1.020 & IA1.021 - Cooling Tower Emissions Calculations Worksheet
									PM ₁₀			0.003	0.012	
									PM _{2.5}			0.003	0.012	
IA1.021	Cooling Tower CT-2	24	8,760	10,800	94,608,000	gallons	Drift	0.001%	PM			0.003	0.012	IA1.020 & IA1.021 - Cooling Tower Emissions Calculations Worksheet
									PM ₁₀			0.003	0.012	
									PM _{2.5}			0.003	0.012	

COMBUSTION EQUIPMENT DETAILED CALCULATIONS

Unit No.	Unit	Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Power Output		Controls		Emissions					Reference
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Amount	Units	Type	Dry Volume Flow Rate (dscfm)	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 14 Primary - Soil Vapor Extraction Well (located near Trench 10)																			
S2-015	Soil vapor extraction wells through which vadose zone gases are removed using one or more pumps	24	8,760	0.80	7,008	8.60	75,355	gal	N/A	hp	Thermal Oxidizer System	230	PM	0.8	lb/10 ³ gal	6.88E-03	0.030	AP 42, Section 1.5, Table 1.5-1, Butane Emission Factors	
													PM ₁₀	0.8	lb/10 ³ gal	6.88E-03	0.030		
													PM _{2.5}	0.8	lb/10 ³ gal	6.88E-03	0.030		
													SO ₂	0.054	lb/10 ³ gal	0.10	0.44	AP 42, Section 1.5, Table 1.5-1, Propane EF SO ₂ = 0.01 % (estimate) Safety Factor = 20x	
													NO _x	125	ppm	0.21	0.90	Refer to Manufacturer	
													CO	100	ppm	0.10	0.44	Emissions Guarantee	
													VOC	15	ppm			Refer to System 14 - SVE Well Worksheet	
													Pb	n/a	n/a	n/a	n/a	n/a	
													Hg	n/a	n/a	n/a	n/a	n/a	
													H ₂ S	n/a	n/a	n/a	n/a	n/a	

GREENHOUSE GASES (GHG) DETAILED CALCULATIONS

Unit No.	Unit	Description	Operating Hours		Heat Input (MMBtu)		Fuel Usage			Controls		Emissions						Reference
			Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Type	Dry Volume Flow Rate (dscfm)	Pollutant	Factor	GWP Multiplier	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 14 - Soil Vapor Extraction Well (located near Trench 10)																		
52.015		Soil vapor extraction wells through which vadose zone gases are removed using one or more pumps	24	8,760	0.80	7,008	8.60	75,355	gal	Thermal Oxidizer System	230	CO ₂	14,300	1	lb/10 ³ gal	11,440	50,107	AP-42, Section 1.5, Table 1.5-1, Butane Emission Factors
												CH ₄	0.2	25	lb/10 ³ gal	4.0	17.5	
												N ₂ O	0.9	298	lb/10 ³ gal	215	940	

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Heat Input (lb/MMBtu)		Fuel Usage			Controls		Emissions					Reference
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 13 - Hazardous Waste Stabilization Unit																
P11.010	Hazardous Waste Stabilization Unit	24	8,760	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	0.11	0.49	RFI Response 9/9/2019
System 14 - Soil Vapor Extraction Well																
S2.015	Soil vapor extraction wells through which vadose zone gases are removed using one or more pumps	24	8,760	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	0.70	3.08	Refer to System 14 (S2.015) - SVE Well Worksheet
S2.015alt	Soil vapor extraction wells through which vadose zone gases are removed using one or more pumps	24	8,760	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	0.10	0.45	Refer to System 14 (S2.015alt) - SVE Well Worksheet
System 18 - Gasoline Storage Tanks																
S2.024	2,000 Gasoline Storage Tank	24	8760	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	N/A	N/A	TANKS 4.09d
System 19 - Aerosol Can Crusher																
S2.025	Aerosol Can Crusher	24	3,600	n/a	n/a	n/a	n/a	n/a	carbon filter	n/a	Totals HAPS	0.26	lb/hr	0.26	0.47	Refer to System 19 (S2.025) - Aerosol Can Crusher Systems Worksheet
System 21 - Aerosol Can Crusher																
S2.027	Liquid Gas Tank E-24, 779 gallons	24	3,600	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	0.090	0.16	Refer to System 21 (S2.027) - Liquid Gas Tank E-24 Worksheet
System 25a - Aerosol Can Crusher II																
S2.039	Compactor Purging Vent (CPU) & Local Exhaust Vent (LEV)	24	3,600	n/a	n/a	n/a	n/a	n/a	carbon filter	n/a	Totals HAPS	n/a	n/a	0.69	1.23	Refer to Systems 25a & 25b - Aerosol Can Crusher II Worksheet
System 25b - Aerosol Can Crusher II																
S2.040	Non-Condensables Vent (NCV)	24	3,600	n/a	n/a	n/a	n/a	n/a	carbon filter	n/a	Totals HAPS	n/a	n/a	0.183	0.329	Refer to Systems 25a & 25b - Aerosol Can Crusher II Worksheet

HAZARDOUS AIR POLLUTANTS (HAPS) DETAILED CALCULATIONS

Unit No.	Unit Description	Operating Hours		Heat Input (lb/MMBtu)		Fuel Usage			Controls		Emissions					Reference
		Daily	Annual	Hourly	Annual	Hourly	Annual	Units	Type	Efficiency or Dry Volume Flow Rate	Pollutant	Factor	Unit	Hourly Rate (lbs/hr)	Yearly Rate (tons/yr)	
System 26a -Tank Farm Acid/Base Neutralization System																
S2.041	Add Neutralization Reactor Tank T-1	24	8,760	n/a	n/a	n/a	n/a	n/a	Waste Caustic Scrubber	90%	Totals HAPS	n/a	n/a	0.147	0.65	Refer to System 26a & 26b - Tank Farm Acid Base Neutralization System Worksheet
S2.042	Add Neutralization Reactor Tank T-2	24	8,760	n/a	n/a	n/a	n/a	n/a								
System 26b -Tank Farm Acid/Base Neutralization System																
S2.043	Add Storage Tank T-3	24	8,760	n/a	n/a	n/a	n/a	n/a	Acid Scrubber	90%	Totals HAPS	n/a	n/a	0.147	0.65	Refer to System 26a & 26b - Tank Farm Acid Base Neutralization System Worksheet
S2.044	Add Storage Tank T-4	24	8,760	n/a	n/a	n/a	n/a	n/a								
Insignificant Activities																
IAS	Miscellaneous Tanks	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	Totals HAPS	n/a	n/a	0.44	1.94	Refer to VOC & HAP Emissions - Wazardous Waste Stabilization Unit & Tanks Worksheet

NOTE: RED indicates added or revised in this application.

FACILITY-WIDE POTENTIAL TO EMIT TABLE
(FOR ALL SOURCES INCLUDING INSIGNIFICANT ACTIVITIES)
(POUND/HOUR AND TON/YEAR)

Pollutant	Facility-Wide Potential to Emit (pound/hour)	Facility-Wide Potential to Emit (ton/year)
Total Particulate Matter (PM)	9.77	31.54
Total PM ₁₀	7.22	25.30
Total PM _{2.5}	5.28	22.23
Total Sulfur Dioxide (SO ₂)	0.10	0.44
Total Oxides of Nitrogen (NO _x)	0.21	0.90
Total Carbon Monoxide (CO)	0.10	0.44
Total Volatile Organic Compounds (VOC)	20.59	44.55
Total Lead (Pb)		
Total Hydrogen Sulfide (H ₂ S)		
Total Sulfuric Acid Mist (H ₂ SO ₄)		
Total Hazardous Air Pollutants (HAPs)	2.87	9.45
Total Greenhouse Gases (CO _{2e})	11,659	51,064
Other Regulated Pollutants (Specify)		

REVISION TABLE

Please complete the table below if this application is for a **Revision** of an existing Class II Air Quality Operating Permit. Add more columns if needed for any other applicable regulated pollutants. All Potential To Emit (PTE) must be in tons per year (TPY) [NAC 445B.3457(5)(b)]

Description	Pollutants									
	PM	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC	HAPs	CO _{2e}	Other
Permitted Facility-Wide PTE (TPY)	31.54	25.30	22.22	0.44	0.90	0.44	43.26	8.66	0.00	N/A
Proposed Facility-Wide PTE (TPY)	31.54	25.30	22.23	0.44	0.90	0.44	44.55	9.45	51,064	N/A
Change in Facility-Wide PTE (TPY)	0.00	0.00	0.01	0.00	0.00	0.00	1.29	0.79	51,064	N/A

NOTE: Permitted Facility -Wide PTE (tpy) emissions are from the Permit issued on July 9, 2025.

SURFACE AREA DISTURBANCE FORM

1. Total Acres of the Facility Site: 480
2. Total Acres Disturbed: 136 - includes all ground being disturbed, and all ground previously disturbed but not stabilized)
3. Add Surface Area Disturbance location as Township(s), Range(s) and Section
Township 13 South, Range 47 East, Section 35
4. NAC 445B.22037 requires fugitive dust to be controlled (regardless of the size or amount of acreage disturbed), and requires an ongoing program, using best practical methods, to prevent particulate matter from becoming airborne. All activities which have the potential to adversely affect the local air quality must implement all appropriate measures to limit controllable emissions. Appropriate measures for dust control may consist of a phased approach to acreage disturbance rather than disturbing the entire area all at once; using wet suppression through such application methods as water trucks or water spray systems to control wind-blown dust; the application of soil binding agents or chemical surfactant to roadways and areas of disturbed soil; as well as the use of wind-break or wind limiting fencing designed to limit wind erosion soils.
5. If the Surface Area Disturbance is greater than 5 acres, please check each box that applies for Best Management Practices (BMPs) used for controlling dust on project's disturbed areas:
 - ☒ Water trucks
 - ☒ Graveling/paving of roadway storage areas and staging areas
 - ☒ Dust palliatives
 - ☒ Posting and limiting vehicle speeds to 10-15 miles per hour
 - ☒ Ceasing operations during high wind events
 - ☒ Fencing or berming to prevent unauthorized access to disturbed areas
 - ☒ Application of water sprays on material storage piles on a regular basis
 - ☐ Covering material storage piles with tarpaulin or geo-textiles; tenting
 - ☐ Use of overhead water spray racks or water hoses
 - ☒ Track-out controls (graveled entranced, exit area, and street sweeping)
 - ☒ Landscape preservation and impact avoidance
 - ☐ Wind fence
 - ☐ Pre-watering of areas to be disturbed (including all unpaved onsite roads and staging areas)
 - ☒ Inform all subcontractors (including truck drivers) of their responsibilities for the control of fugitive dust while they are on the project site
 - ☐ Training of equipment operators to recognize fugitive dust generation and having the authority to shut down operations until water truck arrives and sprays water on the disturbed areas
 - ☐ Other Applicable BMPs: [Click or tap here to enter text.](#)
 - ☐ Other Applicable BMPs: [Click or tap here to enter text.](#)
 - ☒ If using water trucks, list how many water trucks are used and their capacity in gallons:
1 - 6,000 gallon water truck; 1 - 8,000 gallon water truck

PLANT BOUNDARY COORDINATES FORM

[illegible]

PLANT BUILDING PARAMETERS FORM *if applicable*

Building Parameters

Building Name: Administration Building (Building 1)
Roof Height (ft): 15

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
528,040	4,069,423		
528,041	4,069,405		
528,005	4,069,404		
528,003	4,069,422		

Building Parameters

Building Name: Container Management Building
Roof Height (ft): 40

Building Tier: 1
Building Diameter⁴ (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
527,811	4,069,053		
527,853	4,069,053		
527,854	4,069,039		
527,866	4,069,039		
527,866	4,068,992		
527,797	4,068,992		
527,797	4,069,005		
527,811	4,069,005		

Building Parameters

Building Name: Maintenance Building
Roof Height (ft): 20

Building Tier : 1
Building Diameter⁴ (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
527,563	4,069,141		
527,581	4,069,141		
527,581	4,069,118		
527,563	4,069,118		

PLANT BUILDING PARAMETERS FORM if applicable

Building Parameters

Building Name: PCB Processing **Building Tier:** 1
Roof Height (ft): 20 **Building Diameter⁴ (ft):** N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
527,886	4,069,140		
527,916	4,069,141		
527,917	4,069,127		
527,886	4,069,126		

Building Parameters

Building Name: Stab 2 Building **Building Tier:** 1
Roof Height (ft): 42 **Building Diameter (ft):** N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
528,044	4,069,097		
528,044	4,069,079		
528,085	4,069,079		
528,085	4,069,097		
Approximate building corner coordinates			

Building Parameters

Building Name: CMU-19 **Building Tier:** 1
Roof Height (ft): 40 **Building Diameter (ft):** n/a

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
528,044	4,069,150		
528,044	4,069,104		
528,038	4,069,104		
528,038	4,069,100		
528,017	4,069,100		
528,017	4,069,106		
527,995	4,069,106		
527,995	4,069,144		
528,013	4,069,144		
528,013	4,069,150		

PLANT BUILDING PARAMETERS FORM if applicable

Building Parameters

Building Name: Drum Re-Use Pad
Roof Height (ft): 20

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
528,060	4,069,184		
528,060	4,069,153		
528,045	4,069,154		
528,044	4,069,189		

Building Parameters

Building Name: Drum Re-Use Storage
Roof Height (ft): 20

Building Tier: 1
Building Diameter (ft): N/A

Building UTM Coordinates

UTM Easting	UTM Northing	UTM Easting	UTM Northing
528,042	4,069,220		
528,042	4,069,201		
528,024	4,069,200		
528,024	4,069,221		

APPLICATION CERTIFICATION DOCUMENT

(With Required Attachments)

Please check all applicable boxes below to indicate the information provided in your application submittal:

- ☒ General Company Information Form
- ☒ Industrial Process Application Form(s)
- ☐ Combustion Equipment Application Form(s)
- ☐ Storage Silos Application Form(s)
- ☐ Liquid Storage Tank Application Form(s)
- ☐ Manufacturer's Guarantee
- ☒ Facility-Wide Potential to Emit Table
- ☒ Surface Area Disturbance Form
- ☒ Plant Boundary Coordinates Form *if applicable*
- ☒ Plant Building Parameters Form *if applicable*
- ☒ Detailed Emission Calculations (for all emission units including IA units)
- ☒ Source Testing Data (if referenced in calculations)
- ☒ Process Narrative
- ☒ Process Flow Diagram(s)
- ☒ Site Plan(s) showing the locations (UTM coordinates), dimensions, and heights of buildings on the site
- ☒ Maps:
 - ☒ Vicinity Map of where the facility is located in the State
 - ☒ Area Map of the Facility (including location of all emission units, building locations (with UTM's), location of front gate, and fence line/site boundary (with UTM's))
- ☐ Environmental Evaluation (AERMOD Air Dispersion Modeling) *if applicable*
[NAC 445B.310]
- ☐ Manufacturer's Guarantee *if applicable*
- ☒ Equipment Specifications *if applicable*
- ☐ TANKs Modeling Output *if applicable*
- ☒ Application Fee Attached or Electronically Submitted
- ☒ Digital Copy of Application on CD or Thumb Drive
- ☒ Application Certification Document with Original Responsible Official Signature

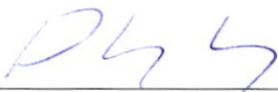
APPLICATION CERTIFICATION DOCUMENT (CONTINUED)
(With Required Attachments)

PLEASE NOTE THE FOLLOWING REQUIREMENTS WHICH APPLY TO PERMIT APPLICANTS DURING THE APPLICATION PROCESS:

- A. A permit applicant must submit supplementary facts or corrected information upon discovery [NAC 445B.297(1)(b)].
- B. A permit applicant is required to provide any additional information which the Director requests in writing within the time specified in the Director's request [NAC 445B.297(1)(c)].
- C. Submission of fraudulent data or other information may result in prosecution for an alleged criminal offense [NRS 445B.470].

CERTIFICATION:

I certify that, based on information and belief formed after reasonable inquiry, the statements and information contained in this application are true, accurate and complete.



Signature of Responsible Official

Pierre-luc Juteau, General Manager

Print or Type Name and Title

09/12/26

Date

US ECOLOGY NEVADA, INC.
DETAILED EMISSIONS CALCULATIONS

VOC and HAP Emissions - Hazardous Waste Stabilization Unit and Tanks

System #	Emissions Unit #	Emission Unit Description	Operating Hours		VOC Emissions (lb/hr)	VOC Emissions (ton/yr)	HAP ¹ Emissions (lb/hr)	HAP ¹ Emissions (ton/yr)	Emission Factor Reference
			hr/day	hr/yr					
13	PF1.010	Hazardous Waste Stabilization Unit	24	8,760	0.11	0.50	0.11	0.49	RFI Response 9/9/2019
18	S2.024	Gasoline Tank	24	8,760	0.27	1.16	N/A	N/A	TANKS 4.0.9d
21	S2.027	Liquid Gas Tank E-24	24	3,600	5.51	9.93	0.090	0.16	Refer to System 21 (S2.027) Liquid Gas Tank E-24 Worksheet
N/A	IA1.001	Diesel Storage Tank	24	8760	9.10E-04	4.00E-03	9.10E-04	4.00E-03	TANKS 4.0.9d
N/A	IA1.002	Used/Waste Oil Tank	24	8760	4.51E-05	1.98E-04	4.51E-05	1.98E-04	TANKS 5.1
N/A	IA1.003	Used/Waste Oil Tank	24	8760	1.05E-04	4.61E-04	1.05E-04	4.61E-04	TANKS 5.1
N/A	IA1.007	Propane Storage Tank	24	8760	0.0686	0.3005	0.0686	0.3005	TANKS 4.0.9d
N/A	IA1.010	Surge Tank	24	8760	0.0167	0.0731	0.0167	0.0731	TANKS 4.0.9d
N/A	IA1.011	Separator Tank	24	8760	0.0167	0.0731	0.0167	0.0731	TANKS 4.0.9d
N/A	IA1.012	LPG Mix Storage Tank #1	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.013	Propane Tank 2	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.014	Propane Tank 3	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.015	Propane Tank 4	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.016	Propane Tank 5	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.017	Propane Tank 6	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.018	Propane Tank 7	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
N/A	IA1.019	Propane Tank 8	24	8760	0.0425	0.1863	0.0425	0.1863	TANKS 4.0.9d
TOTAL EMISSIONS					6.33	13.51	0.64	2.59	

NOTES: ¹ Except for Systems 14, 18 and 21, HAP emissions are assumed to be equal to VOC emissions

IA1.020 & IA1.021 - Cooling Tower Emissions Calculations

AP-42, Chapter 13.4, Wet Cooling Towers

Water Circulation Rate = 180 gpm
Drift Rate = 0.002 %
Maximum TDS Content = 1,500 ppm
Water Density = 8.34 lb/gal
 $PM_{2.5}$ = 1.0 PM_{10}

 PM_{10} = Water Circulation Rate x Drift Rate x TDS

	Hourly Rate (lb/hr)	Annual Rate (ton/yr)
PM	2.70E-03	0.012
PM₁₀	2.70E-03	0.012
PM_{2.5}	2.70E-03	0.012

System 19 (S2.025) - Aerosol Can Crusher**System Assumptions**

System can process 2,000 pounds of cans per hour

PTE assumes worst case that all cans are entirely full

Propellant generation rate = 15.43% propellant of can weight when full

Propellant capture efficiency = 99.154% recovered as liquid product

System is operated under vacuum (1,500 M3/hr ventilation system). The remaining 0.846% (nitrogen, propellant vapor and air from hopper loading and metal brick ejection processes, IBC, etc.) is captured and exhausted through activated carbon.

Activated carbon capture efficiency = 90%

Aerosol Can Crusher PTE Information

Process Capacity =	2,000 lb/hr of cans (to be weighed in a hopper prior to processing)
Propellant =	15.43 % of contents
Propellant Capture Efficiency =	99.15 % recovered
Propellant Not Recovered =	0.846 % unrecovered
Propellant Collection Rate =	306 lb/hr
Unrecovered (gaseous) Propellant sent to carbon=	2.61 lb/hr
Activated Carbon Capture Efficiency =	90 % (captures unrecovered propellant)
Operating Hours =	24 hr/day
Operating Days =	6 day/wk
Operating Weeks =	50 wks/yr
Operating Hours =	3,600 hr/yr

Aerosol Can Crusher PTE Emissions

VOC PTE Emissions		HAP PTE Emissions ¹	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
0.26	0.47	0.26	0.47

NOTE: ¹ HAP emissions are assumed to be equal to VOC emissions

System 21 (S2.027) - Liquid Gas Tank E-24**System Information**

Tank Discharge Episode =	75 sec/hr
Operating Hours =	24 hr/day
Operating Days =	6 day/wk
Operating Weeks =	50 wks/yr
Annual Operating Hours =	3,600 hr/yr
Safety Factor =	1.5

Liquid Gas Tank E-24 PTE Emissions

Compound	VOC/HAP	Measured Emission Rate (lb/episode hr)	Emission Rate (lb/episode hr)	Emission Rate (ton/yr)
Freon 12 (Dichlorodifluoromethane); CCl ₂ F ₂	VOC	5.87E-02	0.088	0.158
Freon 11 (Trichlorofluoromethane); CCl ₃ F	VOC	4.02E-03	0.006	0.011
Acetone; C ₃ H ₆ O	VOC	4.92E-01	0.739	1.329
Methylene Chloride (Dichloromethane); CH ₂ Cl ₂	HAP	1.96E-02	0.029	0.053
Hexane; C ₆ H ₁₄	HAP	2.92E-02	0.044	0.079
1,1,1,-Trichloroethane; C ₂ H ₃ Cl ₃	HAP	5.45E-03	0.008	0.015
Cyclohexane; C ₆ H ₁₂	VOC	7.13E-03	0.011	0.019
Heptane; C ₇ H ₁₆	VOC	9.27E-03	0.014	0.025
Toluene; C ₇ H ₈	HAP	5.47E-03	0.008	0.015
Freon 134a Norflurane	VOC	4.44E-01	0.666	1.198
3-methylhexane	VOC	2.78E-02	0.042	0.075
Propane	VOC	9.52E-01	1.427	2.569
Isobutane	VOC	5.37E-01	0.806	1.451
Butane	VOC	9.41E-01	1.411	2.540
2-methylbutane	VOC	9.45E-03	0.014	0.026
Pentane	VOC	1.06E-02	0.016	0.029
Ethyl Ether	VOC	1.43E-02	0.021	0.039
2-methylpentane	VOC	5.91E-02	0.089	0.160
3-methylpentane	VOC	2.32E-02	0.035	0.063
2-methylhexane	VOC	2.08E-02	0.031	0.056

VOC PTE Emissions		HAP PTE Emissions	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
5.51	9.91	0.090	0.16

NOTES:

- 1) Measured Emission Rate = based on 1/26/2021 stack test data obtain using EPA Method TO-15 in an engineering test run collected over 1 hour of system operation. Actual off-gassing occurred for 75 seconds during the hour.
- 2) Emission Rate = includes 1.5x safety factor to account for fluctuations in duration or concentration of discharge.

Systems 25a & 25b - Aerosol Can Crusher II**System Assumptions**

System vents include: Compactor Purging Vent (CPU), Local Exhaust Vent (LEV), and Non-Condensables Vent (NCV)
 The CPU, LEV and NCV are routed through the carbon filter air pollution control device
 System can process 3,000 pounds of cans per hour
 PTE assumes worst case that all cans are entirely full

System 25a - S2.039: Compactor Purging Vent (CPU) and Local Exhaust Vent (LEV)

CPU and LEV, combined, are similar to Aerosol Can Crusher (S2.025) and are using the same system assumptions
 Propellant generation rate = 15.43% propellant of can weight when full
 Propellant capture efficiency = 99.154% recovered as liquid product
 System is operated under vacuum (1,500 m3/hr ventilation system). The remaining 0.846% (nitrogen, propellant vapor and air from hopper loading and metal brick ejection processes, IBC, etc.) is captured and exhausted through activated carbon

CPU & LEV Assumptions

Process Capacity =	3,000 lb/hr of cans (to be weighed in a hopper prior to processing)
Propellant =	15.43 % of contents
Propellant Capture Efficiency =	99.15 % recovered
Propellant Not Recovered =	0.846 % unrecovered
Propellant Collection Rate =	459 lb/hr
Unrecovered (gaseous) Propellant sent to carbon =	3.92 lb/hr
Activated Carbon Capture Efficiency =	90 % (captures unrecovered propellant)
Operating Hours =	24 hr/day
Operating Days =	6 day/wk
Operating Weeks =	50 wks/yr
Operating Hours =	3,600 hr/yr
Safety Factor =	1.75

System 25b - S2.040: Non-Condensables Vent (NCV)

The NCV is similar to Liquid Gas Tank E-24 (S2.027) and is using the same system assumptions

NCV Assumptions

Activated Carbon Capture Efficiency =	90 %
Discharge Episode =	75 sec/hr
Operating Hours =	24 hr/day
Operating Days =	6 day/wk
Operating Weeks =	50 wks/yr
Annual Operating Hours =	3,600 hr/yr
Safety Factor =	30.6
Safety Factor =	

Compound	VOC/HAP	Measured Emission Rate (lb/episode hr)	Emission Rate (ton/yr)
Freon 12 (Dichlorodifluoromethane), CCl ₂ F ₂	VOC	5.87E-02	0.106
Freon 11 (Trichlorofluoromethane), CCl ₃ F	VOC	4.02E-03	0.007
Acetone, C ₃ H ₆ O	VOC	4.92E-01	0.886
Methylene Chloride (Dichloromethane), CH ₂ Cl ₂	HAP	1.96E-02	0.035
Hexane, C ₆ H ₁₄	HAP	2.92E-02	0.053
1,1,1-Trichloroethane, C ₂ H ₃ Cl ₃	HAP	5.45E-03	0.010
Cyclohexane, C ₆ H ₁₂	VOC	7.13E-03	0.013
Heptane, C ₇ H ₁₆	VOC	9.27E-03	0.017
Toluene, C ₇ H ₈	HAP	5.47E-03	0.010
Freon 134a Norflurane	VOC	4.44E-01	0.799
3-methylhexane	VOC	2.78E-02	0.050
Propane	VOC	9.52E-01	1.713
Isobutane	VOC	5.37E-01	0.967
Butane	VOC	9.41E-01	1.693
2-methylbutane	VOC	9.45E-03	0.017
Pentane	VOC	1.06E-02	0.019
Ethyl Ether	VOC	1.43E-02	0.026
2-methylpentane	VOC	5.91E-02	0.106
3-methylpentane	VOC	2.32E-02	0.042
2-methylhexane	VOC	2.08E-02	0.038

NOTE: Measured Emission Rate = based on Tank E-24 (S2.027) 1/26/2021 stack test data obtained using EPA Method TO-15 in an engineering test run collected over 1 hour of system operation. Actual off-gassing occurred for 75 seconds during the test.

Systems 25a & 25b - Aerosol Can Crusher II PTE Emissions**System 25a - S2.039: CPU & LEV PTE Emissions**

VOC PTE Emissions		HAP PTE Emissions ¹	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
0.69	1.23	0.69	1.23

System 25b - S2.040: NCV PTE Emissions

VOC PTE Emissions		HAP PTE Emissions	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
11.24	20.23	0.18	0.33

NOTE: ¹CPU & LEV - HAP emissions are assumed to be equal to VOC emissions

System 14 (\$2.015) - Soil Vapor Extraction Well (located near Trench 10) VOC EmissionsCan Crusher Fuel to Thermal Oxidizer Information and Assumptions

Operating hours: 8,760 hr/yr
 Fuel type: Propane & Butane mix
 Fuel heat input: 0.093 MMBtu/gal
 Fuel heat input: 0.80 MMBtu/hr
 Fuel thruput: 8.60 gal/hr
 Fuel Propane Estimate: 25 %
 Fuel Butane Estimate: 50 %
 Fuel Unknown VOCs Estimate: 25 %
 Safety Factor: 2
 Butane VOC emission factor: 0.0011 lb/gal (AP-42, Table 1.5-1)

Total Fuel VOCs to TO = 0.019 lb/hr 0.083 ton/yr
Total Fuel HAPs to TO = 0.019 lb/hr 0.083 ton/yr

NOTE: Assume HAP emissions equal VOC emissions for Can Crusher fuel

Soil Vapor Extraction (SVE) Well Information and Assumptions

SVE Well Flowrate to TO System: 100 ft3/min
 Hours of operation: 24 hr/day
 Hours of operation: 8,760 hr/yr

SVE Well Laboratory Results

#	Compound	CAS #	HAP	RDL (ug/m3)	Result (ug/m3)	Mass to TO (lb/hr)
1	TPH (GC/MS) Low Fraction	8006-61-9	---	4130000	15100000	5.66
2	Allyl chloride	107-05-1	HAP	62.6	ND	2.35E-05
3	Benzene	71-43-2	HAP	3190	120000	4.50E-02
4	Benzyl Chloride	100-44-7	HAP	104	ND	3.90E-05
5	Bromodichloromethane	75-27-4	---	134	ND	5.02E-05
6	Bromoform	75-25-2	HAP	621	ND	2.33E-04
7	Bromomethane	74-83-9	HAP	77.6	ND	2.91E-05
8	1,3-Butadiene	106-99-0	HAP	443	ND	1.66E-04
9	Carbon disulfide	75-15-0	HAP	6220	130000	4.87E-02
10	Carbon tetrachloride	56-23-5	HAP	6300	210000	7.87E-02
11	Chlorobenzene	108-90-7	HAP	92.4	41800	1.57E-02
12	Chloroethane	75-00-3	HAP	52.8	9230	3.46E-03
13	Chloroform	67-66-3	HAP	4870	1410000	5.28E-01
14	Chloromethane	74-87-3	HAP	2070	99100	3.71E-02
15	2-Chlorotoluene	95-49-8	---	103	ND	3.86E-05
16	Cyclohexane	110-82-7	---	34400	3010000	1.13E+00
17	Dibromochloromethane	124-48-1	---	170	ND	6.37E-05
18	1,2-Dibromoethane	106-93-4	HAP	154	ND	5.77E-05
19	1,2-Dichlorobenzene	95-50-1	---	120	7640	2.86E-03
20	1,3-Dichlorobenzene	541-73-1	---	120	ND	4.50E-05
21	1,4-Dichlorobenzene	106-46-7	HAP	120	3850	1.44E-03
22	1,2-Dichloroethane	107-06-2	HAP	81.0	ND	3.04E-05
23	1,1-Dichloroethane	75-34-3	HAP	4010	593000	2.22E-01
24	1,1-Dichloroethene	75-35-4	HAP	3960	412000	1.54E-01
25	cis-1,2-Dichloroethene	156-59-2	---	3960	237000	8.88E-02
26	trans-1,2-Dichloroethene	156-60-5	---	79.3	15200	5.70E-03
27	1,2-Dichloropropane	78-87-5	HAP	4620	183000	6.86E-02
28	cis-1,3-Dichloropropene	10061-01-5	---	90.8	ND	3.40E-05
29	trans-1,3-Dichloropropene	10061-02-6	---	90.8	ND	3.40E-05
30	1,4-Dioxane	123-91-1	HAP	227	ND	8.51E-05
31	Ethanol	64-17-5	---	471	ND	1.76E-04
32	Ethylbenzene	100-41-4	HAP	4340	198000	7.42E-02
33	4-Ethyltoluene	622-96-8	---	98.2	1900	7.12E-04
34	Trichlorofluoromethane	75-69-4	---	112	21700	8.13E-03
35	Dichlorodifluoromethane	75-71-8	---	4950	93500	3.50E-02

System 14 (S2.015) - Soil Vapor Extraction Well (located near Trench 10) VOC Emissions

#	Compound	CAS #	HAP	RDL (ug/m3)	Result (ug/m3)	Mass to TO (lb/hr)
36	1,1,2-Trichlorotrifluoroethane	76-13-1	---	7660	615000	2.30E-01
37	1,2-Dichlorotetrafluoroethane	76-14-2	---	140	ND	5.25E-05
38	Heptane	142-82-5	---	81.8	35500	1.33E-02
39	Hexachloro-1,3-butadiene	87-68-3	HAP	673	1450	5.43E-04
40	n-Hexane	110-54-3	HAP	111000	3670000	1.38E+00
41	Isopropylbenzene	98-82-8	HAP	98.3	2530	9.48E-04
42	Methylene Chloride	75-09-2	HAP	34700	2470000	9.26E-01
43	Methyl Butyl Ketone	591-78-6	---	511	ND	1.91E-04
44	2-Butanone (MEK)	78-93-3	HAP	18400	73100	2.74E-02
45	4-Methyl-2-pentanone (MIBK)	108-10-1	HAP	25600	1710000	6.41E-01
46	Methyl methacrylate	80-62-6	HAP	81.9	ND	3.07E-05
47	MTBE	1634-04-4	HAP	72.1	ND	2.70E-05
48	Naphthalene	91-20-3	HAP	330	ND	1.24E-04
49	2-Propanol	67-63-0	---	307	ND	1.15E-04
50	Propene	115-07-1	---	215	ND	8.06E-05
51	Styrene	100-42-5	HAP	170	ND	6.37E-05
52	1,1,2,2-Tetrachloroethane	79-34-5	HAP	137	ND	5.13E-05
53	Tetrachloroethylene	127-18-4	HAP	6790	3010000	1.13E+00
54	Tetrahydrofuran	109-99-9	---	29500	3270000	1.23E+00
55	Toluene	108-88-3	HAP	94200	2280000	8.54E-01
56	1,2,4-Trichlorobenzene	120-82-1	HAP	466	ND	1.75E-04
57	1,1,1-Trichloroethane	71-55-6	HAP	5440	123000	4.61E-02
58	1,1,2-Trichloroethane	79-00-5	HAP	109	2000	7.49E-04
59	Trichloroethylene	79-01-6	HAP	5360	1020000	3.82E-01
60	1,2,4-Trimethylbenzene	95-63-6	---	98.2	4690	1.76E-03
61	1,3,5-Trimethylbenzene	108-67-8	---	98.2	3210	1.20E-03
62	2,2,4-Trimethylpentane	540-84-1	HAP	93.4	24900	9.33E-03
63	Vinyl chloride	75-01-4	HAP	51.1	10100	3.78E-03
64	Vinyl Bromide	593-60-2	HAP	87.5	ND	3.28E-05
65	Vinyl acetate	108-05-4	HAP	222	ND	8.32E-05
66	m&p-Xylene	179601-23-1	HAP	8670	370000	1.39E-01
67	o-Xylene	95-47-6	HAP	4340	103000	3.86E-02
68	Acetone	67-64-1	---	14900	219000	8.21E-02

NOTES: 1) Veritas Laboratory - ID V24H213-01; Sample Date: 08/24/2024 11:00 am.

2) Compound result = ND: Reported Detection Limit (RDL) was used to calculate "Mass to TO".

3) RDL = Reported Detection Limit

Thermal Oxidizer System Information & Assumptions

Manufacturer: Beaudin Consulting Equipment Co.

Model & SN: Model NV04, SN unknown

Date of Manufacture: October 2024

Minimum internal temperature: 1,600 °F

Maximum internal temperature: 2,200 °F

Internal air volume: 210 ft³

VOC Manufacturer Guarantee: 15 ppm

VOC emissions control: 90 % reduction

Total SVE Well VOCs to TO = 15.33 lb/hr 67.16 ton/yr

Total SVE Well HAPs to TO = 6.85 lb/hr 30.01 ton/yr

SVE Well TO System Emissions

VOC PTE Emissions		HAP PTE Emissions	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
1.55	6.80	0.70	3.08

System 14 Alt Scenario (S2.015alt) - Soil Vapor Extraction Well (located near Trench 10) VOC EmissionsSoil Vapor Extraction (SVE) Well Information and Assumptions

SVE Well Flowrate to TO System: 30 ft³/min
 Hours of operation: 24 hr/day
 Hours of operation: 8,760 hr/yr

SVE Well Laboratory Results

#	Compound	CAS #	HAP	RDL (ug/m3)	Result (ug/m3)	Mass to Filter (lb/hr)
1	TPH (GC/MS) Low Fraction	8006-61-9	---	4130000	15100000	1.70
2	Allyl chloride	107-05-1	HAP	62.6	ND	7.04E-06
3	Benzene	71-43-2	HAP	3190	120000	1.35E-02
4	Benzyl Chloride	100-44-7	HAP	104	ND	1.17E-05
5	Bromodichloromethane	75-27-4	---	134	ND	1.51E-05
6	Bromoform	75-25-2	HAP	621	ND	6.98E-05
7	Bromomethane	74-83-9	HAP	77.6	ND	8.72E-06
8	1,3-Butadiene	106-99-0	HAP	443	ND	4.98E-05
9	Carbon disulfide	75-15-0	HAP	6220	130000	1.46E-02
10	Carbon tetrachloride	56-23-5	HAP	6300	210000	2.36E-02
11	Chlorobenzene	108-90-7	HAP	92.4	41800	4.70E-03
12	Chloroethane	75-00-3	HAP	52.8	9230	1.04E-03
13	Chloroform	67-66-3	HAP	4870	1410000	1.59E-01
14	Chloromethane	74-87-3	HAP	2070	99100	1.11E-02
15	2-Chlorotoluene	95-49-8	---	103	ND	1.16E-05
16	Cyclohexane	110-82-7	---	34400	3010000	3.38E-01
17	Dibromochloromethane	124-48-1	---	170	ND	1.91E-05
18	1,2-Dibromoethane	106-93-4	HAP	154	ND	1.73E-05
19	1,2-Dichlorobenzene	95-50-1	---	120	7640	8.59E-04
20	1,3-Dichlorobenzene	541-73-1	---	120	ND	1.35E-05
21	1,4-Dichlorobenzene	106-46-7	HAP	120	3850	4.33E-04
22	1,2-Dichloroethane	107-06-2	HAP	81.0	ND	9.11E-06
23	1,1-Dichloroethane	75-34-3	HAP	4010	593000	6.67E-02
24	1,1-Dichloroethene	75-35-4	HAP	3960	412000	4.63E-02
25	cis-1,2-Dichloroethene	156-59-2	---	3960	237000	2.66E-02
26	trans-1,2-Dichloroethene	156-60-5	---	79.3	15200	1.71E-03
27	1,2-Dichloropropane	78-87-5	HAP	4620	183000	2.06E-02
28	cis-1,3-Dichloropropene	10061-01-5	---	90.8	ND	1.02E-05
29	trans-1,3-Dichloropropene	10061-02-6	---	90.8	ND	1.02E-05
30	1,4-Dioxane	123-91-1	HAP	227	ND	2.55E-05
31	Ethanol	64-17-5	---	471	ND	5.29E-05
32	Ethylbenzene	100-41-4	HAP	4340	198000	2.23E-02
33	4-Ethyltoluene	622-96-8	---	98.2	1900	2.14E-04
34	Trichlorofluoromethane	75-69-4	---	112	21700	2.44E-03
35	Dichlorodifluoromethane	75-71-8	---	4950	93500	1.05E-02
36	1,1,2-Trichlorotrifluoroethane	76-13-1	---	7660	615000	6.91E-02
37	1,2-Dichlorotetrafluoroethane	76-14-2	---	140	ND	1.57E-05
38	Heptane	142-82-5	---	81.8	35500	3.99E-03
39	Hexachloro-1,3-butadiene	87-68-3	HAP	673	1450	1.63E-04
40	n-Hexane	110-54-3	HAP	111000	3670000	4.13E-01
41	Isopropylbenzene	98-82-8	HAP	98.3	2530	2.84E-04

System 14 Alt Scenario (S2.015alt) - Soil Vapor Extraction Well (located near Trench 10) VOC Emissions

#	Compound	CAS #	HAP	RDL (ug/m3)	Result (ug/m3)	Mass to Filter (lb/hr)
42	Methylene Chloride	75-09-2	HAP	34700	2470000	2.78E-01
43	Methyl Butyl Ketone	591-78-6	---	511	ND	5.74E-05
44	2-Butanone (MEK)	78-93-3	HAP	18400	73100	8.22E-03
45	4-Methyl-2-pentanone (MIBK)	108-10-1	HAP	25600	1710000	1.92E-01
46	Methyl methacrylate	80-62-6	HAP	81.9	ND	9.21E-06
47	MTBE	1634-04-4	HAP	72.1	ND	8.11E-06
48	Naphthalene	91-20-3	HAP	330	ND	3.71E-05
49	2-Propanol	67-63-0	---	307	ND	3.45E-05
50	Propene	115-07-1	---	215	ND	2.42E-05
51	Styrene	100-42-5	HAP	170	ND	1.91E-05
52	1,1,2,2-Tetrachloroethane	79-34-5	HAP	137	ND	1.54E-05
53	Tetrachloroethylene	127-18-4	HAP	6790	3010000	3.38E-01
54	Tetrahydrofuran	109-99-9	---	29500	3270000	3.68E-01
55	Toluene	108-88-3	HAP	94200	2280000	2.56E-01
56	1,2,4-Trichlorobenzene	120-82-1	HAP	466	ND	5.24E-05
57	1,1,1-Trichloroethane	71-55-6	HAP	5440	123000	1.38E-02
58	1,1,2-Trichloroethane	79-00-5	HAP	109	2000	2.25E-04
59	Trichloroethylene	79-01-6	HAP	5360	1020000	1.15E-01
60	1,2,4-Trimethylbenzene	95-63-6	---	98.2	4690	5.27E-04
61	1,3,5-Trimethylbenzene	108-67-8	---	98.2	3210	3.61E-04
62	2,2,4-Trimethylpentane	540-84-1	HAP	93.4	24900	2.80E-03
63	Vinyl chloride	75-01-4	HAP	51.1	10100	1.14E-03
64	Vinyl Bromide	593-60-2	HAP	87.5	ND	9.84E-06
65	Vinyl acetate	108-05-4	HAP	222	ND	2.50E-05
66	m&p-Xylene	179601-23-1	HAP	8670	370000	4.16E-02
67	o-Xylene	95-47-6	HAP	4340	103000	1.16E-02
68	Acetone	67-64-1	---	14900	219000	2.46E-02

NOTES: 1) Veritas Laboratory - ID V24H213-01; Sample Date: 08/24/2024 11:00 am.

2) Compound result = ND: Reported Detection Limit (RDL) was used to calculate "Mass to TO".

3) RDL = Reported Detection Limit

Activated Carbon Control System Information & Assumptions

Manufacturer: Unknown

Model & SN: Unknown

Date of Manufacture: Unknown

Maximum internal temperature: Ambient

VOC emissions control: 95 % reduction

Safety Control = 1

Total SVE Well VOCs to Carbon = 4.60 lb/hr 20.15 ton/yr

Total SVE Well HAPs to Carbon = 2.06 lb/hr 9.00 ton/yr

SVE Well Activated Carbon Control System Emissions

VOC PTE Emissions		HAP PTE Emissions	
(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
0.23	1.01	0.10	0.45

Systems 26a & 26b - Tank Farm Acid/Base Neutralization System**Acid/Base Neutralization System Information**

Number of Reactor Tanks =	2
Number of Acid Tanks =	2
Reactor Tank Caustic Capacity (V) =	7,500 gal (each)
Acid Tank Capacity (V) =	7,500 gal (each)
Tank Operating Hours =	24 hr/day
Tank Operating Hours =	365 day/yr
Tank Operating Hours =	8,760 hr/yr
Reactor Tank =	1 tank fill/day/tank
Reactor Tank Thruput =	30,000 gal/day
Reactor Tank Thruput =	10,950,000 gal/yr
Acid Tank =	1 tank fill/day/tank
Acid Thruput =	15,000 gal/day
Acid Thruput =	5,475,000 gal/yr
Scrubber Control Efficiency =	80 %
Reactor Scrubber Vapor Flow Rate =	1,900 cfm
Acid Scrubber Vapor Flow Rate =	1,100 cfm

Acid/Base Neutralization Tank HAP Uncontrolled Calculations

Equation: $PV = nRT$

P =	18 mmHg
V =	(see above) gal
n =	36.5 g/mole (HCl)
R =	0.0821 atm-L / mole / °K
T =	298.15 °K
Tank Pressure =	1 ATM (ambient pressure/non-pressurized tanks)
Tank Temperature =	25 °C
Tank Temperature =	298 °K
mmHg =	760 atm
lb =	453.59 gram
gal =	3.785 liter
ton =	2,000 lbs
HAP Safety Factor =	2

EU	Description	HAP Uncontrolled Emissions	
		(lb/hr)	(ton/yr)
S2.041	Acid Neutralization Reactor Tank T-1	0.37	1.61
S2.042	Acid Neutralization Reactor Tank T-2	0.37	1.61
S2.043	Acid Storage Tank T-3	0.37	1.61
S2.044	Acid Storage Tank T-4	0.37	1.61

Acid/Base Neutralization Tank VOC PTE Calculations

Performance Testing Date =	6/2/2026
Run 1 Results =	0.059 lb/hr
VOC Safety Factor =	5

NOTES: 1) Run with the highest VOC concentration was used for the PTE calculations
 2) Refer to Performance Testing Report in Appendix "Tank Farm Acid/Base Neutralization System Source Testing"

Tank Farm Acid/Base Neutralization System PTE Emissions

EU	Description	VOC PTE Emissions		HAP PTE Emissions	
		(lb/hr)	(ton/yr)	(lb/hr)	(ton/yr)
S2.041	Acid Neutralization Reactor Tank T-1	0.30	1.29	0.074	0.32
S2.042	Acid Neutralization Reactor Tank T-2			0.074	0.32
S2.043	Acid Storage Tank T-3			0.074	0.32
S2.044	Acid Storage Tank T-4			0.074	0.32

NOTES: 1) Emissions occur only during the displacement of air while loading tanks and during tank transfers
 2) All acid is assumed to be 20% hydrochloric acid (HCl) aqueous solution at 25 °C. (worst case volatility is assumed)

US ECOLOGY NEVADA, INC.
PROCESS NARRATIVE

Process Narrative

Permitted in 1961, the Beatty facility was the first commercially operated solid, low-level radioactive waste site. The last trench to receive radiological wastes was closed in 1992. The Nevada Division of Health (NDH) accepted custodial care for the Low-Level Radioactive Waste Disposal Facility (LLRWDF) under terms of the 1977 lease conditions, a 1993 settlement agreement, and provisions of the Nevada Administrative Code (NAC).

The Beatty facility began receiving liquid and solid chemical wastes in 1971. After 1979, liquid wastes were no longer accepted for direct disposal. The Hazardous Waste Management Facility (HWMF) manages the disposal of hazardous waste using a trench system. Trench 13 began operation in 2017 and will receive waste for an estimated 25 years.

The northern Mojave Desert, one of the most arid regions of the United States, surrounds the site. No permanent residents live within a 10-mile radius around the site. US Highway 95 runs in a southeast to northwest direction about 1,800 feet from the property fence line. The nearest residents are located in Beatty, Nevada approximately 11 miles north of the facility. Las Vegas, Nevada is about 120 miles southeast of the site.

Screening Plant

The portable screening plant is operated infrequently throughout the year. Native uncontaminated soil is fed to a grizzly hopper. The grizzly discharges to a conveyor which in turn discharges to a screen. Screened soil is discharged to the oversize, intermediate, or fines conveyor systems. Each conveyor discharges to a stockpile. Emissions are controlled by water sprays. The soil that has been processed through the screening plant is typically used for road maintenance and berms.

Hazardous Waste Management Process

Reagent from Stabilization Reagent Silos #8 and #9 are discharged into a loader bucket and transported to the Hazardous Waste Stabilization Unit (STAB) Building. Silo loading emissions are controlled by bin vents, and discharge emissions are uncontrolled.

Reagent from Stabilization Reagent Silos #10 and #11 are discharged into a loader bucket and transported to the Stabilization 2 (STAB2) Building. Silo loading emissions are controlled by bin vents, and discharge emissions are uncontrolled.

Reagent and hazardous waste material are transported by either loader bucket or truck, and discharged to Mixing Tanks #4, #5, #6, #7, and #8. Mixing Tank #8 also receives hazardous waste from the shredder. Mixing Tanks #4 and #5 are located inside the Stabilization Building, and Mixing Tanks #6, #7, and #8 are located inside the Stabilization 2 Building. Particulate emissions from mixing tank loading operations and the mixing tanks are controlled by baghouses.

Once the reagents and hazardous waste material are mixed, the stabilized product is discharged into a cell at the containment area located on the facility's property.

A soil vapor extraction (SVE) well is located on-site. Soil vapors containing organic constituents are extracted from the vadose zone beneath the site and treated through a combination thermal oxidizer and wet scrubber system (TO system) with a carbon filter backup (alternative) control for the SVE system. The SVE was tested in October 2019 and shown to be operating in compliance.

Aerosol Can Recycling Process

Aerosol cans are weighed and then loaded into aerosol can crusher hoppers. After crushing, the metal is transported to an off-site metal recycling facility, and the aerosol liquid and propellant gas is transferred to separator tanks. The propellant gas is drawn out of the aerosol liquid and transferred into surge tanks. The gas is then compressed and transferred either to the mix control tank (Tank E-24) or to a liquid separator which vents to the Non-Condensables Vent (NCV), and finally to storage tanks. The liquid from the separator tanks is transferred to the sludge container and transported off-site. HAP and VOC emissions from the Aerosol Can Crusher and Aerosol Can Crusher II are controlled by carbon filter systems. Tank E-24 and NCV are both uncontrolled.

Tank Farm Acid/Base Neutralization System

The acid/base neutralization system includes truck and drum unloading to two (2) caustic storage/acid neutralization reactor tanks; two (2) acid storage tanks; and two (2) cooling towers. The caustic storage/acid neutralization reactor tanks receive waste caustic solution from the unloading process and acid from the acid storage tanks to generate a pH neutral solution. Pollutant emissions occur during the displacement of air while loading tanks and during tank transfers. Acid neutralization reactor tank HAP emissions are vented to a waste caustic scrubber and acid storage tank HAP emissions are vented to an acid scrubber. The cooling towers are located on the acid neutralization reactor tank side of the system and are used to control the solution temperature.

Insignificant Activities

IA1.001	Diesel tank (8,000 gallons)
IA1.002	Waste oil storage tank (1,000 gallons)
IA1.003	Waste oil storage tank (3,000 gallons)
IA1.007	Propane storage tank (1,000 gallons)
IA1.010	LPG surge tank, 265 gallons
IA1.011	Propane separator tank, 265 gallons
IA1.012	LPG mix storage tank #1, 1,000 gallons
IA1.013	Propane tank 2 (1,000 gallons)
IA1.014	Propane tank 3 (1,000 gallons)
IA1.015	Propane tank 4 (1,000 gallons)
IA1.016	Propane tank 5 (1,000 gallons)
IA1.017	Propane tank 6 (1,000 gallons)
IA1.018	Propane tank 7 (1,000 gallons)
IA1.019	Propane tank 8 (1,000 gallons)
IA1.020	Cooling Tower CT-1
IA1.021	Cooling Tower CT-2

Description of Proposed Permit Revision

Following is the proposed revision that is included in this permit application package.

System 26a - Tank Farm Acid/Base Neutralization System

S2.041, 17,110 Gallon Caustic Storage Tank / Waste Acid Neutralization Reactor Tank T-1

S2.042, 17,110 Gallon Caustic Storage Tank / Waste Acid Neutralization Reactor Tank T-2

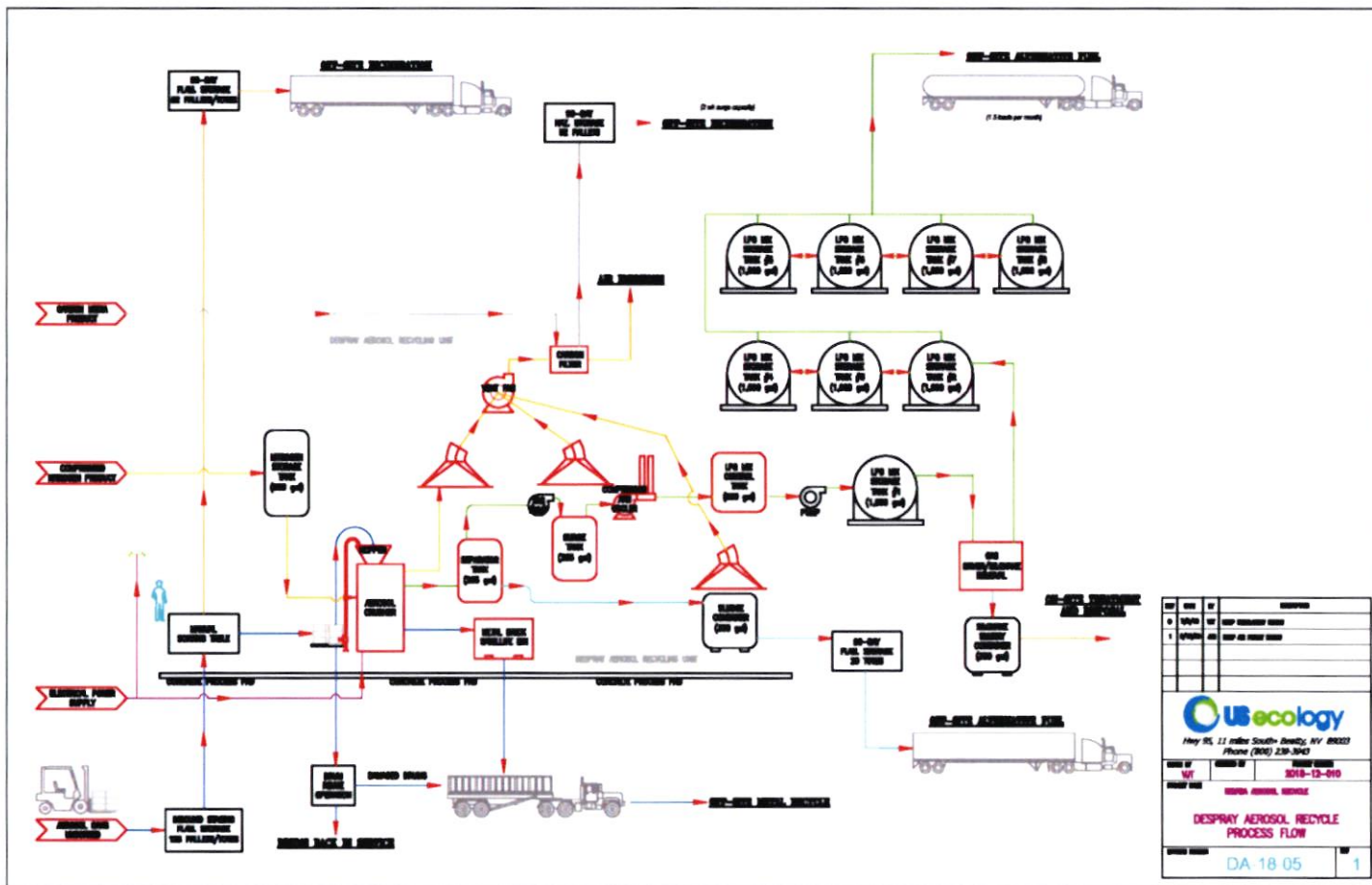
System 26b - Tank Farm Acid/Base Neutralization System

S2.043, 8,200 Gallon Waste Acids Storage Tank T-3

S2.044, 8,200 Gallon Waste Acids Storage Tank T-4

The acid/base neutralization system was performance tested on June 2, 2026. It was discovered that VOC emissions are not negligible during the testing, therefore this revision application is being submitted to include VOC emissions from the acid/base neutralization system. Refer to the emissions calculations worksheet in appendix "System 26 - Tank Farm Acid/Base Neutralization System" for additional information. The performance test report (appendices not included) is included in appendix "Tank Farm Acid/Base Neutralization System Source Testing".

US ECOLOGY NEVADA, INC.
PROCESS FLOW DIAGRAMS



REV	DATE	BY	DESCRIPTION
0	1/1/00	WJ	NEW PROCESS FLOW
1	1/1/00	WJ	NEW AIR FLOW FLOW
			
Hwy 95, 11 miles South Nevada, NV 89023 Phone (800) 230-3043			
NAME OF	DESIGN BY	DESIGN NUMBER	
WJ	WJ	2010-12-010	
PROJECT NAME	DESIGN AEROSOL RECYCLE		
DESPIRAY AEROSOL RECYCLE PROCESS FLOW			
DESIGN NUMBER	DA 18 05		1

Aerosol Can Crusher II Emission Points
(CPU & LEV vent through carbon filter)

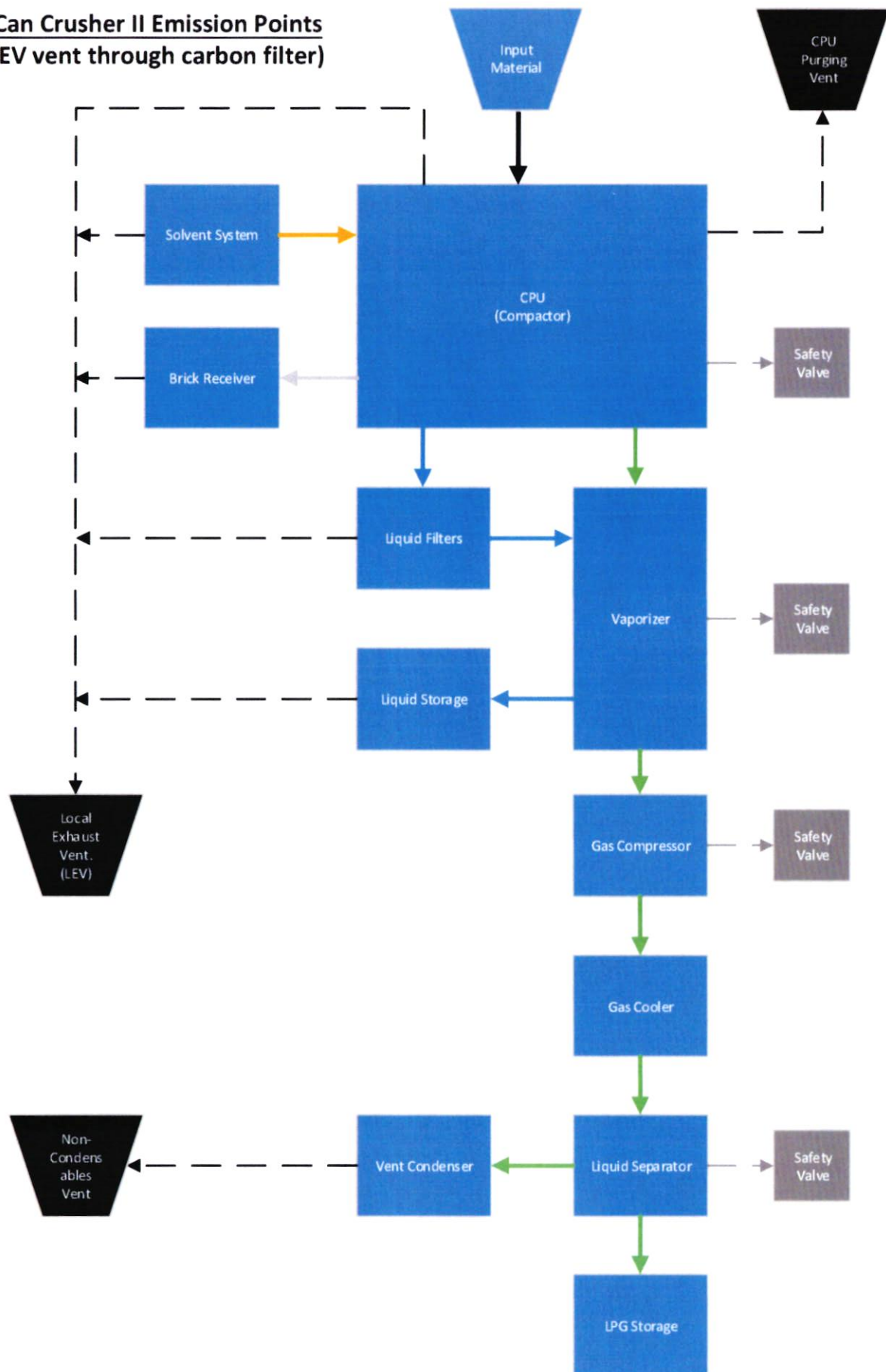


Diagram illustrating the layout of a chemical processing plant, showing various equipment and piping systems. Key components labeled include:

- RECOVERED LIQUID IBC
- GAS COMPRESSOR
- GAS COOLER
- LPG SEPARATOR
- HEATER
- VAPORIZER TANK
- SOLVENT IBC
- HMB SCREEN
- SHIP HOIST
- CENTRAL PROCESSING UNIT
- CHURLEY STRAINER
- MAIN PANEL
- HYDRAULIC POWER UNIT
- CHILLER
- ELECTRICAL SWITCH GEAR (2400V)
- AIR FAN

Dimensions and zones are indicated:

- 10'00" (vertical dimension)
- 42'00" (horizontal dimension)
- 12'00" EQUIPMENT ROOM DOOR (vertical dimension)
- 12'00" EQUIPMENT ROOM ACCESS DOOR (vertical dimension)
- 42'00" (horizontal dimension)
- AIR FAN
- MAXIMUM FOOTPRINT
- AIR FAN
- NON-ZONE EQUIPMENT ROOM
- AIR FAN

附件 2-1-4				
序号	部	项目	分值	考核内容
137		《福建省 2017 年度法治政府建设年度报告》	20.00	《福建省 2017 年度法治政府建设年度报告》
138		《福建省 2017 年度法治政府建设年度报告》	20.00	《福建省 2017 年度法治政府建设年度报告》
139		《福建省 2017 年度法治政府建设年度报告》	20.00	《福建省 2017 年度法治政府建设年度报告》
140		《福建省 2017 年度法治政府建设年度报告》	20.00	《福建省 2017 年度法治政府建设年度报告》

REPUBLIC NEVADA HAPKAK3000 INTERFACE LIST					
REF. NO.	INTERFACE	LOCATION (Easting, Northing)	TYPE	DESCRIPTION	
A	INLET - WATERSHED SUPPLY CULVERTION SUPPLY SEE SUPPLY DETAILS FOR 15' MIN. REQUIREMENTS	4.55 14.10	1.00	CONCRETE BOX 15' x 20' MIN. INLET ALUMINUM MANHOLE 15' DIA. 15' MIN. PRESSURE 40 PSI. 15' MIN. 15' DIA. PISTON 15' MIN.	
B	VENT - UPPER HOPPER	14.27 21.11	11.75	TRADE SIZE 12" (21") DUCTING	
C	VENT - LIQUID BIC	40.81 43.27	1.00	NPS 2" 300W NPS	
D	VENT - SOLID BIC	19.74 32.84	1.00	NPS 2" 300W NPS	
E	VENT - UPPER TRUNK	19.74 32.84	1.00	NPS 2" 300W NPS	
F	CLIMATE CONTROL WITH WIND ACCESS, DOW	30.44 13.00	1.00	1.00" ORBITAL OR 1.00" DIA.	
G	ELECTRIC SERVICE (FAN) MANHOLE CONNECT	30.44 13.00	1.00	ALUM. BOX 15' DIA. 15' MIN. 15' DIA. 15' MIN.	
H	INLET - AIR SUPPLY CULVERTION SUPPLY SEE SUPPLY DETAILS FOR 15' MIN. REQUIREMENTS	4.55 14.10	1.00	CONCRETE BOX 15' x 20' MIN. INLET ALUMINUM MANHOLE 15' DIA. 15' MIN. PRESSURE 40 PSI. 15' MIN. 15' DIA. PISTON 15' MIN.	
I	LIQUID DUCT - FUEL BRANKING	30.55 14.00	1.75	NPS 1" 300W NPS	
J	VENT - FUEL PURGE	40.71 14.00	1.00	NPS 1" 300W NPS	
K	VENT - VENT CONDENSING GAS CONDENSABLE	40.45 9.45	14.00	NPS 1" 300W NPS	

8-CluPheG, CuPhe, DOPAC

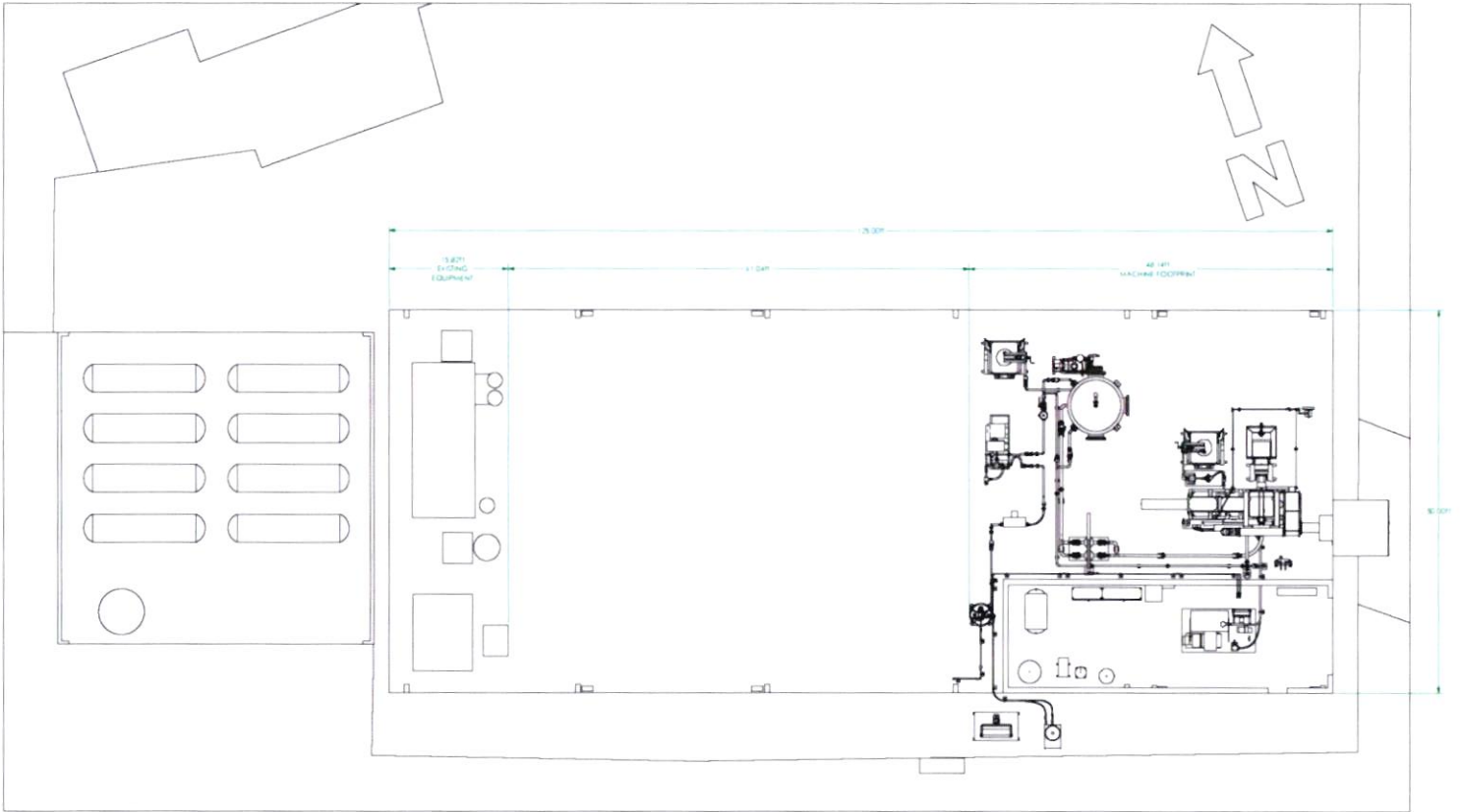
SHEET 1 OF

The drawing is the property of MacLean Engineering and Marketing Co., Ltd. and is loaned to the recipient for his confidential use only in connection with the design of the equipment. The recipient is not to make any reproduction of the drawing, the equipment drawings and any other drawings which may be used in any way detrimental to the interest of MacLean Engineering and Marketing Co., Ltd. and it shall be returned upon request, and shall not be reproduced, copied, loaned or otherwise disposed of directly or indirectly without the expressed written consent of MacLean Engineering and Marketing Co., Ltd.

[illegible]

D

FULL SITE - PLAN VIEW



ROUTING DATE 3/24

HAZOP - PLANT LAYOUT
REPUBLIC, NEVADA

HAZOP - PLANT LAYOUT
REPUBLIC, NEVADA
1288955 0.04

D

US ECOLOGY NEVADA, INC.
EQUIPMENT SPECIFICATIONS



HazPak 6000

HazPak 1500, 3000, 6000 & 6000+ Data Sheet

HazPak is a complete, turn-key system for the safe and proper disposal of aerosol cans and hazardous waste and is considered the best available technology in the industry. The HazPak processes one cubic meter batches of aerosol cans into three recyclable forms: densified metal briquettes (the cans), liquefied petroleum gas (the propellant), and liquid waste (the product).



UNRIVALED PERFORMANCE

HazPak processes batches of aerosols quickly, up to six cubic meters an hour, and safely using an inerting process that minimizes Nitrogen consumption.



LEAD THE WAY IN A GREEN ECONOMY

HazPak enables you to be a market leader in the Green Economy of landfill diversion with a well proven return on investment model and equips you to meet newly implemented or pending landfill diversion legislation.



MULTIPLE REVENUE STREAMS

HazPak aerosol densification and capture technology is the most effective and only proven technology available to separate and capture all three aerosol waste streams providing multiple potential revenue sources: Processing Fees, Scrap Value, and Fuel Sales.



OPTIONS

HazPak is offered in four models: 1500, 3000, 6000, and 6000+ to best suit your waste stream and throughput requirements. Base models come in defined layouts and configurations while customized versions can be engineered to meet customer requirements.

HazPak 1500**HazPak 3000****HazPak 6000****HazPak 6000+**

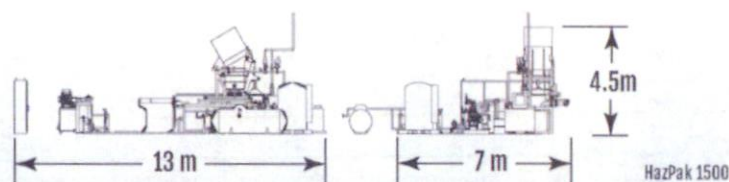
Aerosol Capacity (Post-Consumer ¹)	1.5 m ³ /hr 195–360 kg/hr	3 m ³ /hr 390–725 kg/hr	6 m ³ /hr 780–1450 kg/hr	6 m ³ /hr 780–1450 kg/hr
Aerosol Capacity (Pre-Consumer ²)	0.75 m ³ /hr 190–285 kg/hr	1 1/2 m ³ /hr 375–575 kg/hr	3 m ³ /hr 750–1150 kg/hr	6 m ³ /hr 1500–2325 kg/hr
Metal Recovered (Post-Consumer ¹)	100–160 kg/hr	210–320 kg/hr	420–630 kg/hr	420–630 kg/hr
Metal Recovered (Pre-Consumer ²)	50–80 kg/hr	100–160 kg/hr	210–320 kg/hr	420–630 kg/hr
Briquette Weight	5–10 kg	30–60 kg	30–60 kg	30–60 kg
Briquette Dimensions (Ø x L)	150 mm x 150 mm	318 mm x 200 mm	318 mm x 200 mm	318 mm x 200 mm
Liquid Recovered	Up to 225 kg/hr	Up to 425 kg/hr	Up to 850 kg/hr	Up to 1700 kg/hr
Gas Recovered ³	Up to 50 kg/hr	Up to 108 kg/hr	Up to 216 kg/hr	Up to 540 kg/hr
Voltage	Customer Specified			
Power Consumption	40 kW	80 kW	120 kW	160 kW
Nitrogen Consumption ⁴	5–9 m ³ /hr	9–18 m ³ /hr	12–24 m ³ /hr	12–24 m ³ /hr

Notes:1. Post-Consumer : 1m³ load to average 25% full cans.

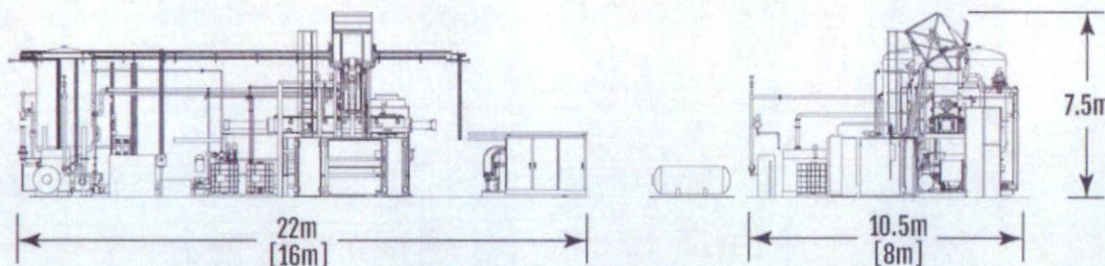
2. Pre-Consumer : 100% full cans.

3. Gas Recovered based on a gas density of 2.4kg/m³.

4. At standard conditions with Nitrogen purity of 98%.



HazPak 1500

HazPak 6000
[HazPak 3000]
macleanengineering.com
info@macleanengineering.com


Performance. Reliability. Innovation.

NUTEC

Design Association, Inc.
10000 West 10th Ave.
Suite 100
Westminster, CO 80040

JDB
ENGINEERING

10000 West 10th Ave.
Suite 100
Westminster, CO 80040

PROGRESS PRINT

TANK FARM
PIPE MODELING



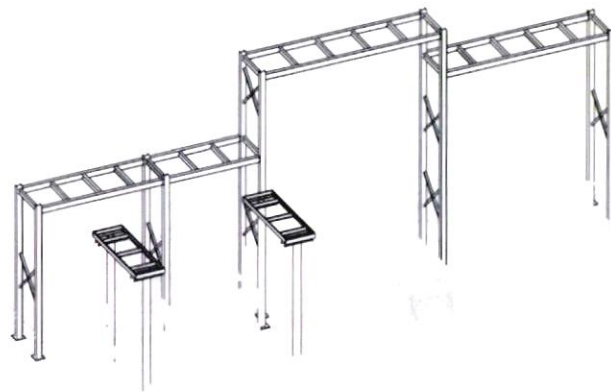
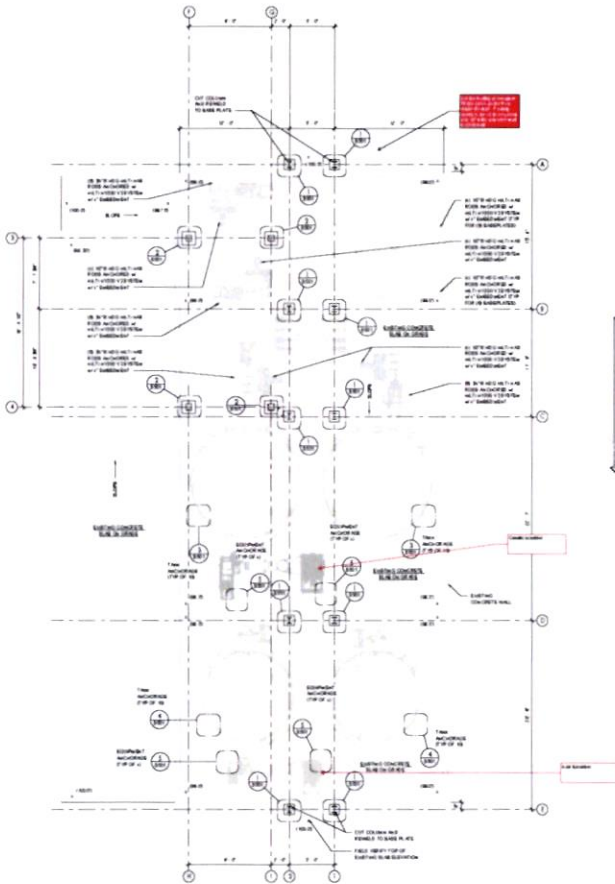
BEATTY, NEVADA

324164.00

FOUNDATION PLAN,
3D VIEW

S101

DATE: 01/11/2011



1. CONTAINMENT AREA FOUNDATION PLAN

- REVISIONS:
1. TOP OF FOUNDATION ELEVATION: 1000.00
 2. TOP OF FOUNDATION ELEVATION: 1000.00
 3. TOP OF FOUNDATION ELEVATION: 1000.00
 4. TOP OF FOUNDATION ELEVATION: 1000.00
 5. TOP OF FOUNDATION ELEVATION: 1000.00
 6. TOP OF FOUNDATION ELEVATION: 1000.00
 7. TOP OF FOUNDATION ELEVATION: 1000.00

US ECOLOGY NEVADA, INC.

SITE PLANS

(Boundary Coordinates and Building Parameter Information located in Application)

US ECOLOGY NEVADA, INC.

MAPS

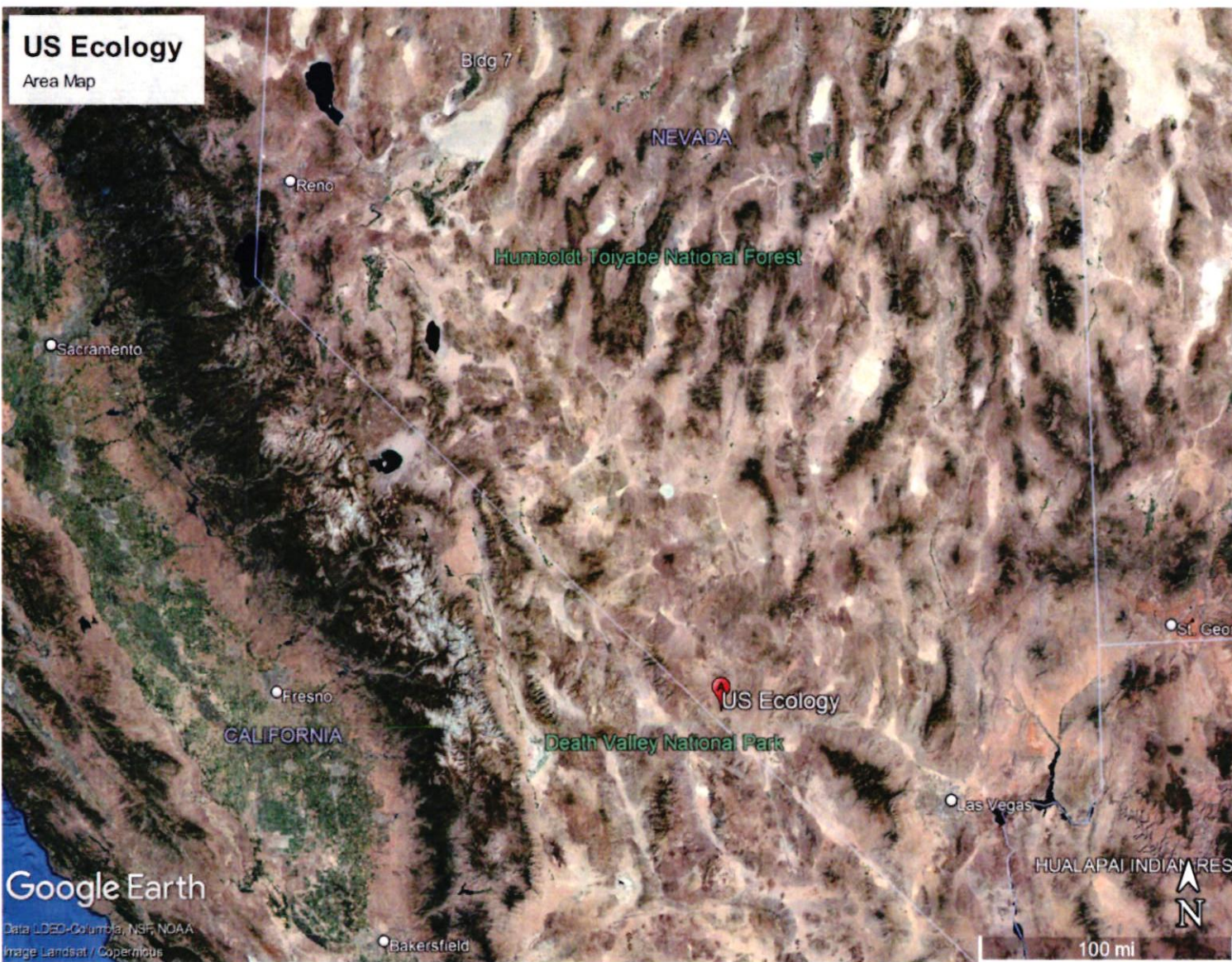
- VICINITY MAP

- FACILITY AREA MAP

(Boundary Coordinate Information located in Application)

US Ecology

Area Map



US Ecology

Vicinity Map



US ECOLOGY NEVADA, INC.
TANK FARM ACID/BASE NEUTRALIZATION SYSTEM
SOURCE TESTING

**SOURCE TEST REPORT
FOR VOC/HAP COMPLIANCE RETEST
AT US ECOLOGY NEVADA INC.**

Facility ID A0557

Permit No. AP4953-0184.05

**System 26a Scrubber #1 (S2.041, S2.042)
Tank Farm Acid/Base Neutralization System**

Re-test Date: June 2, 2026

Prepared for

US Ecology Nevada, Inc.
P.O. Box 578
Beatty, Nevada 89003

By

Broadbent & Associates, Inc.
8 West Pacific Avenue
Henderson, Nevada 89015
(702) 563-0600

Report Date: July 29, 2026

Project 25-09-142



TABLE OF CONTENTS

	<i>Page</i>
AETB Certification.....	v
Report Certification	vi
1.0 Introduction.....	1
1.1 Summary of Test Program	1
1.2 Test Program Organization	1
2.0 Source Description.....	2
2.1 System 26a, Tank Farm Acid/Base Neutralization System (S2.041, S2.042)	2
3.0 Test Program.....	3
3.1 Objectives.....	3
3.2 Test Matrix and Test Results.....	3
4.0 Flue Gas Sampling Locations	10
4.1 System 26a Scrubber #1	10
5.0 Sampling and Analysis Procedures.....	12
5.1 Continuous Monitoring – EPA Methods 3A and 25A	12
5.2 Flowrate and Moisture – EPA Methods 2/4.....	14
5.3 VOC and HAP Sampling – EPA Method 18 and TO-15	16
5.4 Process Data.....	16
6.0 Quality Assurance.....	17
6.1 Manual Sampling Equipment.....	17
6.2 Lab Analysis.....	17
6.3 QA/QC for Continuous Monitors.....	17

LIST OF FIGURES

1	Sampling Equipment at Test Location.....	10
2	System 26a, Scrubber #1 Sampling Location	11
3	Schematic of Broadbent Continuous Monitoring System.....	13
4	Schematic of EPA Method 2/4 Sampling Train.....	14
5	Schematic of EPA Method 18 Sampling Train.....	16

LIST OF TABLES

1	Project Organization	1
2	Summary of Measured Emissions Compared with Permit Limits	3
3	System 26a Test Matrix	3
4	Emission Data Summary – THC/VOC	4
5	Emission Data Summary – Organic HAP Scrubber 1	5

APPENDICES

Appendix A:	System 26a Scrubber 1 – Field Data, Lab Data, Calculations.....	A-1
Appendix B:	Plant Data	B-1
Appendix C:	Calibrations	C-1



Creating Solutions. Building Trust.

To Whom It May Concern:

The purpose of this letter is to attest to clients, regulatory agencies, and accreditation bodies the fact that as of May 09, 2025, Broadbent & Associates, Inc. (Broadbent) is an accredited Air Emission Testing Body (AETB), Accreditation Code 7478 01, that operates in conformance with *ASTM D7036-16 Standard Practice for Competence of Air Emission Test Bodies*.

Broadbent has in place and continually operates under a quality system meeting the relevant requirements. The current Broadbent Quality Manual and its implementation provide the system for ensuring year-to-year consistent and accurate air emission testing services for clients that meet their needs as well as the needs of the regulatory agencies to whom they report. Internal training, experience requirements, and external qualification exams ensure that a Qualified Stack Testing Individual (QSTI) / Qualified Individual (QI) is on-site for all test projects. As applicable, third-party proficiency testing programs are participated in to continually monitor the effectiveness of the quality system and to improve Broadbent's ability to deliver quality and reliable air emission testing services.

Broadbent collects quality system performance data which is accessible to clients, potential clients and regulatory authorities on request to confirm or recognize the competency of our AETB to perform air emission testing services.

Signed By: Scott McNulty
Mr. Scott McNulty
AETB Stack Testing Division Director

Signed By: Wayne Johnson
Mr. Wayne Johnson
AETB Quality Manager, QSTI

Signed By: M. Willinger
Mr. Marty Willinger
AETB Technical Manager

Environmental • Water Resources • Engineering

REPORT CERTIFICATION

I certify that all sampling and analytical procedures and data are of known and documented quality; all testing was conducted in accordance with the approved source test plan and applicable test methods; all testing details and data presented in this report are authentic, accurate and complete; and any test plan deviations or anomalies that occurred during the test program have been noted.



Wil Mercer
Field Team Leader



Jim Steiner
Data Reviewer / Report Writer

1.0 INTRODUCTION

At the request of US Ecology, Broadbent & Associates, Inc. (Broadbent) conducted emission tests on System 26a Tank Farm Acid/Base Neutralization System Scrubber #1 (S2.041, S2.042) located at US Ecology facility in Beatty, Nevada. The purpose of these tests was to determine VOC and HAP compliance with the Nevada Division of Environmental Protection (NDEP) Class II Air Quality Operating Permit No. AP4953-0184.05. **This was a retest.**

1.1 Summary of Test Program

Three 1-hour EPA Method 3A, 25A/18 and TO-15 tests were conducted for CO₂, O₂, VOC and organic HAP at the scrubber #1 outlet. System 26a was re-tested on June 2, 2026.

1.2 Test Program Organization

Table 1 presents the project organization.

Table 1. Project Organization

Task	Organization	Contact	
Responsible Official	US Ecology	Pierre-Luc Juteau	800.239.3943
Production Data Recording	US Ecology	Joanna Heath	775.380.0203
Project Management	Broadbent & Associates, Inc.	Wayne Johnson	702.563.0600
Source Testing	Broadbent & Associates, Inc.	Wil Mercer	702.563.0600
VOC/HAP Analysis	AtmAA, Inc.	Joe Lusker	818.223.3277

2.0 SOURCE DESCRIPTION

The US Ecology plant is a hazardous waste disposal facility. Solid waste is shipped to the site in bins, roll-off containers, or dump trucks. Liquid waste can be accepted in drums, totes, or tanker trucks. Once the waste has been processed it is land-filled for permanent disposal on-site.

2.1 System 26a Tank Farm Acid/Base Neutralization System (S2.041, S2.042)

System 26a consists of S2.041 and S2.042, which are two 17,110 gallon-caustic storage tank/waste acid neutralization reactor, Tanks T-1 and T-2. Emissions from S2.041 and S2.042 are ducted to a CECO Environmental HEE-Duall Brand counter-current packed bed scrubber (#1) fabricated from Type 2 PVC. The scrubber is designed to handle 1900 acfm of <120°F air at a pressure drop between 0 and 10.5 inches wg with a water recirculation rate of 21 gpm. The scrubber is equipped with a mesh pad to eliminate any droplet carryover. The scrubber controls emissions from the storage tanks to which waste acids from System 26b (S2.043 and S2.044) are added for neutralization.

3.0 TEST PROGRAM

3.1 Objectives

The primary purpose of this re-test was to demonstrate compliance with the VOC/HAP emission limits contained in the Air Quality Operating Permit No. AP4953-0184.05. The specific objectives were:

- Measure the concentrations of VOC and organic HAP emitted from scrubber #1.
- Obtain tank farm operating data during the test program.

3.2 Test Matrix and Results

Table 2 compares the measured emissions with the permit limits. Table 3 presents the test matrix for this retest. Scrubber 1 test results are summarized in Table 4. The organic HAP test results are in Table 5. During testing, tank pressures ranged from -0.08 to -0.18 in. wg. The fan speed was set to 1800 rpm and 5, 280 gallons of waste were treated. The stack gas temperature at the scrubber outlet averaged 75 °F vs a permit limit of 120 °F. Appendix B contains the plant data.

Table 2. Measured Emissions Compared with Permit Limits

Emission Unit	Emission	Measured (tons/yr)	Permitted (tons/yr)
System 26a Scrubber 1	VOC	0.12	--
	Organic HAP	0.02	0.32

Table 3. System 26a Retest Matrix

Emission Unit	Test Parameter	EPA Test Method	Test Date	Test Time	Run No.	Clock Time
System 26a Scrubber 1	Flowrate/Moisture O ₂ /CO ₂ , THC/VOC Organic HAP	2/4	6/2/26	1 hr.	1	11:03-12:08
		3A, 25A/18			2	14:03-15:08
		M18/TO-15			3	15:43-16:47

Table 4. Emission Data Summary – THC/VOC Scrubber 1

Run No.	1	2	3	Average
Date:	2-Jun-26	2-Jun-26	2-Jun-26	
Test Condition				
Barometric Pressure ("Hg)	26.95	27.00	26.95	26.97
Stack Pressure ("Hg)	26.97	27.02	26.97	26.99
Stack Area (ft ²)	0.79	0.79	0.79	0.79
Sampling Time (min.)	60.0	60.0	60.0	60.0
Volume Gas Sampled (dscf)	63.089	62.922	62.742	62.918
Gas Data				
Average Gas velocity (fps)	29.79	30.68	30.39	30.28
Average Gas Temperature (°F)	73.75	75.25	75.13	74.71
Gas Flowrate (dscfm)	1217	1256	1245	1239
Gas Analysis (Volume %)				
Carbon Dioxide	0.00	0.00	0.00	0.00
Oxygen	20.84	20.88	20.82	20.85
Water	2.74	2.47	2.26	2.49
Emission Concentration - ppm				
THC	24.49	21.50	25.60	23.87
>C ₂ HC	19.40	2.92	3.67	8.66
Emission Rate - lb/hr				
THC	0.074	0.067	0.080	0.074
>C ₂ HC	0.059	0.009	0.011	0.027
Emission Factor - tons/yr				
THC	0.33	0.30	0.35	0.32
>C ₂ HC	0.26	0.04	0.05	0.12

Table 5. Emission Data Summary – Organic HAP Scrubber 1

Run No.	1	2	3	Average
Date:	2-Jun-26	2-Jun-26	2-Jun-26	
Test Condition				
Barometric Pressure ("Hg)	26.95	27.00	26.95	26.97
Stack Pressure ("Hg)	26.97	27.02	26.97	26.99
Stack Area (ft ²)	0.79	0.79	0.79	0.79
Sampling Time (min.)	60.0	60.0	60.0	60.0
Volume Gas Sampled (dscf)	63.089	62.922	62.742	62.918
Gas Data				
Average Gas velocity (fps)	29.79	30.68	30.39	30.28
Average Gas Temperature (°F)	73.75	75.25	75.13	74.71
Gas Flowrate (dscfm)	1217	1256	1245	1239
Gas Analysis (Volume %)				
Carbon Dioxide	0.00	0.00	0.00	0.00
Oxygen	20.84	20.88	20.82	20.85
Water	2.74	2.47	2.26	2.49
Concentration (ppbv)				
Freon 12 (Dichlorodifluoromethane); CCl ₂ F ₂	< 2.63E+00	< 2.63E+00	< 2.63E+00	< 2.63E+00
Freon 114 (1,2-Dichlorotetrafluoroethane); CCl ₂ F ₄	< 1.88E+00	< 1.88E+00	< 1.88E+00	< 1.88E+00
Chloromethane; CH ₃ Cl	< 6.13E+00	< 6.13E+00	< 6.13E+00	< 6.13E+00
Vinyl chloride; C ₂ H ₃ Cl	< 5.00E+00	< 5.00E+00	< 5.00E+00	< 5.00E+00
1,3-Butadiene; C ₄ H ₆	< 5.75E+00	< 5.75E+00	< 5.75E+00	< 5.75E+00
Bromomethane; CH ₃ Br	< 3.25E+00	< 3.25E+00	< 3.25E+00	< 3.25E+00
Chloroethane; C ₂ H ₅ Cl	< 4.75E+00	< 4.75E+00	< 4.75E+00	< 4.75E+00
Freon 11 (Trichlorofluoromethane); CCl ₃ F	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
Freon 113 (1,1,2-Trichloro-1,2,2-trifluoroethane); C ₂ Cl ₃ F ₃	< 1.75E+00	< 1.75E+00	< 1.75E+00	< 1.75E+00
1,1-Dichloroethene; C ₂ H ₂ Cl ₂	< 3.25E+00	5.16E+00	< 3.25E+00	< 3.89E+00
Acetone; C ₃ H ₆ O	7.10E+02	4.46E+03	5.36E+03	3.51E+03
2-Propanol (Isopropyl Alcohol); C ₃ H ₈ O	2.00E+01	8.00E+01	1.00E+02	6.67E+01
Carbon Disulfide; CS ₂	7.00E+01	2.80E+02	1.60E+02	1.70E+02
Methylene Chloride (Dichloromethane); CH ₂ Cl ₂	1.30E+02	4.00E+01	3.00E+01	6.67E+01
Methyl Tert-Butyl Ether (MTBE); C ₅ H ₁₂ O	< 3.50E+00	< 3.50E+00	< 3.50E+00	< 3.50E+00
trans-1,2 Dichloroethene; C ₂ H ₂ Cl ₂	< 3.25E+00	< 3.25E+00	< 3.25E+00	< 3.25E+00
Hexane; C ₆ H ₁₄	< 3.63E+00	< 3.63E+00	< 3.63E+00	< 3.63E+00
1,1-Dichloroethane; C ₂ H ₄ Cl ₂	< 3.13E+00	< 3.13E+00	< 3.13E+00	< 3.13E+00
2-Butanone (Methyl Ethyl Ketone); C ₄ H ₈ O	< 4.38E+00	< 4.38E+00	< 4.38E+00	< 4.38E+00
cis-1,2-Dichloroethene; C ₂ H ₂ Cl ₂	< 3.25E+00	< 3.25E+00	< 3.25E+00	< 3.25E+00
Tetrahydrofuran; C ₄ H ₈ O	1.91E+01	9.58E+00	7.28E+00	1.20E+01
Chloroform; CHCl ₃	2.00E+01	4.00E+01	3.00E+01	3.00E+01
1,1,1-Trichloroethane; C ₂ H ₃ Cl ₃	< 2.38E+00	< 2.38E+00	< 2.38E+00	< 2.38E+00
Cyclohexane; C ₆ H ₁₂	8.66E+00	1.54E+01	9.41E+00	1.11E+01
Carbon Tetrachloride; CCl ₄	< 2.00E+00	< 2.00E+00	< 2.00E+00	< 2.00E+00

Continued next page

Table 5. Emission Data Summary – Organic HAP Scrubber 1 (Continued)

Run No.	1	2	3	Average
Concentration (ppbv, continued)				
Benzene; C ₆ H ₆	< 4.00E+00	< 4.00E+00	< 4.00E+00	< 4.00E+00
1,2-Dichloroethane; C ₂ H ₄ Cl ₂	< 3.13E+00	< 3.13E+00	< 3.13E+00	< 3.13E+00
Heptane; C ₇ H ₁₆	< 3.25E+00	< 3.25E+00	< 3.25E+00	< 3.25E+00
Trichloroethene; C ₂ HCl ₃	< 2.38E+00	< 2.38E+00	< 2.38E+00	< 2.38E+00
1,2-Dichloropropane; C ₃ H ₆ Cl ₂	< 3.50E+00	< 3.50E+00	< 3.50E+00	< 3.50E+00
1,4-Dioxane; C ₄ H ₈ O ₂	< 3.50E+00	< 3.50E+00	< 3.50E+00	< 3.50E+00
Bromodichloromethane; CHBrCl ₂	< 3.25E+00	< 3.25E+00	< 3.25E+00	< 3.25E+00
cis-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 2.88E+00	< 2.88E+00	< 2.88E+00	< 2.88E+00
4-Methyl-2-pentanone (Methyl Isobutyl Ketone); C ₆ H ₁₂ O	< 3.13E+00	< 3.13E+00	< 3.13E+00	< 3.13E+00
Toluene; C ₇ H ₈	< 3.38E+00	< 3.38E+00	< 3.38E+00	< 3.38E+00
trans-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 2.88E+00	< 2.88E+00	< 2.88E+00	< 2.88E+00
1,1,2-Trichloroethane; C ₂ H ₃ Cl ₃	< 2.50E+00	< 2.50E+00	< 2.50E+00	< 2.50E+00
Tetrachloroethene; C ₂ Cl ₄	< 1.88E+00	< 1.88E+00	< 1.88E+00	< 1.88E+00
2-Hexanone; C ₆ H ₁₂ O	< 3.13E+00	< 3.13E+00	< 3.13E+00	< 3.13E+00
Dibromochloromethane; CHBr ₂ Cl	< 1.75E+00	< 1.75E+00	< 1.75E+00	< 1.75E+00
1,2-Dibromoethane (EDB); C ₂ H ₄ Br ₂	< 1.88E+00	< 1.88E+00	< 1.88E+00	< 1.88E+00
Chlorobenzene; C ₆ H ₅ Cl	< 2.75E+00	< 2.75E+00	< 2.75E+00	< 2.75E+00
Ethyl Benzene; C ₈ H ₁₀	< 3.00E+00	< 3.00E+00	< 3.00E+00	< 3.00E+00
m,p-Xylene; C ₈ H ₁₀	< 3.00E+00	< 3.00E+00	< 3.00E+00	< 3.00E+00
o-Xylene; C ₈ H ₁₀	< 3.00E+00	< 3.00E+00	< 3.00E+00	< 3.00E+00
Styrene; C ₈ H ₈	< 3.00E+00	< 3.00E+00	< 3.00E+00	< 3.00E+00
Bromoform; CHBr ₃	< 1.50E+00	< 1.50E+00	< 1.50E+00	< 1.50E+00
1,1,2,2-Tetrachloroethane; C ₂ H ₂ Cl ₄	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
4-Ethyltoluene; C ₉ H ₁₂	< 2.75E+00	< 2.75E+00	< 2.75E+00	< 2.75E+00
1,3,5-Trimethylbenzene (Mesitylene); C ₉ H ₁₂	< 2.75E+00	< 2.75E+00	< 2.75E+00	< 2.75E+00
1,2,4-Trimethylbenzene; C ₉ H ₁₂	< 2.75E+00	< 2.75E+00	< 2.75E+00	< 2.75E+00
1,3-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
1,4-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
1,2-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
1,2,4-Trichlorobenzene; C ₆ H ₃ Cl ₃	< 1.88E+00	< 1.88E+00	< 1.88E+00	< 1.88E+00
Hexachlorobutadiene; C ₄ Cl ₆	< 1.50E+00	< 1.50E+00	< 1.50E+00	< 1.50E+00
Vinyl Acetate; C ₄ H ₆ O ₂	2.75E+01	< 3.63E+00	2.24E+01	< 1.78E+01
Ethyl Acetate; C ₄ H ₈ O ₂	< 3.50E+00	< 3.50E+00	< 3.50E+00	< 3.50E+00
Benzyl Chloride; C ₇ H ₇ Cl	< 2.25E+00	< 2.25E+00	< 2.25E+00	< 2.25E+00
Total All Cpds	4.18E+02	5.33E+02	4.02E+02	4.51E+02
Total Detected Cpds	2.75E+02	3.94E+02	2.65E+02	3.11E+02

NOTE: HAPS were quantified by GCMS using EPA TO-15 procedures (±30% calibration criteria). Acetone, isopropyl alcohol, methylene chloride, carbon disulfide, and chloroform made up 90% of the HAPS and were quantified by GC-FID using EPA M18 (±5% calibration criteria). All HAPS concentrations **were increased by 25%** to account for the different calibration criteria. The highlighted compounds are not considered to be HAPs and are not included in the total.

Continued next page

Table 5. Emission Data Summary – Organic HAP Scrubber 1 (Continued)

Run No.	1	2	3	Average
Emission Rate (lb/hr)				
Freon 12 (Dichlorodifluoromethane); CCl ₂ F ₂	< 6.03E-05	< 6.22E-05	< 6.17E-05	< 6.14E-05
Freon 114 (1,2-Dichlorotetrafluoroethane); CCl ₂ F ₄	< 6.07E-05	< 6.27E-05	< 6.21E-05	< 6.19E-05
Chloromethane; CH ₃ Cl	< 5.86E-05	< 6.05E-05	< 6.00E-05	< 5.97E-05
Vinyl chloride; C ₂ H ₃ Cl	< 5.92E-05	< 6.11E-05	< 6.06E-05	< 6.03E-05
1,3-Butadiene; C ₄ H ₆	< 5.90E-05	< 6.08E-05	< 6.03E-05	< 6.00E-05
Bromomethane; CH ₃ Br	< 5.85E-05	< 6.04E-05	< 5.98E-05	< 5.96E-05
Chloroethane; C ₂ H ₅ Cl	< 5.81E-05	< 5.99E-05	< 5.94E-05	< 5.91E-05
Freon 11 (Trichlorofluoromethane); CCl ₃ F	< 5.86E-05	< 6.05E-05	< 5.99E-05	< 5.97E-05
Freon 113 (1,1,2-Trichloro-1,2,2-trifluoroethane); C ₂ Cl ₃ F ₃	< 6.22E-05	< 6.41E-05	< 6.36E-05	< 6.33E-05
1,1-Dichloroethene; C ₂ H ₂ Cl ₂	< 5.97E-05	9.79E-05	< 6.11E-05	< 7.29E-05
Acetone; C ₃ H ₆ O	7.82E-03	5.07E-02	6.04E-02	3.96E-02
2-Propanol (Isopropyl Alcohol); C ₃ H ₈ O	2.28E-04	9.41E-04	1.17E-03	7.78E-04
Carbon Disulfide; CS ₂	1.01E-03	4.17E-03	2.36E-03	< 2.51E-03
Methylene Chloride (Dichloromethane); CH ₂ Cl ₂	2.09E-03	6.65E-04	4.94E-04	1.08E-03
Methyl Tert-Butyl Ether (MTBE); C ₅ H ₁₂ O	< 5.85E-05	< 6.04E-05	< 5.98E-05	< 5.96E-05
trans-1,2 Dichloroethene; C ₂ H ₂ Cl ₂	< 5.97E-05	< 6.16E-05	< 6.11E-05	< 6.08E-05
Hexane; C ₆ H ₁₄	< 5.92E-05	< 6.11E-05	< 6.06E-05	< 6.03E-05
1,1-Dichloroethane; C ₂ H ₄ Cl ₂	< 5.86E-05	< 6.05E-05	< 6.00E-05	< 5.97E-05
2-Butanone (Methyl Ethyl Ketone); C ₄ H ₈ O	< 5.98E-05	< 6.17E-05	< 6.12E-05	< 6.09E-05
cis-1,2-Dichloroethene; C ₂ H ₂ Cl ₂	< 5.97E-05	< 6.16E-05	< 6.11E-05	< 6.08E-05
Tetrahydrofuran; C ₄ H ₈ O	2.61E-04	1.35E-04	1.02E-04	1.66E-04
Chloroform; CHCl ₃	4.53E-04	9.34E-04	6.94E-04	6.94E-04
1,1,1,-Trichloroethane; C ₂ H ₃ Cl ₃	< 6.01E-05	< 6.20E-05	< 6.14E-05	< 6.12E-05
Cyclohexane; C ₆ H ₁₂	1.38E-04	2.53E-04	1.54E-04	1.82E-04
Carbon Tetrachloride; CCl ₄	< 5.83E-05	< 6.02E-05	< 5.96E-05	< 5.94E-05
Benzene; C ₆ H ₆	< 5.92E-05	< 6.11E-05	< 6.06E-05	< 6.03E-05
1,2-Dichloroethane; C ₂ H ₄ Cl ₂	< 5.86E-05	< 6.05E-05	< 6.00E-05	< 5.97E-05
Heptane; C ₇ H ₁₆	< 6.17E-05	< 6.37E-05	< 6.31E-05	< 6.29E-05
Trichloroethene; C ₂ HCl ₃	< 5.92E-05	< 6.10E-05	< 6.05E-05	< 6.02E-05
1,2-Dichloropropane; C ₃ H ₆ Cl ₂	< 7.50E-05	< 7.74E-05	< 7.67E-05	< 7.63E-05
1,4-Dioxane; C ₄ H ₈ O ₂	< 5.85E-05	< 6.03E-05	< 5.98E-05	< 5.95E-05
Bromodichloromethane; CHBrCl ₂	< 1.01E-04	< 1.04E-04	< 1.03E-04	< 1.03E-04
cis-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 6.05E-05	< 6.24E-05	< 6.19E-05	< 6.16E-05
4-Methyl-2-pentanone (Methyl Isobutyl Ketone); C ₆ H ₁₂ O	< 5.93E-05	< 6.12E-05	< 6.07E-05	< 6.04E-05
Toluene; C ₇ H ₈	< 5.89E-05	< 6.08E-05	< 6.03E-05	< 6.00E-05
trans-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 6.05E-05	< 6.24E-05	< 6.19E-05	< 6.16E-05
1,1,2-Trichloroethane; C ₂ H ₃ Cl ₃	< 6.32E-05	< 6.52E-05	< 6.47E-05	< 6.44E-05
Tetrachloroethene; C ₂ Cl ₄	< 5.89E-05	< 6.08E-05	< 6.03E-05	< 6.00E-05
2-Hexanone; C ₆ H ₁₂ O	< 5.93E-05	< 6.12E-05	< 6.07E-05	< 6.04E-05
Dibromochloromethane; CHBr ₂ Cl	< 6.91E-05	< 7.13E-05	< 7.07E-05	< 7.04E-05
1,2-Dibromoethane (EDB); C ₂ H ₄ Br ₂	< 6.68E-05	< 6.89E-05	< 6.83E-05	< 6.80E-05
Chlorobenzene; C ₆ H ₅ Cl	< 5.87E-05	< 6.06E-05	< 6.00E-05	< 5.97E-05

Continued next page

Table 5. Emission Data Summary – Organic HAP Scrubber 1 (Continued)

Run No.	1	2	3	Average
Emission Rate (lb/hr)				
Ethyl Benzene; C ₈ H ₁₀	< 6.04E-05	< 6.23E-05	< 6.18E-05	< 6.15E-05
m,p-Xylene; C ₈ H ₁₀	< 6.04E-05	< 6.23E-05	< 6.17E-05	< 6.15E-05
o-Xylene; C ₈ H ₁₀	< 6.04E-05	< 6.23E-05	< 6.17E-05	< 6.15E-05
Styrene; C ₈ H ₈	< 5.92E-05	< 6.11E-05	< 6.06E-05	< 6.03E-05
Bromoform; CHBr ₃	< 7.19E-05	< 7.42E-05	< 7.35E-05	< 7.32E-05
1,1,2,2-Tetrachlorethane; C ₂ H ₂ Cl ₄	< 7.16E-05	< 7.39E-05	< 7.32E-05	< 7.29E-05
4-Ethyltoluene; C ₉ H ₁₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,3,5-Trimethylbenzene (Mesitylene); C ₉ H ₁₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,2,4-Trimethylbenzene; C ₉ H ₁₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,3-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,4-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,2-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 6.27E-05	< 6.47E-05	< 6.41E-05	< 6.38E-05
1,2,4-Trichlorobenzene; C ₆ H ₃ Cl ₃	< 6.45E-05	< 6.66E-05	< 6.60E-05	< 6.57E-05
Hexachlorobutadiene; C ₄ Cl ₆	< 7.41E-05	< 7.65E-05	< 7.58E-05	< 7.55E-05
Vinyl Acetate; C ₄ H ₆ O ₂	4.49E-04	< 6.10E-05	3.73E-04	< 2.94E-04
Ethyl Acetate; C ₄ H ₈ O ₂	< 5.85E-05	< 6.03E-05	< 5.98E-05	< 5.95E-05
Benzyl Chloride; C ₇ H ₇ Cl	< 5.40E-05	< 5.57E-05	< 5.52E-05	< 5.50E-05
Total All Cpds	7.33E-03	9.27E-03	7.17E-03	7.93E-03
Total Detected Cpds	4.40E-03	6.26E-03	4.18E-03	4.95E-03
Emission Rate (ton/yr)				
Freon 12 (Dichlorodifluoromethane); CCl ₂ F ₂	< 2.64E-04	< 2.72E-04	< 2.70E-04	< 2.69E-04
Freon 114 (1,2-Dichlorotetrafluoroethane); CCl ₂ F ₄	< 2.66E-04	< 2.75E-04	< 2.72E-04	< 2.71E-04
Chloromethane; CH ₃ Cl	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
Vinyl chloride; C ₂ H ₃ Cl	< 2.59E-04	< 2.68E-04	< 2.65E-04	< 2.64E-04
1,3-Butadiene; C ₄ H ₆	< 2.58E-04	< 2.66E-04	< 2.64E-04	< 2.63E-04
Bromomethane; CH ₃ Br	< 2.56E-04	< 2.64E-04	< 2.62E-04	< 2.61E-04
Chloroethane; C ₂ H ₅ Cl	< 2.54E-04	< 2.63E-04	< 2.60E-04	< 2.59E-04
Freon 11 (Trichlorofluoromethane); CCl ₃ F	< 2.57E-04	< 2.65E-04	< 2.62E-04	< 2.61E-04
Freon 113 (1,1,2-Trichloro-1,2,2-trifluoroethane); C ₂ Cl ₃ F ₃	< 2.72E-04	< 2.81E-04	< 2.78E-04	< 2.77E-04
1,1-Dichloroethene; C ₂ H ₂ Cl ₂	< 2.62E-04	4.29E-04	< 2.68E-04	< 3.19E-04
Acetone; C ₃ H ₆ O	3.42E-02	2.22E-01	2.64E-01	1.74E-01
2-Propanol (Isopropyl Alcohol); C ₃ H ₈ O	9.98E-04	4.12E-03	5.10E-03	3.41E-03
Carbon Disulfide; CS ₂	4.43E-03	1.83E-02	1.03E-02	1.10E-02
Methylene Chloride (Dichloromethane); CH ₂ Cl ₂	9.17E-03	2.91E-03	2.16E-03	4.75E-03
Methyl Tert-Butyl Ether (MTBE); C ₅ H ₁₂ O	< 2.56E-04	< 2.64E-04	< 2.62E-04	< 2.61E-04
trans-1,2 Dichloroethene; C ₂ H ₂ Cl ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04
Hexane; C ₆ H ₁₄	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
1,1-Dichloroethane; C ₂ H ₄ Cl ₂	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
2-Butanone (Methyl Ethyl Ketone); C ₄ H ₈ O	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.67E-04
cis-1,2-Dichloroethene; C ₂ H ₂ Cl ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04

Continued next page

Table 5. Emission Data Summary – Organic HAP Scrubber 1 (Concluded)

Run No.	1	2	3	Average
Emission Rate (ton/yr)				
Tetrahydrofuran; C ₄ H ₈ O	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
Chloroform; CHCl ₃	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
1,1,1,-Trichloroethane; C ₂ H ₃ Cl ₃	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.67E-04
Cyclohexane; C ₆ H ₁₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04
Carbon Tetrachloride; CCl ₄	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
Benzene; C ₆ H ₆	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
1,2-Dichloroethane; C ₂ H ₄ Cl ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.67E-04
Heptane; C ₇ H ₁₆	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04
Trichloroethene; C ₂ HCl ₃	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
1,2-Dichloropropane; C ₃ H ₆ Cl ₂	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
1,4-Dioxane; C ₄ H ₈ O ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.67E-04
Bromodichloromethane; CHBrCl ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04
cis-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
4-Methyl-2-pentanone (Methyl Isobutyl Ketone); C ₆ H ₁₂ O	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
Toluene; C ₇ H ₈	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.67E-04
trans-1,3-Dichloropropene; C ₃ H ₄ Cl ₂	< 2.62E-04	< 2.70E-04	< 2.68E-04	< 2.66E-04
1,1,2-Trichloroethane; C ₂ H ₃ Cl ₃	< 2.59E-04	< 2.68E-04	< 2.65E-04	2.64E-04
Tetrachloroethene; C ₂ Cl ₄	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.61E-04
2-Hexanone; C ₆ H ₁₂ O	< 2.60E-04	< 2.68E-04	< 2.66E-04	< 2.65E-04
Dibromochloromethane; CHBr ₂ Cl	< 3.03E-04	< 3.12E-04	< 3.10E-04	< 3.08E-04
1,2-Dibromoethane (EDB); C ₂ H ₄ Br ₂	< 2.92E-04	< 3.02E-04	< 2.99E-04	< 2.98E-04
Chlorobenzene; C ₆ H ₅ Cl	< 2.57E-04	< 2.65E-04	< 2.63E-04	< 2.62E-04
Ethyl Benzene; C ₈ H ₁₀	< 2.64E-04	< 2.73E-04	< 2.70E-04	< 2.69E-04
m,p-Xylene; C ₈ H ₁₀	< 2.64E-04	< 2.73E-04	< 2.70E-04	< 2.69E-04
o-Xylene; C ₈ H ₁₀	< 2.64E-04	< 2.73E-04	< 2.70E-04	< 2.69E-04
Styrene; C ₈ H ₈	< 2.59E-04	< 2.68E-04	< 2.65E-04	< 2.64E-04
Bromoform; CHBr ₃	3.15E-04	< 3.25E-04	< 3.22E-04	< 3.20E-04
1,1,2,2-Tetrachlorethane; C ₂ H ₂ Cl ₄	< 3.14E-04	< 3.24E-04	< 3.21E-04	< 3.19E-04
4-Ethyltoluene; C ₉ H ₁₂	< 2.74E-04	< 2.83E-04	< 2.81E-04	< 2.79E-04
1,3,5-Trimethylbenzene (Mesitylene); C ₉ H ₁₂	< 2.74E-04	< 2.83E-04	< 2.81E-04	< 2.79E-04
1,2,4-Trimethylbenzene; C ₉ H ₁₂	< 2.74E-04	< 2.83E-04	< 2.81E-04	< 2.79E-04
1,3-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.75E-04	< 2.83E-04	< 2.81E-04	< 2.80E-04
1,4-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.75E-04	< 2.83E-04	< 2.81E-04	< 2.80E-04
1,2-Dichlorobenzene; C ₆ H ₄ Cl ₂	< 2.75E-04	< 2.83E-04	< 2.81E-04	< 2.80E-04
1,2,4-Trichlorobenzene; C ₆ H ₃ Cl ₃	< 2.82E-04	< 2.91E-04	< 2.89E-04	< 2.88E-04
Hexachlorobutadiene; C ₄ Cl ₆	< 3.25E-04	< 3.35E-04	< 3.32E-04	< 3.31E-04
Vinyl Acetate; C ₄ H ₆ O ₂	1.97E-03	< 2.67E-04	1.64E-03	< 1.29E-03
Ethyl Acetate; C ₄ H ₈ O ₂	< 2.56E-04	< 2.64E-04	< 2.62E-04	< 2.61E-04
Benzyl Chloride; C ₇ H ₇ Cl	< 2.36E-04	< 2.44E-04	< 2.42E-04	< 2.41E-04
Total All Cpds	3.21E-02	4.06E-02	3.14E-02	3.47E-02
Total Detected Cpds	1.81E-02	2.68E-02	1.79E-02	2.09E-02

4.0 FLUE GAS SAMPLING LOCATIONS

4.1 System 26a, Scrubber #1

Figure 1 is a photograph of the sampling equipment. A zoom boom was used to accommodate the stack tester and equipment at the sampling location.

System 26a Scrubber #1 has a 12-inch diameter vertical stack, which was extended by 12 feet (see Figure 2). Two 4-inch male NPT test ports were installed at 90° to meet the 8-diameter downstream and 2-diameter upstream rule for Method 1A.

Eight sampling points (4 per traverse, 2 traverses, 7.5 minutes per point) were used for measurement of flowrate, and moisture. O₂ and CO₂ were measured by EPA Method 3A at a single point.



Figure 1. Sampling Equipment at Test Location



Figure 2. System 26a, Scrubber #1 Sampling Location.

5.0 SAMPLING AND ANALYSIS PROCEDURES

5.1 Continuous Monitoring – EPA Methods 3A and 25A

Figure 3 is a schematic of the Broadbent continuous emissions monitoring system (CEMS). The procedures used to continuously monitor stack gases for CO₂, O₂, and THC strictly follow EPA Methods 3A, and 25A. EPA Method 205, EPA Protocol high-concentration supply gases, and an Environics Model 2020 gas dilution system are used to generate the calibration gases for each of the analyzers. The performance of the gas dilution system is evaluated prior to the tests in accordance with Section 3.2 of Method 205. Once the gas dilution system passes the evaluation, the analyzer used for the check is audited using an EPA Protocol mid-level supply gas. If this audit is successful, the gas dilution system is then used to generate individual calibration gases.

Prior to the test program, the CEMS is assembled and leak checked. The sample probe is sealed with a cap and the flow through each rotameter is observed. The leak check is successful if the pressure at the analyzer system and the flow through the rotameters all drop to zero. A leak check of the entire CEMS is performed before and after each test to ensure no leaks occurred during movement of the sample probe from port to port.

High-level EPA Protocol calibration gases for CO₂, O₂ and THC are introduced into each analyzer to calibrate the analyzer and recorder. Once these adjustments are completed, the analyzer calibration error checks are performed. Zero, mid-level, and high-level calibration gases are introduced to the gas analyzers. No adjustments are made to the system except what is necessary to achieve the proper calibration gas flowrate. The analyzer responses to the calibration gases are recorded by the STRATA data acquisition system (DAS). When calibration gas is introduced directly to each analyzer, the difference between the analyzer display and the known concentration of each calibration gas must not exceed 2.0% of the span gas concentration.

Next, the sampling system bias check is performed by introducing calibration gases at the sample probe. A zero gas and a mid-level or high-level calibration gas, whichever most closely approximates the stack gas concentrations, is used for this check. No adjustments are made to the system except those necessary to achieve the proper calibration gas flowrate. At the same time, the measurement system response time (95% of gas value) is determined for both the zero and upscale gases. The sampling system bias check is valid if the difference between the gas concentrations for the analyzer calibration error check and the sampling system bias check does not exceed 5.0% of the span gas concentration.

A sample is taken from the stack at a single point (since the gases are well-mixed having passed through the scrubber fan) using a heated 316 stainless steel sampling probe. A heated Headline filter holder and a fiberglass filter (99.9999 percent efficiency retention of 0.6-micron particles) are connected to the outlet of the probe. Sample gas is transported through heated Teflon sample line (maintained at $>250^{\circ}\text{F}$) by a Teflon-lined diaphragm pump to a Kynar and Teflon chiller (Universal Analyzers Model 1060). The sample gas passes through the chiller under vacuum before entering the pump. The clean, dry sample gas (approximately 37°F) is then transported to the continuous analyzer system through an unheated Teflon line. A series of flow meters, valves, and regulators maintain constant flow through the system at a constant pressure. A separate sample is taken from the heated line, before the chiller, and sent directly to the FID for THC measurement (wet basis).

The continuous analyzers are calibrated with EPA Protocol calibration gases. The DAS recorded pertinent data such as date, time, test locations, analyzer range, and calibration gas value. At the end of each run, the zero and upscale sampling system bias checks are repeated. Zero drift and calibration drift are determined by calculating the difference between the initial and final calibration response for the zero and upscale gases. In either case, the drift must be $\leq 3.0\%$ of the span gas concentration to be acceptable. The sampling system bias check must be $\leq 5.0\%$ of the span gas concentration to be valid. The measured gas concentrations are corrected for sampling system bias in accordance with Section 12 equation 7E-5b of EPA Method 7E.

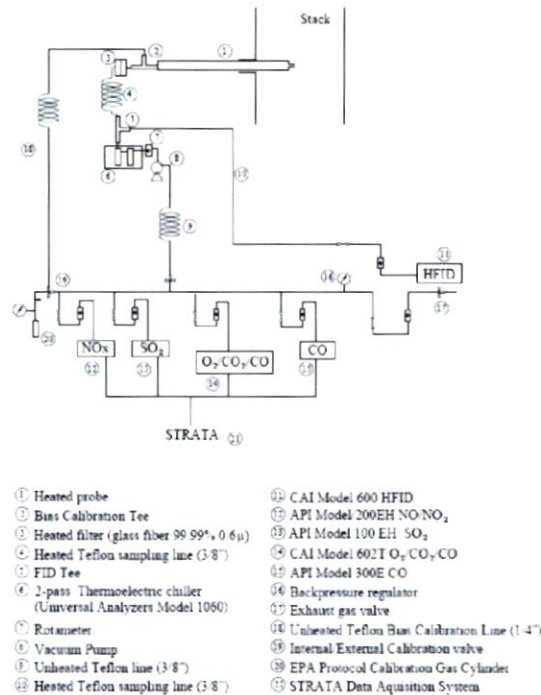


Figure 3. Schematic of Broadbent Continuous Monitoring System.

5.2 Flowrate and Moisture – EPA Method 2/4

5.2.1 Preparation of the Flowrate/H₂O Sampling Train

Sampling train components are cleaned in the laboratory (soap and water, tap water rinse, distilled water rinse, and IPA rinse). The sampling train components are sealed and transported to the sampling site in a mobile lab. The EPA Method 2/4 equipment (Figure 4) used to measure moisture and flowrate consists of:

- A straight 316 stainless steel nozzle for constant sampling rate
- A miniature stainless steel S-type pitot tube and a thermocouple to measure stack velocity, pressure, and temperature
- A 15-foot Teflon line to connect the outlet of the probe to the inlet of the sampling train
- A Pyrex glass impinger train in an ice bath (impingers 1 and 2 contain 100-ml distilled water; bubbler 3 is dry; bubbler 4 contains a weighed amount of silica gel)
- An umbilical to connect the probe and sample box to the control module
- A control module containing a vacuum pump, a calibrated dry gas meter and a calibrated orifice meter to measure the pressure, temperature, and flowrate throughout the train.

The sampling train is charged in the mobile lab and each charged impinger is weighed to the nearest 0.1 gm on a calibrated electronic balance. The sampling point locations are marked on the probe and assembled and lifted to the sampling site.

5.2.2 Sampling Procedures for Flowrate/H₂O Sampling Train

Prior to a test run, the sampling train is heated and leak checked at 15-inches Mercury to ensure leakage is less than 0.02. The S-type pitot tube is also leak checked. The sampling probe is installed in the sample port and the probe is inserted into the stack at the farthest point. A constant sampling rate is calculated for each sampling point on the traverse (4 points per traverse; 2 traverses at 90°). Each point is sampled for an equal period and all pertinent data are recorded for each point. The probe is maintained at stack temperature throughout the traverse. The gases leaving the impinger train are maintained at <68°F. At the end of a traverse, the probe is withdrawn from the stack and the train is transferred to the next sampling port. Another traverse of the stack is completed and the probe is withdrawn for the final leak check, performed at 15 inches Mercury or at the highest vacuum achieved during the test. The S-type pitot tube is also checked at this time. The impinger train is sealed and lowered to the mobile lab for sample recovery.

5.2.3 Sample Recovery Procedures for Flowrate/H₂O Train

Sample recovery occurs in the mobile lab. Each impinger is removed from the ice bath, wiped dry and weighed to the nearest 0.1 gm. The contents of impingers 1, 2 and 3 are discarded. The sampling train is then recharged in preparation for the next test.

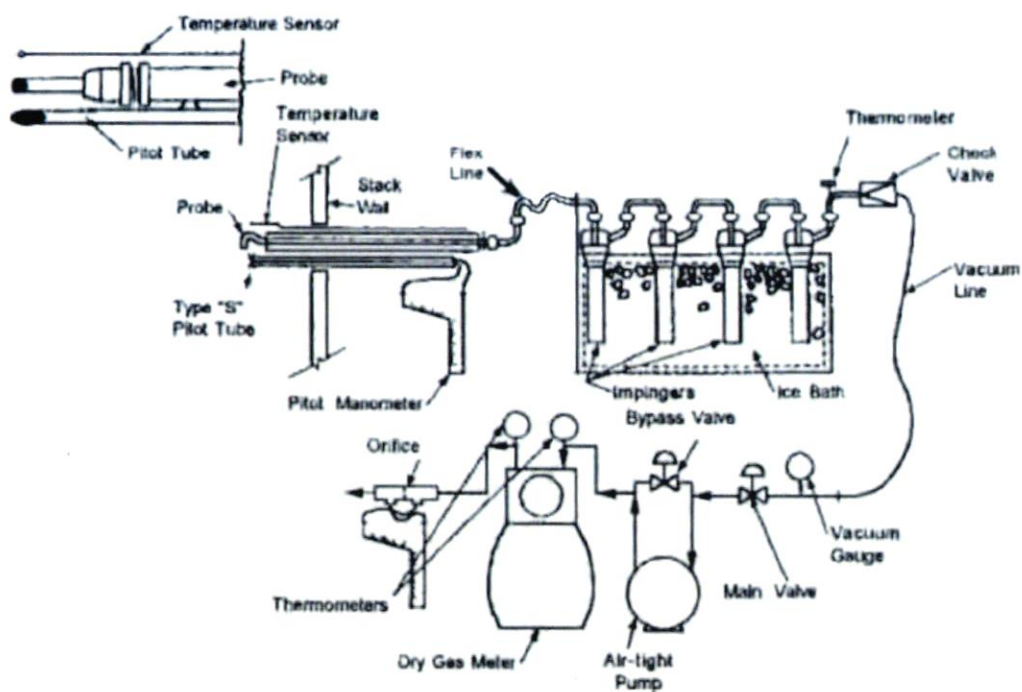


Figure 4. Schematic of EPA Method 2/4 Sampling Train.

5.3 VOC and HAP – EPA Method 18 and TO-15

A gas sample is withdrawn from the scrubber outlet duct at a constant rate into an evacuated, 3-liter, Mylar FlexFoil bag (Figure 5). VOC concentration is determined by separating and quantifying C_1 , C_2 , and $>C_2$ using GC-FID in accordance with EPA Method 18 analysis procedures. The individual HAPs from the bag are separated by GC and measured by full scan mass spectroscopy. The bag samples are analyzed following the protocols established in EPA Method TO-15. The individual HAPs making up $>90\%$ of the total HAPs are quantified by GC-FID using EPA Method 18 and the 10% remaining HAPs concentrations are increased by 25% for reporting purposes to account for the differences in calibration accuracy between Method 18 and TO-15. This procedure has been approved by NDEP for measuring VOC/HAPs on Systems 19 and 21 in place of EPA Method 320.

5.3 Process Data

The process data collected by US Ecology personnel is in Appendix B.

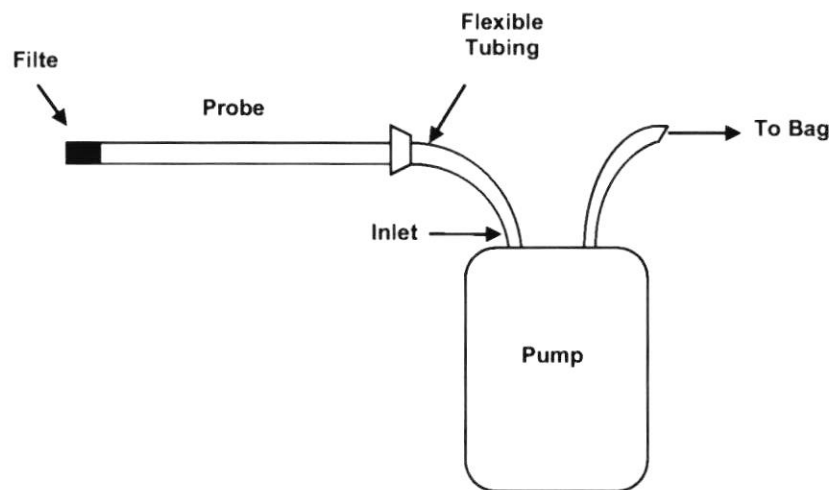


Figure 5. Schematic of EPA Method 18 Sampling Train.

6.0 QUALITY ASSURANCE

6.1 Manual Sampling Equipment

A detailed record of repair and maintenance to each sampling train is kept. System preventive maintenance is performed periodically to avoid component failure during a field test. Calibration records for sampling nozzles, pitot tubes, dry gas meters, and orifice meters are available for review. The calibration data for the equipment used on this program are in the appendix of this report.

6.2 Lab Analysis

Field samples are assigned an ID number, which is affixed to the sample container, the chain-of-custody log, and field data sheet to eliminate sample mix-up. Prior to analysis, all glassware is thoroughly cleaned in accordance with the methods. The dishes used for sample evaporation are treated the same as a sample (oven dried, desiccated, and weighed repeatedly at 6-hour intervals until a constant weight is achieved). The glassware used for volume measurement, transfers and dilutions are NIST Class A to ensure accurate measurements.

All weights are carried out on an Ohaus Discovery 5-place analytical balance supported by a marble table in a separate room from the main analytical laboratory. The balance is calibrated regularly against NIST Class S1 weights. Reagents used in the field and in the laboratory are ACS reagent grade and blanks of these reagents are evaluated for every set of tests. Blanks are taken in the field from the squeeze bottles and not the original container. Records are kept on these blanks to ensure consistent quality of the reagents.

6.3 QA/QC for Continuous Monitors

EPA Method 205 also requires a field evaluation of the gas dilution system once during each field test using a calibrated analyzer and high range EPA Protocol supply gas. Two dilutions (20% and 60%) within the range of each mass flow controller are selected and triplicate injections of the dilution gas are injected into the calibrated analyzer. For each injection made at each of the dilution levels, an individual injection cannot differ by >2% from the three-injection average. In addition, the three-injection average at each dilution level cannot differ by >2% from predicted concentration of the gas dilution system.

Finally, EPA Method 205 requires an independent check of the gas dilution system using a mid-level EPA Protocol supply gas. The audit gas is injected directly into the analyzer three times. The three injection average cannot differ by >2% from the certified gas concentration. The results of the checks performed on the Broadbent CEMS during the test program are in Appendix C.

US ECOLOGY NEVADA, INC.
ENVIRONMENTAL EVALUATION

NOT REQUIRED