STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1016-AOP-R15 AFIN: 10-00004

1. PERMITTING AUTHORITY:

Division of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Elemental Environmental Solutions LLC
500 East Reynolds Road
Arkadelphia, Arkansas 71923

3. PERMIT WRITER:

Christopher Riley

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Hazardous Waste Treatment and Disposal
NAICS Code: 562211

5. ALL SUBMITTALS:

The following is a list of ALL permit applications included in this permit revision.

Date of Application	Type of Application (New, Renewal, Modification, Deminimis/Minor Mod, or Administrative Amendment)	Short Description of Any Changes That Would Be Considered New or Modified Emissions
6/10/2020	Modification	New kiln (SN-40)
2/10/2021	Minor Mod	New stabilization tank (SN-32 and 39)

6. REVIEWER'S NOTES:

Elemental Environmental Solutions LLC (EES) operates a spent potliner thermal treatment process at its facility located in Gum Springs, Arkansas. The facility has submitted a modification to add a new incinerator (SN-40) and request for bubbled annual emissions for SN-19 and SN-40. Facility has also submitted a minor modification to add a stabilization tank to SN-32 (Stabilization Operation) and rename the source (previously Steel Bunker Mixing). The permitted emissions increases are 15.0 tpy of PM and PM_{10}, 3.9 tpy CO, 6.88 tpy Single Organic HAP, 4.33 tpy of Bromine, and 0.02 tpy each of Manganese, Antimony, Nickel, and Cobalt.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

This facility was last inspected August 12, 2020. The only area of concern listed in that inspection letter involved the AWFCO system and alarms being tested, and the results recorded, per Plantwide Condition 50.

8. PSD/GHG APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N
If yes, were GHG emission increases significant? N

b) Is the facility categorized as a major source for PSD? N
- *Single pollutant ≥ 100 tpy and on the list of 28 or single pollutant ≥ 250 tpy and not on list*

If yes for 8(b), explain why this permit modification is not PSD.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
01, 02, 05, 06, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 21, 22, 23, 24, 25, 26, and 27	PM_{10}	CAM
Facility	All	NESHAP 40 C.F.R. § 63 Subpart EEE
32	HAPs	NSPS 40 C.F.R. § 60 Subpart IIII
33	HAPs	NESHAP 40 C.F.R. § 63 Subpart ZZZZ
19	NO_X, CO & O_2	CEMs
34	HAPs	NESHAP 40 C.F.R. § 63 Subpart DD
37	Benzene	40 CFR 61 Subpart FF
40	CO, O_2, SO2 and NO_X	CEMS

10. UNCONSTRUCTED SOURCES:

Unconstructed Source	Permit Approval Date	Extension Requested Date	Extension Approval Date	If Greater than 18 Months without Approval, List Reason for Continued Inclusion in Permit
NA				

11. PERMIT SHIELD – TITLE V PERMITS ONLY:

Did the facility request a permit shield in this application? Y
(Note - permit shields are not allowed to be added, but existing ones can remain, for minor modification applications or any Regulation 18 requirement.)

If yes, are applicable requirements included and specifically identified in the permit? Y
If not, explain why.

For any requested inapplicable regulation in the permit shield, explain the reason why it is not applicable in the table below.

Source	Inapplicable Regulation	Reason
19	40 C.F.R. 64 CAM Rule	Subject to MACT (NESHAP 40 C.F.R. § 63 Subpart EEE) which governs emissions monitoring requirements.
19	NSPS 40 C.F.R. § 60 Subpart E	The facility is used exclusively for the incineration of hazardous wastes
19	NSPS 40 C.F.R. § 60 Subpart F	These units superficially resemble cement kilns but are not engaged in the manufacture of Portland cement.
Facility	NSPS 40 C.F.R. § 60 Subpart OOO	Spent potliner is not a “nonmetallic mineral” since the majority of the SPL is carbon material.
Facility	NESHAP 40 C.F.R. § 60 Subpart C	The facility does not meet the definition of “incinerator” as specified in Section 61.31(h)

12. COMPLIANCE ASSURANCE MONITORING (CAM) – TITLE V PERMITS ONLY:

List sources potentially subject to CAM because they use a control device to achieve compliance and have pre-control emissions of at least 100 percent of the major source level. List the pollutant of concern and a brief summary of the CAM plan (temperature monitoring, CEMs, opacity monitoring, etc.) and frequency requirements of § 64.

Source	Pollutant Controlled	Cite Exemption or CAM Plan Monitoring and Frequency
01, 05-16, 18, 20-27	PM/PM_{10}	5 opacity exceedances in any 6 month period
19	all	COM limit for more than two consecutive hours, operates outside the range of Continuous Pressure Differential Reading, or fails two consecutive stack tests

13. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

14. AMBIENT AIR EVALUATIONS:

The following are results for ambient air evaluations or modeling.

a) NAAQS

A NAAQS evaluation is not required under the Arkansas State Implementation Plan, National Ambient Air Quality Standards, Infrastructure SIPs and NAAQS SIP per Ark. Code Ann. § 8-4-318, dated March 2017 and the DEQ Air Permit Screening Modeling Instructions.

b) Non-Criteria Pollutants:

The non-criteria pollutants listed below were evaluated. Based on Division of Environmental Quality procedures for review of non-criteria pollutants, emissions of all other non-criteria pollutants are below thresholds of concern.

1st Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Division of Environmental Quality has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m^3), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Ammonia	17.41	1.92	15.98	N
Arsenic Compounds	0.01	0.0011	2.42E-02	N

Pollutant	TLV (mg/m^3)	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Beryllium Compounds	0.002	2.2E-04	0.0244	N
Cadmium Compounds	0.01	0.0011	0.0501	N
Chlorine	1.45	0.1595	29.5	N
Chromium Compounds	0.01	0.0011	0.0259	N
Fluorides	2.5	0.275	3.73	N
Hydrochloric Acid (Hydrogen Chloride)	2.98	0.3278	29.69	N
Mercury	0.025	0.00275	0.032	N
Polycyclic Aromatic Hydrocarbons	0.2	0.022	0.7112	N
Lead	0.05	0.0055	0.0523	N
Ethylbenzene	86.8	9.55	0.286	Y
Methanol	262.08	28.82	1.682	Y
Phenol	19.25	2.11	0.00334	Y
Styrene	85.2	9.37	0.1681	Y
Toluene	75.36	8.29	0.354	Y
Bromine	0.6536	0.0718	4.46	N
Selenium	0.2	0.022	0.5	N
Benzene	0.1	0.011	0.06	Y
Antimony	0.5	0.055	0.005	Y
Cobalt	0.02	0.0022	0.005	N
Manganese Compounds	0.2	0.022	0.005	Y
Nickel Compounds	1.5	0.165	0.005	Y

2nd Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Division of Environmental Quality to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL ($\mu g/m^3$) = 1/100 of Threshold Limit Value	Modeled Concentration ($\mu g/m^3$)	Pass?
Ammonia	200-Annual 3200-1 Hour	4.37=Annual 254.3=1 Hour	Y
Arsenic Compounds	0.1	0.00184	Y
Beryllium Compounds	0.02	0.00199	Y
Cadmium Compounds	0.1	0.00373	Y
Chlorine	14.5	1.72089	Y
Chromium Compounds	0.1	0.00394	Y
Fluorides	25.0	5.06056	Y
Hydrochloric Acid (Hydrogen Chloride)	29.8	1.87946	Y
Mercury	0.25	0.00196	Y
Polycyclic Aromatic Hydrocarbons	2.0	0.12571	Y
Lead	0.5	0.00418	Y
Bromine	6.536	0.47529	Y
Selenium	2.0	0.00361	Y
Cobalt	0.2	0.00085	Y
Manganese Compounds	2	0.00038	Y

c) H_2S Modeling:

A.C.A. §8-3-103 requires hydrogen sulfide emissions to meet specific ambient standards. Many sources are exempt from this regulation, refer to the Arkansas Code for details.

Is the facility exempt from the H_2S Standards Y
If exempt, explain: No Emissions

Pollutant	Threshold value	Modeled Concentration (ppb)	Pass?
H_2S	20 parts per million (5-minute average*)		
	80 parts per billion (8-hour average) residential area		
	100 parts per billion (8-hour average) nonresidential area		

*To determine the 5-minute average use the following equation

$Cp = Cm\ (t_m/t_p)^{0.2}$ where

Cp = 5-minute average concentration
Cm = 1-hour average concentration
t_m = 60 minutes
t_p = 5 minutes

15. CALCULATIONS:

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
01, 02, 05, 06, 26, 27, 30, 31	Grain Loading	0.002 gr/acf	Baghouse	99.9%	
07, 08, 09, 10, 11, 12, 13, 14, 15, 16,	Grain Loading	0.005 gr/acf	Baghouse	99.9%	

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
18, 20, 21, 22, 23, 24, 25					
19 and 40	MACT EEE Limits, Stack Testing (SO_2), and Waste Analysis for VOC	SO_2 Max %: 4.0 Max Flow= 15 gal/min SO_2= (0.24 lb SO_2/lb S)(510 lb S supplied/hr)= 122.4 lb/hr SO_2= 241.1 tpy NO_X testing showed max to be much lower (29.62 lb/hr & 129.7 tpy) than permitted, but leaving it the same as last permit.	Afterburner Baghouse	99.9% 99.9%	Throughput higher than 20tph, SO_2= 0.18 lb SO_2/lb S Less than = 0.24
32	AP-42 11.19.2 MSDS AP-42 3.3	Operation lb/ton Screen=0.072 Crusher=0.015 Loading/Unloading= 0.0004 Conveyor= 0.0077 2nd Cut = 0.1% Sodium Beryllium Fluoride Based on Molecular Weight Ratio PM= 0.31 lb/MMBtu PM_{10}= 0.31 lb/MMBtu SO_2= 0.29 lb/MMBtu VOC= 0.36 lb/MMBtu	Primary Screen= Baghouse Crusher= Building Loading/Unloading= Baghouse Conveyor (7 drop off pts)= building	99.9% 80% 99.9% 80%	Portable Baghouse is 190HP Diesel Engine operated 8,760 hr/yr

SN	Emission Factor Source (AP-42, testing, etc.)	Emission Factor (lb/ton, lb/hr, etc.)	Control Equipment	Control Equipment Efficiency	Comments
		CO= 0.95 lb/MMBtu NO_X= 4.41 lb/MMBtu			
33	AP-42 Chapter 3.3 for Combustion	lb/MMBtu PM=0.31 PM_{10}=0.31 SO_2=0.29 VOC=0.36 CO=0.95 NO_X=4.41	None	N/A	Calculated at 1,000 hours of operation per year
34	Table 2-9, 2-11 of EPA "Protocol for Equipment Leak & Emission Estimates" Nov, 1995		None	N/A	Max VOC Concentration 500 ppmv Light Liquid Valves= 42 Light Liquid Pumps= 14 Connectors= 112
35	Tanks Program	Organic Fuel Max throughput= 10,512,000 gal/yr Worst Case= 30% throughput Methyl Alcohol	Tank Vent	99%	(2)- 50,000 Gallon and (4)- 24,000 gallon Tanks
36	AP-42 Table 11.19.2	Max throughput = 200,000 ton/yr 0.0085 lb PM/ton 0.0035 lb PM_{10}/ton	None	N/A	Half of PM assumed to be PM_{10}
38		PM/PM_{10} 0.01 grains/DSCF Dioxin/Furan 1.05E-10 wt%			

16. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
19	EEE	EEE See Plantwide		
19	SO_2	6C		
19	Average VOHAP concentration for off-site material streams	Sampling, Method 305 in 40 CFR part 63, Method 25D in 40 CFR part 60, Method 624 in 40 CFR part 136, Method 625 in 40 CFR part 136, Method 1624 in 40 CFR part 136, Method 1625 in 40 CFR part 136, Method 8260 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992, or Method 8270 in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986,		

SN	Pollutants	Test Method	Test Interval	Justification
		as amended by Update I, November 15, 1992		

17. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
19	Various AFS systems	CEM	Continuous	N
19	CO Concentration	CEM	Continuous	N
19	PM Concentration	COM	Continuous	N
19	NO_X Concentration	CEM	Continuous	N
40	Various AFS systems	CEM	Continuous	N
40	CO Concentration	CEM	Continuous	N
40	PM Concentration	COM	Continuous	N
40	NO_X Concentration	CEM	Continuous	N
40	SO_2 Concentration	CEM	Continuous	N

18. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Permit Limit	Frequency	Report (Y/N)
33	Maintenance/Malfunction	N/A	Monthly	N
33	Hours of Operation	1,000 Hours per year	Monthly	N

19. OPACITY:

SN	Opacity	Justification for limit	Compliance Mechanism
32, 38	5%	§18.501	Inspector Observation
01, 05, 06, 09, 10, 11, 18, 20, 21, 22, 26, 27	7%	CAM	Weekly
07, 08, 12, 13, 14, 15, 16, 23, 24, 25	10%	CAM	Weekly
19 and 40	20%	Guidance	Continuous
33	20%	Guidance	Inspector Observation

20. DELETED CONDITIONS:

Former SC	Justification for removal
None	

21. GROUP A INSIGNIFICANT ACTIVITIES:

The following is a list of Insignificant Activities including revisions by this permit.

Source Name	Group A Category	Emissions (tpy)						
		PM/PM_{10}	SO_2	VOC	CO	NO_x	HAPs	
							Single	Total
Five Diesel Fuel Storage Tanks 4000, 2 @ 3000, 2000, and 1000 gallon capacity.	3							0.002
Gasoline Storage Tanks #1 and #2 (SN-28)	3			0.34				
Laboratory Dust Collector and Vent	5	0.0001						
Lime Handling Fugitives (SN-29)	13	0.003						
Cooling Tower	13	0.22						
Cooler Conveyor Dust Collector	13	0.0001						
Leachate Tanks	13			0.0001				
Loading Silos	13	PM= 0.19 PM_{10}=0.0						

		9						
Air Duct Systems	13	0.0001						
Initial Size Reduction System	13	0.0001						
Loadout Inline Dust Collector (SN-31)	13	0.19					7.44e-5	2.65e-4
Hot Water Heater #1	13	0.05	0.05	0.06	0.15	0.66	5.24e-4	7.16e-4
Hot Water Heater #2	13	0.05	0.05	0.05	0.14	0.14	4.76e-4	2.23e-3
Drum Sampling	13			0.7			0.7	0.7
Total	**13**	**0.7033**	**0.1**	**0.8101**	**0.29**	**0.80**	**0.702**	**0.705**

22. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

The following is a list of all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1016-AOP-R14

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

Fee Calculation for Major Source

Revised 03-11-16

Facility Name: EES
Permit Number: 1016-AOP-R15
AFIN: 10-00004

$/ton factor	23.93	Annual Chargeable Emissions (tpy)	884.49
Permit Type	Modification	Permit Fee $	1000

Minor Modification Fee $	500
Minimum Modification Fee $	1000
Renewal with Minor Modification $	500
Check if Facility Holds an Active Minor Source or Minor Source General Permit	☐
If Hold Active Permit, Amt of Last Annual Air Permit Invoice $	0
Total Permit Fee Chargeable Emissions (tpy)	15
Initial Title V Permit Fee Chargeable Emissions (tpy)	

HAPs not included in VOC or PM: *Chlorine, Hydrazine, HCl, HF, Methyl Chloroform, Methylene Chloride, Phosphine, Tetrachloroethylene, Titanium Tetrachloride*

Air Contaminants: *All air contaminants are chargeable unless they are included in other totals (e.g., H2SO4 in condensible PM, H2S in TRS, etc.)*

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
PM		50.5	65.5	15	15	65.5
PM_{10}		49.9	64.9	15		
$PM_{2.5}$		0	0	0		
SO_2		243	243	0	0	243
VOC		53.5	53.5	0	0	53.5
CO		105.9	109.8	3.9		
NO_X		245.7	245.7	0	0	245.7
Lead	☐	0.21	0.21	0		

Pollutant (tpy)	Check if Chargeable Emission	Old Permit	New Permit	Change in Emissions	Permit Fee Chargeable Emissions	Annual Chargeable Emissions
Arsenic Compounds	☐	0.0861	0.0861	0		
Beryllium Compounds	☐	0.0865	0.0865	0		
Cadmium Compounds	☐	0.21	0.21	0		
Chlorine	☑	100.18	100.18	0	0	100.18
Hydrochloric Acid	☑	100.18	100.18	0	0	100.18
Chromium Compounds	☐	0.0901	0.0901	0		
Dioxin and Furans	☐	8.43E-07	8.43E-07	0		
Fluorides	☑	6.49	6.49	0	0	6.49
Mercury	☐	0.11	0.11	0		
PAH	☐	2.9829	2.9832	0.0003		
Bromine	☐	7.29	11.62	4.33		
Selenium	☐	0.21	0.21	0		
Ammonia	☑	69.94	69.94	0	0	69.94
Single Organics	☐	4.76	11.64	6.88		
Total Other Organics	☐	50.76	50.76	0		
Benzene	☐	0.26	0.26	0		
Antimony	☐	0	0.02	0.02		