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March 16, 2021

Texas Commission on Environmental Quality
Air Permits Initial Review Team, MC 161
12100 Park 35 Circle
Building C, Third Floor
Austin, Texas 78753

RE: Initial Case-by-Case Minor NSR Application
Zinc Resources, LLC
Victoria EAF Dust Recycling Plant

Dear Madam or Sir:

On behalf of Zinc Resources, LLC (Zinc Resources), please find enclosed a Case-by-Case Minor New Source Review (NSR) application for a proposed electric arc furnace (EAF) dust recycling plant located in Victoria, Victoria County, Texas (Recycling Plant). Zinc Resources has been assigned Customer Reference Number (CN) CN605840602 and Regulated Entity Number (RN) 105630461.

Zinc Resources is requesting that the application fee for voided Project No. 322923 be applied to this application. Zinc Resources is requesting this application be processed as an expedited application and has included Form APD-EXP, as required.

If you have any questions regarding the information in this submittal, please give me a call at (361) 883-1668 ext. 2753.

Sincerely,

TRINITY CONSULTANTS

AJ Hansborough
Manager of Consulting Services – Corpus Christi

Enclosures

cc: Mr. Ron Crittendon, Zinc Resources, LLC
Mr. Tom Knepper, Zinc Resources, LLC

TCEQ AIR QUALITY NSR PERMIT APPILCATION

Zinc Resources LLC

EAF Dust Recycling Plant / Victoria, TX

Prepared By:

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March 2021

Project 204403.0021

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1.0 EXECUTIVE SUMMARY

Zinc Resources LLC (Zinc Resources) is proposing to install a greenfield EAF Steel Dust Recycling Plant in Victoria County, Texas (Recycling Plant). Victoria County is currently designated as an attainment or unclassified area for all criteria pollutants[1]. Zinc Resources proposes to permit this project under the Texas Commission on Environmental Quality (TCEQ) New Source Review (NSR) program. The Recycling Plant will be a minor source with respect to Prevention of Significant Deterioration (PSD) and Federal Operating Permit (Title V) programs.

Zinc Resources has been assigned a TCEQ Customer Reference Number (CN) 605840602 and Regulated Entity Reference Number (RN) 105630461 for the Recycling Plant.

1.1 Introduction

Zinc Resources is proposing to construct an EAF Recycling Plant utilizing one Waelz Kiln (FIN: KILN-1) to produce Waelz Zinc Oxide (WZO) and Waelz Iron Product (WIP) from Electric Arc Furnace (EAF) dust generated at steel mini mills. An associated building with baghouse (FIN: BH-1, BH-2, BH-3, and BH-4), bin vent filters (FIN: BVF 1-2), aggregate handling operations (FIN: WIP1 – WIP3), emergency generator (FIN: EMGEN1), and a diesel tank (FIN: T1) are present as part of the process.

EAF dust is a listed hazardous waste with waste code K061. Zinc Resources will not store the EAF dust prior to processing. The processing begins with wetting immediately upon transfer from incoming trucks or railcars to promote hydration of the lime and blending for zinc and slag chemistry. The recycling process itself is not subject to permitting under the Resource Conservation and Recovery Act (RCRA). Facilities utilizing exempt recycling processes which do not store incoming hazardous wastes prior to treatment are not required to obtain a RCRA permit.

All required supporting documentation for the permit amendment is provided in this application. Applicant information is submitted as part of Core Data Form and PI-1 workbook in Appendix A and B. The area maps indicating the site location, modelled sources, and downwash structures are provided in Section 2. A facility plot plan, process flow diagram and description is provided in Section 3. Emission calculation methodology is discussed in Section 4. Best Available Control Technology (BACT) is discussed in Section 5. State and Federal regulations are discussed in Section 6. Modeling and Health Effects review is discussed in Section 7. Detailed emission calculations are provided in Appendix C. Equipment forms are provided in Appendix D. Electronic Modeling Evaluation Workbook (EMEW) is provided in Appendix E.

1.2 Background

Zinc-coated galvanized steel scrap is the most widely used feedstock for Electric Arc Furnace (EAF) steel production. During the EAF process, the high temperatures required to melt the feed material produce a zinc byproduct (EAF dust) that leaves the furnace along with the off-gases. The gases are filtered and the EAF dust is collected in baghouses. The EAF dust generated by steel mills can be recycled in an economically viable way using the Waelz Kiln technology. The recycling process is part of the larger steel industry loop that allows the reuse of two important natural resources - zinc and iron.

[1] Source: https://www3.epa.gov/airquality/greenbook/ancl.html, EPA data current as of March 15, 2021

Waelz Zinc Oxide is the main product of recycling EAF dust utilizing the Waelz Kiln technology. This product is sold to zinc smelters as an alternative to traditional zinc concentrates from mines. The zinc smelters produce pure zinc ingots or other high purity zinc products that are either sold to the steel industry for galvanization purposes or sold to other end-users for pigments, tires, chemicals or medicines.

1.3 Emissions Summary

A complete emissions listing by Emission Point Number (EPN) and pollutants can be found in the Unit Types – Emission Rates tab as part of the PI-1 Form.

Table 1. Proposed Emission Summary

Pollutant	Proposed Short Term (lb/hr)	Proposed Long Term (tpy)
NOx	23.10	61.04
CO	28.50	99.76
SO_2	1.71	7.44
VOC	4.12	10.71
PM	6.72	27.55
PM_{10}	6.52	26.93
$PM_{2.5}$	6.37	26.45
CO_2	38,616.78	164,170.83
CH_4	0.21	0.73
N_2O	0.75	3.23
CO_2e	38,844.69	165,152.02
Pb	0.12	0.53
HAPs	1.72	1.87

2.0 AREA MAPS

The Recycling Plant will be located in Victoria County, TX. An area map is included in this section to graphically depict the location of the facility with respect to the surrounding topography. Figure 2-1 depicts the fenceline/property line with respect to predominant geographic features (such as highways, roads, streams, and railroads) along with a buffer that extends out at least 3,000 feet from the property line in all directions. There are no schools within 3,000 feet of the proposed facility boundary. Figure 2-2 depicts the modeled sources and downwash structures.

Zinc Resources - EAF Dust Recycling Facility - 3000 ft Area Map

Coordinate System: NAD 1983 UTM Zone 14N

Revision Date: March 12, 2021 1105

0 162.5 325 650 975 Meters

Legend

- Property Line
- 3000 ft Buffer

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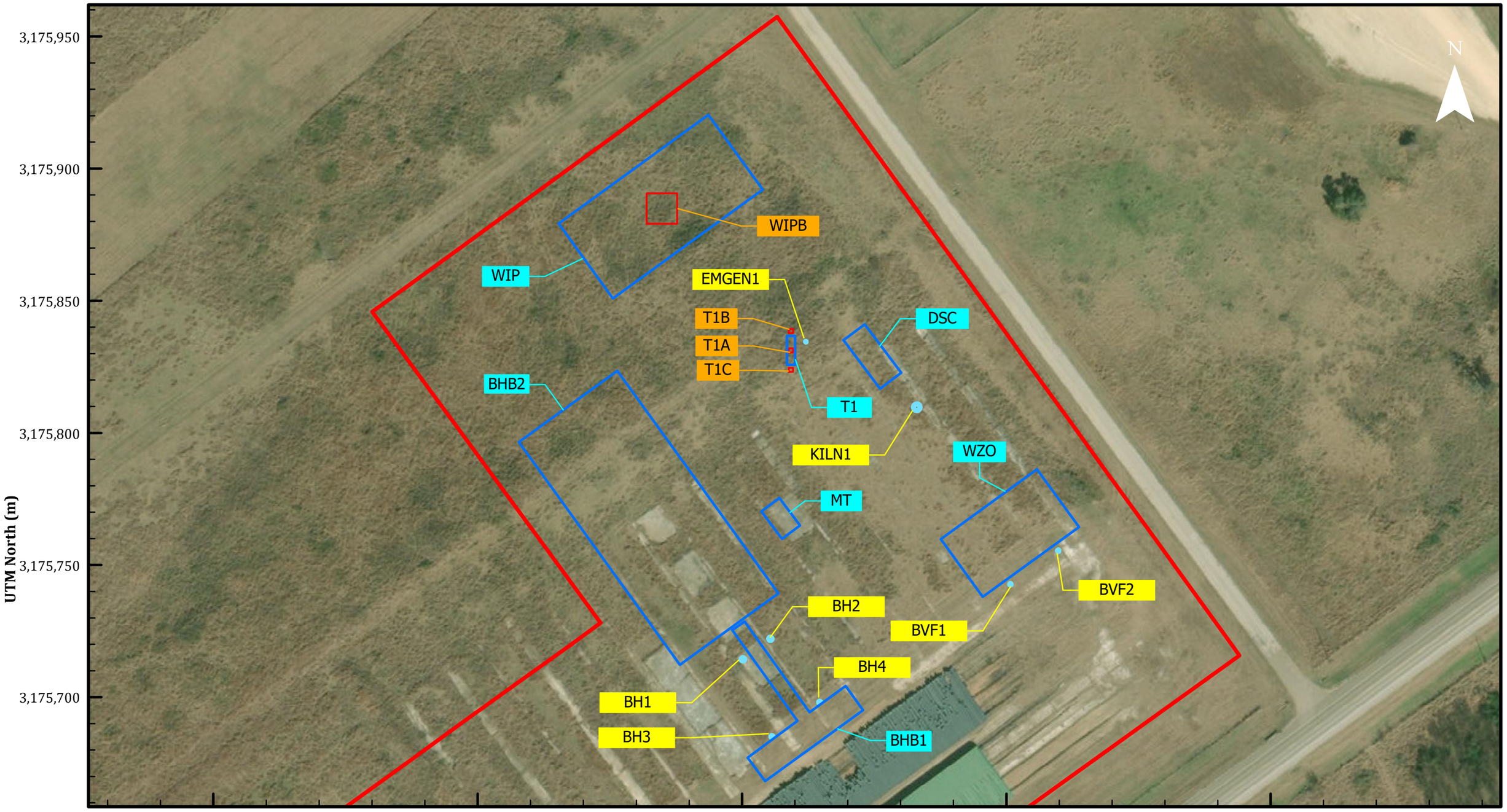
Zinc Resources - EAF Dust Recycling Facility - Location of Modeled Sources and Downwash Structures



3.0 PROCESS DESCRIPTION AND PROCESS FLOW DIAGRAM

The following section provides a process flow diagram and process description for the operations at the proposed Recycling Plant.

3.1 Process Description

Hydration, Blending and Pelletizing

The process begins with EAF dust in covered hopper bottom railcars, which is shipped and discharged into the Conditioning, Blending and Pelletizing building and hydrated. The EAF dust falls through the rail tracks and water is sprayed into the building which begins the process by hydrating the lime in the EAF dust making it suitable for blending and pelletizing. The building (EPN: BH-1, BH-2, BH-3, and BH-4) is completely enclosed and under negative pressure which ensures that there are no emissions to the outside of the building. The Hydrated Zinc Feed is then analyzed and moved into staging boxes depending on analysis for subsequent blending by payloader. After blending, the Hydrated Zinc Feed is fed to the high intensity mixer/pelletizer.

Carbon is added and used as a reductant in the Waelzing reaction. Lime is also added and is used to control slag chemistry in the kiln. Proper slag chemistry prevents accretions in the kiln and maximizes zinc recovery. All the charge materials are received and held until the mixer/pelletizer is ready to process the next batch.

Waelzing

Waelzing is the thermal processing of the feed material to produce WZO and WIP. WZO is a crude zinc oxide containing about 60 percent zinc. Its primary use is in zinc smelters as a substitute for mined zinc concentrates in the production of primary zinc metal. It can also be further processed by calcining and used in the production of American Process Zinc Oxide. WZO is the primary product of the EAF Dust Recycling Plant. The secondary product, WIP, is primarily used as an Iron source in Cement kilns in the production of Portland cement.

The process has no waste materials, and no process water is released into the environment. The Waelzing process begins when the kiln feed the Conditioning, Blending and Pelletizing Building on a conveyor belt which is totally enclosed in a steel containment tube and travels to the kiln feeding pipe. The conveyor belt discharge and feeding pipe are in an airtight enclosure on the top of the Dust Settling Chamber.

The kiln feed travels down the feeding pipe into the Waelz Kiln. The Waelz Kiln is heated by a natural gas burner at the discharge end of the kiln. As the material travels toward the discharge end of the Waelz Kiln their temperature increases until the zinc reduction reaction begins. Metallic vapor travels through the reducing atmosphere of the bed of the kiln generated by the trim carbon into the freeboard of the kiln above the bed. The freeboard of the kiln has an oxygen rich atmosphere, and the metallic zinc vapor burns back into zinc oxide and is entrained in the gas stream. After the zinc in the bed is fully reduced, the remaining bed material, which is WIP, discharges from the kiln into the Cooling Drum. After cooling, the WIP is discharged from the Cooling Drum and transported to the WIP Building by payloader or belt conveyor (EPN: WIP1 and EPN: WIP2). The stored WIP from the WIP Building is then transported to the truck (EPN: WIP3).

Air enters the discharge end of the Cooling Drum and is preheated as it cools the WIP. It then travels up into the discharge end of the kiln where it is further heated by the Burner if necessary. Although the primary purpose of the burner is to heat up the rotary kiln to operating temperature after an outage (startup), it is also used as necessary to trim the heat in the kiln. Since the reactions in the kiln are thermally balanced with the zinc reduction reaction needing energy and the reoxidation in the kiln freeboard giving the energy back, little additional heat is required during this process.

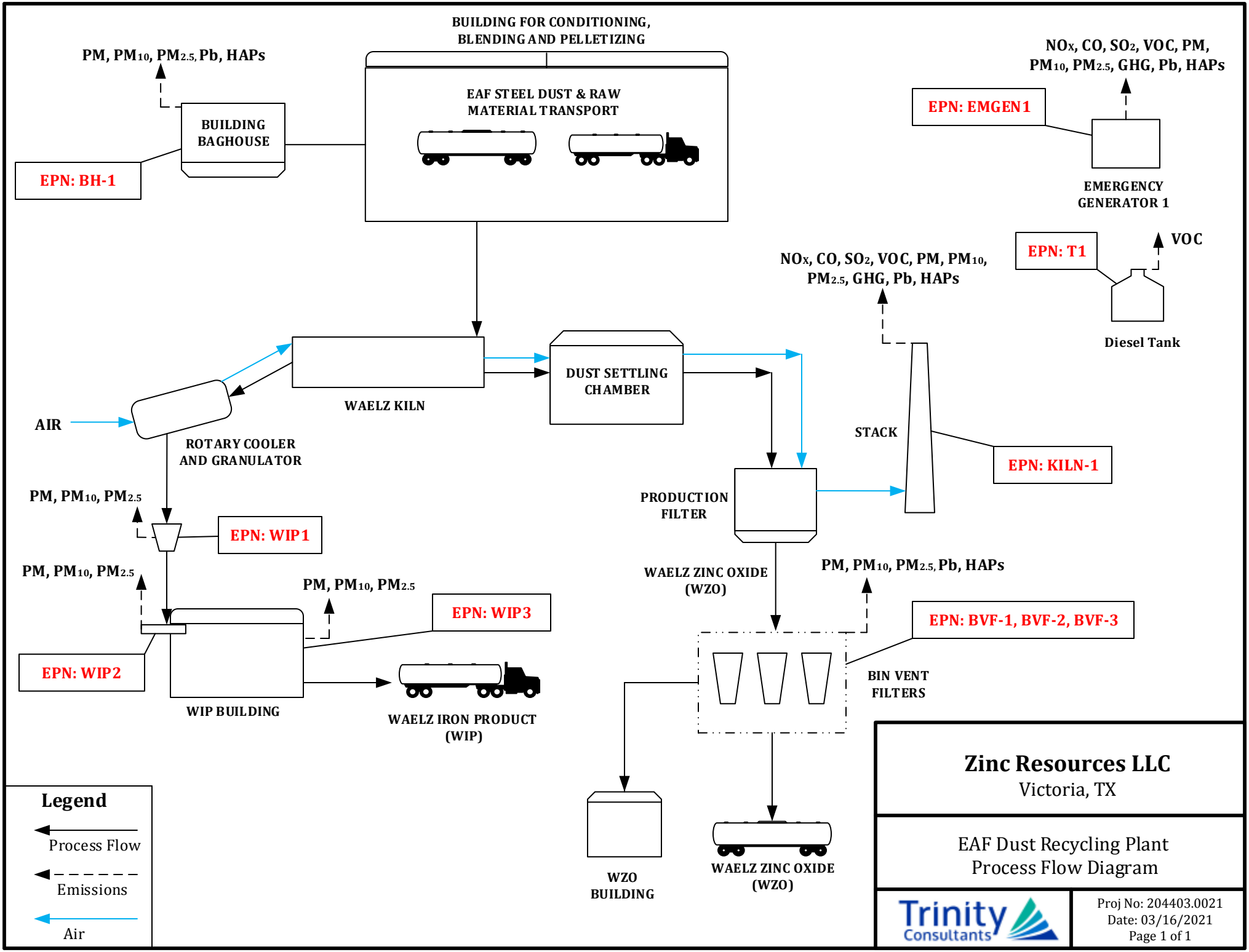
The gas stream travels up the kiln entraining the newly formed WZO particles and carries them into the Dust Settling Chamber. The Dust Settling Chamber allows entrained particles from the kiln to settle out. This gas stream is then cooled and enters the Production Filter where the particles of WZO are separated from the gas stream. The cleaned gas then passes through and exits the kiln stack (EPN: KILN-1).

The collected WZO is diluted with conveyed phase air through various WZO silos (EPN: BVF-1 and EPN: BVF-2). From these silos, the WZO is packed into big bags or gravity discharged into a PD railcar and then shipped to customers.

Utilities

An Emergency Generator (EPN: EMGEN1) is used to supply power to critical systems of the plant allowing a safe controlled shutdown without emissions or equipment damage in the event of an electrical power outage.

A Diesel Tank (EPN: T1) will also be present to store diesel onsite.


BUILDING FOR CONDITIONING, BLENDING AND PELLETIZING
PM, PM10, PM2.5, Pb, HAPs
BUILDING BAGHOUSE
EPN: BH-1
EAF STEEL DUST & RAW MATERIAL TRANSPORT
NOx, CO, SO2, VOC, PM, PM10, PM2.5, GHG, Pb, HAPs
EPN: EMGEN1
EMERGENCY GENERATOR 1
EPN: T1
VOC
Diesel Tank
NOx, CO, SO2, VOC, PM, PM10, PM2.5, GHG, Pb, HAPs
WAELZ KILN
DUST SETTLING CHAMBER
AIR
ROTARY COOLER AND GRANULATOR
STACK
EPN: KILN-1
PM, PM10, PM2.5
EPN: WIP1
PRODUCTION FILTER
PM, PM10, PM2.5
PM, PM10, PM2.5
EPN: WIP3
WAELZ ZINC OXIDE (WZO)
PM, PM10, PM2.5, Pb, HAPs
EPN: BVF-1, BVF-2, BVF-3
EPN: WIP2
WIP BUILDING
WAELZ IRON PRODUCT (WIP)
BIN VENT FILTERS
WZO BUILDING
WAELZ ZINC OXIDE (WZO)
Legend
Process Flow
Emissions
Air
Zinc Resources LLC
Victoria, TX
EAF Dust Recycling Plant
Process Flow Diagram
Trinity Consultants
Proj No: 204403.0021
Date: 03/16/2021
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4.0 EMISSION CALCULATIONS

The following sections contain detailed descriptions of the methodology used to quantify emissions from the activities at the Recycling Plant that are proposed to be authorized under this permit. The calculations provided in this application represent worst-case emissions for the proposed Recycling Plant operations.

Facility emissions will be emitted from the Waelz Kiln exhaust, Building Baghouse, Bin Vent Filters, Emergency Generator and a Diesel Tank and the baghouse used to control emissions from the feed processing building. As described above, a 75 MMBTU/hr burner in the Waelz Kiln is only utilized to provide heat to startup and supplement the exothermic zinc oxide process in the kiln. On a potential to emit basis, however, emissions have been considered on an unrestricted basis using both natural gas, propane, and No. 2 fuel oil containing up to 15 ppm sulfur assuming full capacity at 75 MMBTU/hr for 8760 hours of operation annually.

4.1 Waelz Kiln (EPN: Kiln-1)

Potential emissions of products of combustion from the Waelz Kiln are generated from complex metallurgical reactions in the kiln and various stages of reducing and oxidizing atmospheres as material and airflow traverse the kiln. The reactions in these atmospheres generate emissions of various pollutants such as nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), particular matter (PM), particulate matter with an aerodynamic diameter of less than 10 microns (PM_{10}), particulate matter with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$), sulfur dioxide (SO_2), and Hazardous Air Pollutants (HAPs).

Emissions from the kiln normal operations are estimated using industry-developed emission factors for similar facilities and are based on a mass emission rate per ton of material processed by the kiln for all pollutants except $PM/PM_{10}/PM_{2.5}$. Specifically, for the process emission rates, Zinc Resources referenced emission rates for similar units across the US. Emissions of $PM/PM_{10}/PM_{2.5}$ are estimated using an exit grain loading rate for the dust collector and the exhaust flow rate.

The Waelz Kiln will also be equipped with a fossil fuel burner that will be used for startup operations and, to a much lesser extent, to control the reaction zones inside the kiln. Natural gas combustion emission factors are obtained from AP-42 Section 1.4, Tables 1.4-1 and 1.4-2 (July 1998). Propane emission factors are obtained from AP-42 Section 1.5, Table 1.5 (July 2008). Fuel oil combustion emission factors are obtained from AP-42 Section 1.3, Tables 1.3-1 and 1.3-12 (May 2010). For flexibility, Zinc Resources has estimated emissions for both a natural gas, propane, and a diesel-fired burner, but the final process will only include one type of fuel.

Short-term emissions from the Waelz Kiln are calculated by assuming the worst-case emissions from startup operation and normal operation. The annual emissions are then calculated by multiplying the worst-case hourly emissions rate by 8,760 hours of operation. Detailed emission calculations are provided in Appendix C.

4.2 Building Baghouse & Bin Vent Filters (EPN: BH-1, BH-2, BH-3, BH-4, and BVF 1-2)

Emissions of particulate matter are emitted from the Building Baghouse (EPN: BH-1) and Bin Vent Filters (BVF 1-3) controls emissions from the feed processing building, product silos, and WZO product loading.

Emissions are estimated based on the outlet grain loading in the exhaust. Emissions of metals HAPs such as lead are calculated based on the maximum expected weight percentage of each in the respective material being filtered. The speciation of metals was determined based on process knowledge of typical EAF dust speciation in the US.

Zinc Resources will have Standard Operating Procedures (SOPs) in place that require doors to the main production building to be closed while activities that will create PM are underway. Thus, the openings in the building will be limited to the surface area of louvers used to control the airflow into the building. The face velocity across the openings will exceed 100 fpm.

There are two hygiene collectors (F1961 and F1962) which collect dust at the unloading area and discharge the cleaned air back into the feed processing building. Emissions from these points are not included separately in the emission spreadsheet since their exhaust is accounted for in the emissions from the Building Baghouse (EPN: BH-1) controlling the feed processing building exhaust. Detailed emission calculations are provided in Appendix C.

4.3 Bulk Material Transfer Emissions (EPN: WIP 1-3)

Emissions due to bulk material transfer of Waelz Iron Product (WIP) have been estimated based on AP-42 Chapter 13.2.4.

4.4 Emergency Generator (EPN: EMGEN1)

Emissions from the diesel-fired emergency generator are estimated using emission factors obtained from 40 CFR 89.112, Table 1 for a Tier 2 engine with a power rating > 560 kW. Emissions are based on maximum operation time of 100 hours. A maximum of 50 hours of maintenance and 50 hours of general use are allowed under MACT ZZZZ for emergency engines. GHG emissions are based on 40 CFR Part 98 Tables C-1 and C-2. Detailed emission calculations are provided in Appendix C.

4.5 Diesel Tank (EPN: T1)

Emissions from the diesel storage tank are estimated based on working and breathing losses from AP-42 Chapter 7.1 (June 2020). Short term emission rates are calculated using TCEQ's guidance for fixed roof tanks (APDG 6250v3, revised 02/20). Detailed emission calculations are provided in Appendix C.

5.0 BEST AVAILABLE CONTROL TECHNOLOGY (BACT)

5.1 Federal PSD BACT Methodology

The proposed project does not trigger PSD review since all proposed pollutant emissions are below their respective Signification Emission Rates (SERs).

5.2 State BACT Discussion

The pollutants that are not subject to PSD BACT requirements are subject to State BACT requirements and will comply with Tier I BACT. The following sections describe how each of the emission units will meet State BACT requirements under 30 TAC 116.111(a)(2)(C). Please refer to the "BACT" tab under the PI-1 Form for more details.

Waelz Kiln (EPN: Kiln-1)

Zinc Resources proposes a baghouse with an exit grain loading rate of 0.003 gr/dscf to control PM emissions from the Waelz Kiln as BACT. This is consistent with other Waelz Kilns in operation throughout the United States.

There are no similar sources authorized in Texas that Zinc Resources is aware of. However, there are a number of similar sources authorized across the United States. The proposed Waelz Kiln emissions are derived from process emission limits at existing Waelz Kilns. As such, they are consistent with recent NSR authorizations and therefore represent Tier I BACT. The similar sources are discussed below.

In the United States, there are at least four (4) facilities currently operating Waelz Kilns similar to the proposed operations. Each of these facilities are listed below:

- Steel Dust Recycling, LLC – Millport, Alabama – Title V Permit No. 408-0010
- American Zinc Recycling Corp. – Chicago, IL – Title V Permit No. 031600AFV
- American Zinc Recycling Corp. – Rockwood, TN – Title V Permit No. 562547
- American Zinc Recycling Corp. – Palmerton, PA – Title V Permit No. 13-00001
  - The kilns at the Palmerton facility are Waelz Kilns/Calciners and therefore the emissions limits are not directly comparable to the proposed kiln at the Recycling Facility. Therefore, the limits for the Palmerton facility are not discussed further.

Though Zinc Resources believe that Tier I BACT is satisfied by comparing the proposed BACT to the emission limits for the similar sources listed above, Zinc Resources has also provided a brief Tier II BACT review for each pollutant that compares the proposed BACT to Tier I BACT for cement kilns. Cement kilns represent a source in a different industry that have a similar air emissions stream but have key technical differences that affect the emissions. These differences are discussed in each pollutant's section below. Proposed BACT for each pollutant is discussed below.

PM Emissions

Tier I BACT PM

The following table provides the PM emission limits for similar facilities with the same SIC and/or NAICS code mentioned above.

Table 5-1. PM BACT Emission Limits for Similar Facilities

	Millport, AL	Chicago, IL	Rockwood, TN
Control Technology	Baghouse	Baghouse	Baghouse
PM Emissions Limit	Kiln Nos. 1-3 0.016 gr/dscf	Kiln No. 1 2.44 lb/hr	Kiln No. 1 0.02 gr/dscf 15.71 lb/hr
		Kiln No. 2 2.80 lb/hr	Kiln No. 2 9.9 lb/hr

Zinc Resources is proposing the following as BACT for $PM/PM_{10}/PM_{2.5}$ emissions from the Waelz Kiln at the Recycling Facility. Based on the emission limits for other approved facilities, the proposed BACT meets or exceeds BACT requirements for this operation.

Table 5-2. PM BACT Proposed Emission Limit

$PM/PM_{10}/PM_{2.5}$ Emissions	Victoria, TX (Proposed)
Control Technology	Baghouse
PM Emissions Limit	0.003 gr/dscf 1.68 lb/hr

Tier I BACT from fabric filters is well established as 99% reduction or outlet grain loading of 0.01 gr/dscf. Therefore, the proposed control satisfies BACT.

SO_2 Emissions

Tier I BACT – SO_2

The following table provides the SO_2 emission limits for each of the facilities mentioned above that have the same SIC and/or NAICS code as the proposed recycling plant.

Table 5-3. SO_2 BACT Emission Limits for Similar Facilities

	Millport, AL	Chicago, IL	Rockwood, TN
Control Technology	Raw Material Monitoring	Pipeline Quality NG	Pipeline Quality NG or 0.5% S in fuel
SO_2 Emissions Limit	Kiln Nos. 1-3 1.5 lb/hr 0.07 lb/ton	Kiln No. 1 1.22 lb/hr 0.073 lb/ton	Kiln No. 1 0.977 lb/hr 0.065 lb/ton
		Kiln No. 2 1.22 lb/hr 0.067 lb/ton	Kiln No. 2 1.36 lb/hr 0.065 lb/ton

Zinc Resources is proposing the following as BACT for SO_2 emissions from the Waelz Kiln at the Recycling Facility. Based on the emission limits for other approved facilities, the proposed BACT is representative of what is permitted elsewhere.

Table 5-4. SO_2 BACT Proposed Emission Limit

SO_2 Emissions	Victoria, TX (Proposed)
Control Technology	Pipeline Quality NG or 15 ppm S in Fuel
SO_2 Emissions Limit	1.70 lb/hr 0.070 lb/ton

The main product from the Waelz kiln, WZO, has a natural affinity for sulfur, making the SO_2 emissions from the Waelz kiln inherently low to begin with. As such, when combined with the use of low-sulfur fuels, this represents BACT for SO_2 emissions from the Waelz kiln. The use of low-sulfur fuels is well-established as BACT from combustion sources and therefore, a Tier II BACT analysis is not required.

NO_X Emissions

Tier I BACT – NO_X

The following table provides the NO_X emission limits for each of the facilities mentioned above.

Table 5-5. NO_X BACT Emission Limits for Similar Facilities

	Millport, AL	Chicago, IL	Rockwood, TN
Control Technology	N/A	N/A	N/A
NO_X Emissions Limit	Kiln Nos. 1-3 11 lb/hr 0.57 lb/ton	Kiln No. 1 9.58 lb/hr 0.57 lb/ton	Kiln No. 1 15 lb/hr 1 lb/ton
		Kiln No. 2 9.5 lb/hr 0.52 lb/ton	Kiln No. 2 21 lb/hr 1 lb/ton

Zinc Resources is proposing the following as BACT for NO_X emissions from the Waelz Kiln at the Recycling Facility. Based on the emission limits for other approved facilities, the proposed BACT is representative of what is permitted elsewhere.

Table 5-6. NO_X BACT Proposed Emission Limit

NO_X Emissions	Victoria, TX (Proposed)
Control Technology	Good Combustion Practices
NO_X Emissions Limit	13.83 lb/hr 0.57 lb/ton

Tier II BACT - NO_X

Zinc Resources evaluated the NO_X Tier I BACT for cement kilns as a comparable source. Tier I BACT for cement kilns is either dry low NO_X combustors, non-selective catalytic reduction (NSCR), or water/steam injection. However due to fundamental differences between the operation of a cement kiln and a Waelz kiln, none of these controls represent a viable control option for the Waelz kiln.

Low-NO_X burners are not compatible with Waelz kilns and would not have a significant impact on the NO_X generated from the process. The burners are used only in a limited capacity during normal operation. Their primary purpose is to operate during startup and occasionally during normal operation to control the combustion zone in the kiln. Low-NO_X burners reduce the formation of NO_X by controlling the air-to-fuel ratio in the combustion zone of the burner and therefore require the ability to carefully control the flow of air to the burner. However, at the same time, a key variable in controlling the oxidation reaction in the kiln is the airflow. Therefore, controlling the airflow to operate a low-NOx burner would be in direct competition with controlling the airflow needed to maintain the integrity of the reaction in the kiln.

Similarly, water/steam injection would not be an effective control of NO_X for a Waelz kiln because it works by lowering the flame temperature and reducing the formation of thermal NO_X in the combustor flame. SNCR requires temperatures in the flue gas in excess of 1600 °F (871 °C) to be effective. The exhaust gas from the Waelz kiln will be less than 350 °F, meaning SNCR would not be an effective control technology.

Therefore, Zinc Resources is proposing good combustion practices in the kiln through monitoring of the ratio of feed materials and the combustion zone inside the kiln as BACT for NO_X.

CO Emissions

The following table provides the CO emission limits for each of the facilities mentioned above.

Table 5-7. CO BACT Emission Limits for Similar Facilities

	Millport, AL	Chicago, IL	Rockwood, TN
Control Technology	N/A	N/A	N/A
CO Emissions Limit	Kiln Nos. 1-3 21 lb/hr 1.050 lb/ton	Kiln No. 1 17.33 lb/hr 1.04 lb/ton	Kiln No. 1 13.5 lb/hr 0.90 lb/ton
		Kiln No. 2 16.21 lb/hr 0.891 lb/ton	Kiln No. 2 21.24 lb/hr 1.01 lb/ton

Zinc Resources is proposing the following as BACT for CO emissions from the Waelz Kiln at the Recycling Facility. Based on the emission limits for other approved facilities, the proposed BACT is representative of what is permitted elsewhere.

Table 5-8. CO BACT Proposed Emission Limit

CO Emissions	Victoria, TX (Proposed)
Control Technology	Good Combustion Practices
CO Emissions Limit	22.71 lb/hr 0.936 lb/ton

Tier II BACT - CO

Zinc Resources evaluated the CO Tier I BACT for cement kilns as a comparable source. Tier I BACT for cement kilns is either good combustion practices or the use of an oxidation catalyst. Unlike cement kilns, Waelz kilns only use the burners for startup (to reach initial temperatures) and then periodically to manipulate the reaction in the kiln. Oxidation catalysts are not technologically feasible with a Waelz kiln as they would require heating the exhaust stream back up to a temperature in excess of 650°F to be effective (exhaust from the Waelz kiln is 350°F). Good combustion practices is also Tier I BACT for cement kilns and feasible with Waelz kilns. Therefore, Zinc Resources is proposing good combustion practices in the kiln through monitoring of the ratio of feed materials and the combustion zone inside the kiln as BACT for CO.

VOC Emissions

The following table provides the VOC emission limits for each of the facilities mentioned above.

Table 5-9. VOC BACT Emission Limits for Similar Facilities

	Millport, AL	Chicago, IL	Rockwood, TN
Control Technology	N/A	N/A	N/A
VOC Emissions Limit	Kiln Nos. 1-3 2 lb/hr 0.1 lb/ton	N/A*	Kiln No. 1 15.45 lb/hr 1.03 lb/ton
		N/A*	Kiln No. 2 21.63 lb/hr 1.03 lb/ton

Zinc Resources is proposing the following as BACT for VOC emissions from the Waelz Kiln at the Recycling Facility. Based on the emission limits for other approved facilities, the proposed BACT exceeds BACT requirements for this operation.

Table 5-10. VOC BACT Proposed Emission Limit

VOC Emissions	Victoria, TX (Proposed)
Control Technology	Good Combustion Practices
VOC Emissions Limit	2.43 lb/hr 0.1 lb/ton

Tier II BACT – VOC

Zinc Resources evaluated the VOC Tier I BACT for cement kilns as a comparable source. Tier I BACT for cement kilns is either good combustion practices or the use of oxidizers. Therefore, Zinc Resources is proposing good combustion practices in the kiln through monitoring of the ratio of feed materials and the combustion zone inside the kiln as BACT for VOC.

Building Baghouse & Bin Vent Filters (EPN: BH-1, BH-2, BH-3, BH-4, and BVF 1-2)

Zinc Resources will operate several baghouses at the Recycling Facility. Tier I BACT for these sources is well established as 0.01 gr/dscf. Zinc Resources will meet or exceed the Tier I BACT limit of 0.01 gr/dscf for all of these sources.

Table 5-11. Building Baghouse and Bin Vent Filters Proposed Emission Limit

PM Emissions Limit	Victoria, TX (Proposed)
Control Technology	Baghouse
BH-1, BH-2, BH-3, and BH-4	0.003 gr/dscf
BVF 1-2	0.003 gr/dscf

Bulk Material Transfer Emissions (EPN: WIP 1-3)

Bulk material transfer operations at the Recycling Plant will meet Tier I BACT by being covered or enclosed conveyors to reduce fugitive emissions.

Emergency Generator (EPN: EMGEN1)

The Emergency Engine will meet Tier I BACT by complying with the requirements of NSPS Subpart IIII, firing ULSD of no more than 15 ppm sulfur by weight, limiting non-emergency operation to less than 100 hr/yr and equipping a non-resettable runtime meter.

Diesel Tank (EPN: T1)

The diesel storage tank is a potential source of VOC emissions. The tank will meet Tier I BACT by utilizing a fixed roof tanks since diesel as an inherently low vapor pressure of less than 0.50 psia and the tank is less than 25,000 gallons. The tank will be painted white and will be equipped with a submerged fill pipe.

6.0 STATE AND FEDERAL REGULATORY REQUIREMENTS

This section provides a summary of the applicable state and Federal regulatory requirements.

6.1 Regulatory Requirements

6.1.1 General Application Requirements (30 TAC §116.111)

(a) In order to be granted a permit, amendment, or special permit amendment, the application must include:

(1) a completed Form PI-1 General Application signed by an authorized representative of the applicant. All additional support information specified on the form must be provided before the application is complete;

A completed TCEQ Form PI-1 signed by an authorized representative and all additional supporting information as specified on the form are provided in this application.

(2) information which demonstrates that emissions from the facility, including any associated dockside vessel emissions, meet all of the following.

(A) Protection of public health and welfare.

(i) The emissions from the proposed facility will comply with all rules and regulations of the commission and with the intent of the Texas Clean Air Act (TCAA), including protection of the health and property of the public.

Zinc Resources will comply with all rules and regulations of the commission and with the intent of the Texas Clean Air Act (TCAA), including protection of the health and property of the public. A review of potentially applicable rules is provided below.

Chapter 101 – General Rules
The Recycling Plant will be operated in accordance with all applicable requirements in Chapter 101. Specifically, the Recycling Plant will be operated in accordance with Chapter 101 General Rules relating to Circumvention, Nuisance, Traffic Hazard, Sampling, Sampling Ports, Emissions Inventory Requirements, Sampling Procedures and Terminology, Compliance with Environmental Protection Agency Standards, Inspection Fees, Emission Fees and all other applicable General Rules.

Chapter 111 - Control of Air Pollution from Visible Emissions and Particulate Matter
The Recycling Plant will comply with all applicable requirements in Chapter 111, including the allowable visible emission requirements in 30 TAC §111.111 and the PM emission rate specified in 30 TAC §111.151. In addition, Zinc Resources will comply with the outdoor burning restrictions in 30 TAC §111.201

Chapter 112 – Control of Air Pollution from Sulfur Compounds
The Recycling Plant will comply with all applicable emission limitations, allowable emission rates, monitoring, reporting, and recordkeeping requirements of 30 TAC Chapter 112.

Chapter 113 – Control of Air Pollution from Toxic Materials

Chapter 113 regulates the emission of radionuclides (40 CFR Part 61, Subpart R), municipal solid waste landfills, hospital/medical/infectious waste incinerators, and hazardous air pollutants for source categories (40 CFR Part 63). There will be no emissions of radionuclides from the Recycling Plant. The Recycling Plant is not a municipal solid waste landfill and does not have a hospital/medical/infectious waste incinerator. Therefore, these sections of the regulation do not apply.

Chapter 114 – Control of Air Pollution from Motor Vehicles
All motor vehicles owned or operated by Zinc Resources will comply with the applicable provisions of this regulation including maintenance and operation of air pollution control systems or devices, inspection requirements, equipment evaluation procedures for vehicle exhaust gas analyzers, and use of oxygenated fuels.

Chapter 115 – Control of Air Pollution from Volatile Organic Compounds (VOC)
The Recycling Plant will comply with all applicable requirements in Chapter 115.

Chapter 117 – Control of Air Pollution from Nitrogen Compounds
The Recycling Plant is located in Victoria County; therefore, it is not subject to the requirements of Chapter 117.

Chapter 118 – Control of Air Pollution Episodes
The Recycling Plant will be operated in compliance with the rules relating to generalized and localized air pollution.

Chapter 122 – Federal Operating Permits
The Recycling Plant is a minor source of regulated pollutants as defined in Chapter 122. Therefore, the requirements of this chapter do not apply.

(ii) For issuance of a permit for construction or modification of any facility within 3,000 feet of an elementary, junior high/middle, or senior high school, the commission shall consider any possible adverse short-term or long-term side effects that an air contaminant or nuisance odor from the facility may have on the individuals attending the school(s).

There are no schools within 3,000 ft from the Recycling Plant.

(B) Measurement of emissions. The proposed facility will have provisions for measuring the emission of significant air contaminants as determined by the executive director. This may include the installation of sampling ports on exhaust stacks and construction of sampling platforms in accordance with guidelines in the "Texas Commission on Environmental Quality Sampling Procedures Manual."

Emissions from any source addressed in the application will be sampled upon request of the Executive Director of the TCEQ, and sampling ports and sampling platforms will be installed as needed.

(C) Best available control technology (BACT) must be evaluated for and applied to all facilities subject to the TCAA. Prior to evaluation of BACT under the TCAA, all facilities with pollutants subject to regulation under the Federal Clean Air Act (FCAA), Title I, Part C shall evaluate and apply BACT as defined in §116.160(c)(1)(A) of this title (relating to Prevention of Significant Deterioration Requirements).

Section 5 of this permit application demonstrates that the Recycling Plant will utilize BACT for all emissions sources being proposed as part of this permit application. Please refer to the BACT section of the PI-1 form for more details.

(D) New Source Performance Standards (NSPS). The emissions from the proposed facility will meet the requirements of any applicable NSPS as listed under 40 Code of Federal Regulations (CFR) Part 60, promulgated by the United States Environmental Protection Agency (EPA) under FCAA, §111, as amended.

The Recycling Plant is subject to 40 CFR Part 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines and will comply with all applicable requirements.

(E) National Emission Standards for Hazardous Air Pollutants (NESHAP). The emissions from the proposed facility will meet the requirements of any applicable NESHAP, as listed under 40 CFR Part 61, promulgated by EPA under FCAA, §112, as amended.

There are no facilities in the Recycling Plant that are subject to National Emission Standards for Hazardous Air Pollutants (NESHAPs) under 40 CFR Parts 61.

(F) NESHAP for source categories. The emissions from the proposed facility will meet the requirements of any applicable maximum achievable control technology standard as listed under 40 CFR Part 63, promulgated by the EPA under FCAA, §112 or as listed under Chapter 113, Subchapter C of this title (relating to National Emissions Standards for Hazardous Air Pollutants for Source Categories (FCAA §112, 40 CFR Part 63)).

The Recycling Plant is subject to 40 CFR Part 63 Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines and will comply with all applicable requirements.

(G) Performance demonstration. The proposed facility will achieve the performance specified in the permit application. The applicant may be required to submit additional engineering data after a permit has been issued in order to demonstrate further that the proposed facility will achieve the performance specified in the permit application. In addition, dispersion modeling, monitoring, or stack testing may be required.

The Recycling Plant will achieve the performance represented in this permit application. Zinc Resources will submit additional engineering data or perform ambient monitoring or stack testing for the Recycling Plant, if required by the TCEQ, to confirm performance as represented in the permit application.

(H) Nonattainment review. If the proposed facility is located in a nonattainment area, it shall comply with all applicable requirements in this chapter concerning nonattainment review.

The Recycling Plant is not located in a nonattainment county, NNSR is not applicable.

(I) Prevention of Significant Deterioration (PSD) review.

(i) If the proposed facility is located in an attainment area, it shall comply with all applicable requirements in this chapter concerning PSD review.

(ii) If the proposed facility or modification meets or exceeds the applicable greenhouse gases thresholds defined in §116.164 of this title (relating to Prevention of Significant Deterioration Applicability for Greenhouse Gases Sources) then it shall comply with all applicable requirements in this chapter concerning PSD review for sources of greenhouse gases.

The Recycling Plant is a minor source with respect to PSD program.

(J) Air dispersion modeling. Computerized air dispersion modeling may be required by the executive director to determine air quality impacts from a proposed new facility or source modification. In determining whether to issue, or in conducting a review of, a permit application for a shipbuilding or ship repair operation, the commission will not require and may not consider air dispersion modeling results predicting ambient concentrations of non-criteria air contaminants over coastal waters of the state. The commission shall determine compliance with non-criteria ambient air contaminant standards and guidelines at land-based off-property locations.

Section 7 discusses air dispersion modeling as applicable.

(K) Hazardous air pollutants. Affected sources (as defined in §116.15(1) of this title (relating to Section 112(g) Definitions)) for hazardous air pollutants shall comply with all applicable requirements under Subchapter E of this chapter (relating to Hazardous Air Pollutants: Regulations Governing Constructed or Reconstructed Major Sources (FCAA, §112(g), 40 CFR Part 63)).

This section is not applicable as the Recycling Plant is a minor source for HAPs.

(L) Mass cap and trade allowances. If subject to Chapter 101, Subchapter H, Division 3 of this title (relating to Mass Emissions Cap and Trade Program), the proposed facility, group of facilities, or account must obtain allowances to operate.

This regulation refers to Chapter 101, Subchapter H, Division 3, which applies to facilities in the Houston-Galveston-Brazoria (HGB) ozone nonattainment area. The Recycling Plant is located in Victoria County and is therefore not subject to this requirement.

(b) In order to be granted a permit, amendment, or special permit amendment, the applicant must comply with the requirements of Chapter 39 of this title (relating to Public Notice) and Chapter 55 of this title (relating to Request for Reconsideration and Contested Case Hearings; Public Comment).

Zinc Resources will comply with all applicable requirements of Chapter 39.

(c) Upon request by the owner or operator of a facility which previously has received a permit or special permit from the commission, the executive director or designated representative may exempt the relocation of such facility from the provisions in Chapter 39 of this title if there is no indication that the operation of the facility at the proposed new location will significantly affect ambient air quality and no indication that operation of the facility at the proposed new location will cause a condition of air pollution.

Zinc Resources will comply as applicable.

7.0 MODELING AND HEALTH EFFECTS REVIEW

7.1 Minor NAAQS Modeling and Analysis

The purpose of the NAAQS analysis is to demonstrate that proposed emissions of criteria pollutants from a new facility or from a modification of an existing facility that does not trigger PSD review will not cause or contribute to an exceedance of the NAAQS. As detailed in the EMEW in Appendix E, the potential impacts from the Recycling Plant will not cause or contribute to an exceedance of any NAAQS. Details have been provided in the NAAQS-SPL Modeling Results tab of the EMEW (Appendix E).

7.2 Health Effects Evaluation

Health Effects Evaluation is required for applicable contaminants to demonstrate compliance with TCEQ Toxicology Division's Effects Screening Levels (ESL) guidelines. This evaluation is completed based on TCEQ's Modeling Effects and Review Applicability guidance (TCEQ document APDG 5874v5, revised 03/18).

A Health Effects Evaluation was completed for the following Chemical Species. Zinc Resources used a combination of Unit Impact Modeling (UIM) and site-wide modeling to demonstrate that the potential impacts will meet the applicable standards for each species.

- Fuel Oil No. 2
  - Demonstrated compliance by multiplying UIM by emission rate for all sources. Site-wide impacts using UIM are less than the ESL on a 1-hr and annual basis.
- Cadmium
  - Demonstrated compliance by multiplying UIM by emission rate for all sources. Site-wide impacts using UIM are less than the ESL on a 1-hr and annual basis.
- Chlorine
  - Demonstrated compliance by multiplying UIM by emission rate for all sources. Site-wide impacts using UIM are less than the ESL on a 1-hr and annual basis.
- Manganese
  - Demonstrated compliance with the 1-hr standard by conducting site-wide modeling for 1-hr emissions. Two (2) hours exceeded the ESL by less than 2X for the year at the GLC_{Max} receptor. Given the low magnitude and number of exceedances, these results are still protective of public heath.
  - Demonstrated compliance with the annual standard by multiplying the UIM be emission rate for all sources. Site-wide impacts are less than the ESL for the annual averaging period.

Details of the modeling conducted are provided in the Health Effect Modeling Results tab of the EMEW (Appendix E).

8.0 PERMIT FEE AND PROFESSIONAL ENGINEER (P.E.) SEAL

Pursuant to 30 TAC Section (§) 116.141, the permit fee for a construction permit application is based on the capital cost of the proposed project. The permit fee is determined as 1.0% of the capital cost (for PSD Permit Applications) of the proposed project with a minimum fee of $900 and a maximum fee of $75,000.

The permit fee is discussed in the PI-1 form. The capital investment for the project is estimated at $50,000,000 and accordingly Zinc Resources has paid online the fee of $75,000 to the TCEQ using ePay.

In addition, Zinc Resources is also requesting an expedited review for the project and will submit the surcharge payment of $10,000 for NSR case-by-case permit project type upon request from TCEQ.

Since the capital cost of the project will be more than $2 million, a Professional Engineer (P.E.) review has been conducted on the emission estimates and BACT analysis. The P.E. seal is attached in this section for the proposed project.

PROFESSIONAL ENGINEER CERTIFICATION

Based on the information provided by Zinc Resources LLC, I directly supervised the engineering work products contained in the following sections of this document.

Emissions Calculations

Best Available Control Technology

To the best of my knowledge, the representations made in this document are true and accurate. By affixing my seal below, I submit that the engineering work and calculations performed in the above listed sections were either performed by myself or under my direct supervision, as defined in Section 131.18 of the Texas Engineering Practice Act and incompliance with Title 30 of the Texas Administrative Code, Chapter 116, Section 116.110(f).

Place P.E. Seal below this line

3/16/21

Signature Date

NAME: Adam Mielnicki, Trinity Consultants

APPENDIX A. CORE DATA AND EXPEDITED REVIEW FORMS

TCEQ Core Data Form

TCEQ Use Only

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission (*If other is checked please describe in space provided.*)

☒ New Permit, Registration or Authorization (*Core Data Form should be submitted with the program application.*)

☐ Renewal (*Core Data Form should be submitted with the renewal form*) ☐ Other

2. Customer Reference Number *(if issued)*	Follow this link to search for CN or RN numbers in Central Registry**	3. Regulated Entity Reference Number *(if issued)*
CN 605840602		RN 105630461

SECTION II: Customer Information

4. General Customer Information | **5. Effective Date for Customer Information Updates** (mm/dd/yyyy)

☒ New Customer ☐ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐ Change in Legal Name (Verifiable with the Texas Secretary of State or Texas Comptroller of Public Accounts)

The Customer Name submitted here may be updated automatically based on what is current and active with the Texas Secretary of State (SOS) or Texas Comptroller of Public Accounts (CPA).

6. Customer Legal Name (*If an individual, print last name first: eg: Doe, John*) *If new Customer, enter previous Customer below:*

Zinc Resources LLC

7. TX SOS/CPA Filing Number	8. TX State Tax ID (11 digits)	9. Federal Tax ID (9 digits)	10. DUNS Number (*if applicable*)
0803260826	32070024552	83-4006425	

11. Type of Customer: ☐ Corporation ☐ Individual Partnership: ☐ General ☒ Limited
Government: ☐ City ☐ County ☐ Federal ☐ State ☐ Other ☐ Sole Proprietorship ☐ Other:

12. Number of Employees
☐ 0-20 ☒ 21-100 ☐ 101-250 ☐ 251-500 ☐ 501 and higher

13. Independently Owned and Operated?
☒ **Yes** ☐ **No**

14. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check one of the following*

☐ Owner ☐ Operator ☒ Owner & Operator
☐ Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐ Other:

15. Mailing Address:

109 N Post Oak Ln #415

City	State	ZIP	ZIP + 4
Houston	TX	77024	

16. Country Mailing Information (*if outside USA*)	17. E-Mail Address (*if applicable*)
	Rcrittendon@zincresources.com

18. Telephone Number	19. Extension or Code	20. Fax Number (*if applicable*)
(832) 350-6800		(866) 260-0127

SECTION III: Regulated Entity Information

21. General Regulated Entity Information (*If 'New Regulated Entity" is selected below this form should be accompanied by a permit application*)

☐ New Regulated Entity ☐ Update to Regulated Entity Name ☒ Update to Regulated Entity Information

The Regulated Entity Name submitted may be updated in order to meet TCEQ Agency Data Standards (removal of organizational endings such as Inc, LP, or LLC).

22. Regulated Entity Name (*Enter name of the site where the regulated action is taking place.*)

EAF Dust Recycling Plant

23. Street Address of the Regulated Entity: *(No PO Boxes)*	1750 FM 1432							
	City	Victoria	**State**	TX	**ZIP**	77905	**ZIP + 4**	
24. County	Victoria County							

Enter Physical Location Description if no street address is provided.

25. Description to Physical Location:					
26. Nearest City			**State**		**Nearest ZIP Code**
27. Latitude (N) In Decimal:			**28. Longitude (W) In Decimal:**		
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds
28	41	36.16	96	57	47.13

29. Primary SIC Code (4 digits)	**30. Secondary SIC Code** (4 digits)	**31. Primary NAICS Code** (5 or 6 digits)	**32. Secondary NAICS Code** (5 or 6 digits)
3341		331492	

33. What is the Primary Business of this entity? *(Do not repeat the SIC or NAICS description.)*

Electric Arc Furnace (EAF) Dust Recycling

34. Mailing Address:	**109 N Post Oak Ln #415**							
	City	**Houston**	**State**	**TX**	**ZIP**	**77024**	**ZIP + 4**	

35. E-Mail Address:	**Rcrittendon@zincresources.com**		
36. Telephone Number	**37. Extension or Code**	**38. Fax Number** *(if applicable)*	
(832) 350-6800		**(866) 260-0127**	

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Emissions Inventory Air	☐ Industrial Hazardous Waste
☐ Municipal Solid Waste	☒ New Source Review Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS
☐ Sludge	☐ Storm Water	☐ Title V Air	☐ Tires	☐ Used Oil
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	AJ Hansborough	**41. Title:**	Manager of Consulting Services
42. Telephone Number	**43. Ext./Code**	**44. Fax Number**	**45. E-Mail Address**
(361) 883-1668	2753	(361) 883-1620	ahansborough@trinityconsulti

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 6 and/or as required for the updates to the ID numbers identified in field 39.

Company:	Zinc Resources LLC	**Job Title:**	CEO
Name *(In Print):*	Ron Crittendon	**Phone:**	(832) 350- **6800**
Signature:		**Date:**	

Texas Commission on Environmental Quality
Form APD-EXP Expedited Permit Request

Instructions
For more information on the expedited permitting program, please refer to the document titled "Initial Implementation of the Expedited Permitting Program" on our website at:
www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/epp-in-impl-guide-external-6258.pdf.

I. Contact Information

List the legal name of the company, corporation, partnership, or person who is requesting to expedite the processing of the application. List the Customer Reference Number (CN) and the Regulated Entity Number (RN). Provide the name, telephone number, and e-mail address of the company official or technical contact. This person must have the authority to make binding agreements and representations on behalf of the applicant. Make sure all contact information matches the information provided on the application form associated with this request (e.g., PI-1).

II. Project Information

List the facility name, permit number, and project number, as applicable. Enter NA if this request accompanies an initial permit. This information should match the application form associated with this request (e.g., PI-1).

III. Economic Justification

Title 30 Texas Administrative Code (TAC) Chapter 101, Subchapter J, allows for permits to be expedited if the applicant can demonstrate that a project will "benefit the economy of this state or an area of this state." Confirm that the purpose of the application associated with this request form will benefit the economy of this state or an area of this state by checking the appropriate box.

IV. Delinquent Fees and Penalties

The Air Permits Division will not expedite this application if any delinquent fees and applicable penalties are owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ, in accordance with TCEQ protocol for delinquent fees and penalties.

V. Signature

Please make sure a signature of the company official or technical contact is included in the application submitted to the TCEQ.

Form APD-EXP Expedited Permitting Request

I. Contact Information	
Company or Other Legal Customer Name: Zinc Resources LLC	
Customer Reference Number (CN):	
Regulated Entity Number (RN):	
Company Official or Technical Contact Name: Ron Crittendon	
Phone Number: 832-350-6800	
Email: Rcrittendon@zincresources.com	
II. Project Information	
Facility Type: EAF Dust Recycling Facility (Initial Minor NSR Permit)	
Permit Number: NA	
Project Number: NA	
III. Economic Justification	
The purpose of the application associated with this request to expedite will benefit the economy of this state or an area of this state.	☒ YES ☐ NO
IV. Delinquent Fees and Penalties	
Applications will not be expedited if any delinquent fees and/or penalties are owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: www.tceq.texas.gov/agency/delin/index.html.	
V. Signature	
The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. As the applicant, I commit to fulfilling all expectations of the expedited permitting program and application requirements promptly. Failure to meet any expectation or requirement may cause my application to be removed from the expedited permitting program and possibly voided at the discretion of the TCEQ Executive Director. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.	
Name: Ron Crittendon	
Signature: 	
Date: 3/16/2021	

Reset Form

APPENDIX B. PI-1 FORM

I. Applicant Information	
I acknowledge that I am submitting an authorized TCEQ application workbook and any necessary attachments. Except for inputting the requested data and adjusting row height and column width, I have not changed the TCEQ application workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree

A. Company Information

Company or Legal Name:	Zinc Resources LLC

Permits are issued to either the facility owner or operator, commonly referred to as the applicant or permit holder. List the legal name of the company, corporation, partnership, or person who is applying for the permit. We will verify the legal name with the Texas Secretary of State at (512) 463-5555 or at:

https://www.sos.state.tx.us

Texas Secretary of State Charter/Registration Number (if given):	

B. Company Official Contact Information: must not be a consultant

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Ron
Last Name:	Crittendon
Title:	CEO
Mailing Address:	109 N Post Oak Ln #415
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77024
Telephone Number:	832-350-6800
Fax Number:	866-260-0127
Email Address:	Rcrittendon@zincresources.com

C. Technical Contact Information: This person must have the authority to make binding agreements and representations on behalf of the applicant and may be a consultant. **Additional technical contact(s) can be provided in a cover letter.**

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Tom
Last Name:	Knepper
Title:	Executive Vice President & Project Manager
Company or Legal Name:	Zinc Resources LLC
Mailing Address:	109 N Post Oak Ln #415
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77024
Telephone Number:	724-650-3618
Fax Number:	713-682-9531
Email Address:	Tknepper@zincresources.com

D. Assigned Numbers

The CN and RN below are assigned when a Core Data Form is initially submitted to the Central Registry. The RN is also assigned if the agency has conducted an investigation or if the agency has issued an enforcement action. If these numbers have not yet been assigned, leave these questions blank and include a Core Data Form with your application submittal. See Section VI.B. below for additional information.

Enter the CN. The CN is a unique number given to each business, governmental body, association, individual, or other entity that owns, operates, is responsible for, or is affiliated with a regulated entity.	CN605840602
Enter the RN. The RN is a unique agency assigned number given to each person, organization, place, or thing that is of environmental interest to us and where regulated activities will occur. The RN replaces existing air account numbers. The RN for portable units is assigned to the unit itself, and that same RN should be used when applying for authorization at a different location.	RN105630461

II. Delinquent Fees and Penalties

Does the applicant have unpaid delinquent fees and/or penalties owed to the TCEQ? This form will not be processed until all delinquent fees and/or penalties owed to the TCEQ or the Office of the Attorney General on behalf of the TCEQ are paid in accordance with the Delinquent Fee and Penalty Protocol. For more information regarding Delinquent Fees and Penalties, go to the TCEQ Web site at: https://www.tceq.texas.gov/agency/financial/fees/delin	No

III. Permit Information

A. Permit and Action Type (multiple may be selected, leave no blanks)

Additional information regarding the different NSR authorizations can be found at:
https://www.tceq.texas.gov/permitting/air/guidance/authorize.html

Select from the drop-down the type of action being requested for each permit type. **If that permit type does not apply, you MUST select "Not applicable".**

Provide all assigned permit numbers relevant for the project. Leave blank if the permit number has not yet been assigned.

Permit Type	Action Type Requested (do not leave blank)	Permit Number (if assigned)
Minor NSR (can be a Title V major source): *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Relocation/Alteration, Change of Location, Alteration, Extension to Start of Construction*	Initial	
Special Permit: *Not applicable, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
De Minimis: *Not applicable, Initial*	Not applicable	
Flexible: *Not applicable, Initial, Amendment, Renewal, Renewal Certification, Renewal/Amendment, Alteration, Extension to Start of Construction*	Not applicable	
PSD: *Not applicable, Initial, Major Modification*	Not applicable	
Nonattainment: *Not applicable, Initial, Major Modification*	Not applicable	

HAP Major Source [FCAA § 112(g)]: *Not applicable, Initial, Major Modification*	Not applicable	
PAL: *Not applicable, Initial, Amendment, Renewal, Renewal/Amendment, Alteration*	Not applicable	
GHG PSD: *Not applicable, Initial, Major Modification, Voluntary Update*	Not applicable	

B. MSS Activities	
How are/will MSS activities for sources associated with this project be authorized?	This permit
C. Consolidating NSR Permits	
Will this permit be consolidated into another NSR permit with this action?	No
Will NSR permits be consolidated into this permit with this action?	No
D. Incorporation of Standard Permits, Standard Exemptions, and/or Permits By Rule (PBR)	

To ensure protectiveness, previously issued authorizations (standard permits, standard exemptions, or PBRs) including those for MSS, are incorporated into a permit either by consolidation or by reference. At the time of renewal and/or amendment, consolidation (in some cases) may be voluntary and referencing is mandatory. More guidance regarding incorporation can be found in 30 TAC § 116.116(d)(2), 30 TAC § 116.615(3) and in this memo:

https://www.tceq.texas.gov/assets/public/permitting/air/memos/pbr_spc06.pdf

Are there any standard permits, standard exemptions, or PBRs to be incorporated by reference?	No
Are there any PBR, standard exemptions, or standard permits associated to be incorporated by consolidation? **Note:** Emission calculations, a BACT analysis, and an impacts analysis must be attached to this application at the time of submittal for any authorization to be incorporated by consolidation.	No
E. Associated Federal Operating Permits	
Is this facility located at a site required to obtain a **site operating permit (SOP)** or **general operating permit (GOP)?**	No

IV. Facility Location and General Information	
A. Location	
County: Enter the county where the facility is physically located.	Victoria
TCEQ Region	Region 14
County attainment status as of Sept. 23, 2019	attainment or unclassified for all pollutants
Street Address:	1750 FM 1432
City: If the address is not located in a city, then enter the city or town closest to the facility, even if it is not in the same county as the facility.	Victoria
ZIP Code: Include the ZIP Code of the physical facility site, not the ZIP Code of the applicant's mailing address.	77905
Site Location Description: If there is no street address, provide written driving directions to the site. Identify the location by distance and direction from well-known landmarks such as major highway intersections.	
Use USGS maps, county maps prepared by the Texas Department of Transportation, or an online software application such as Google Earth to find the latitude and longitude.	
Latitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Latitude is the angular distance of a location north of the equator and will always be between 25 and 37 degrees north (N) in Texas.	28° 41’ 36.16”
Longitude (in degrees, minutes, and nearest second (DDD:MM:SS)) for the street address or the destination point of the driving directions. Longitude is the angular distance of a location west of the prime meridian and will always be between 93 and 107 degrees west (W) in Texas.	96° 57’ 47.13”
Is this a project for a lead smelter, concrete crushing facility, and/or a hazardous waste management facility?	Yes
If yes, does the project meet the distance limitations listed in 30 TAC § 116.112?	Yes
B. General Information	
Site Name:	EAF Dust Recycling Facility
Area Name: Must indicate the general type of operation, process, equipment or facility. Include numerical designations, if appropriate. Examples are Sulfuric Acid Plant and No. 5 Steam Boiler. Vague names such as Chemical Plant are not acceptable.	EAF Dust Recycling Facility

Are there any schools located within 3,000 feet of the site boundary?	No

C. Portable Facility

Permanent or portable facility?	Permanent

D. Industry Type

Principal Company Product/Business:	Products: Waelz Zinc Oxide and Waelz Iron Product Business: EAF Dust Recycling

A list of SIC codes can be found at:
https://www.naics.com/sic-codes-industry-drilldown/

Principal SIC code:	3341

NAICS codes and conversions between NAICS and SIC Codes are available at:
https://www.census.gov/eos/www/naics/

Principal NAICS code:	331492

E. State Senator and Representative for this site

This information can be found at (note, the website is not compatible to Internet Explorer):
https://wrm.capitol.texas.gov/

State Senator:	Lois W. Kolkhorst
District:	18
State Representative:	Geanie W. Morrison
District:	30

V. Project Information

A. Description

Provide a brief description of the project that is requested. (Limited to 500 characters).	Zinc Resources LLC, is proposing to construct an EAF Recycling facility which uses a Waelz Kiln to produce Waelz Zinc Oxide (WZO) and Waelz Iron Product (WIP) from Electric Arc Furnace dust.

B. Project Timing

Authorization must be obtained for many projects before beginning construction. Construction is broadly interpreted as anything other than site clearance or site preparation. Enter the date as "Month Date, Year" (e.g. July 4, 1776).

Projected Start of Construction:	June 15, 2021
Projected Start of Operation:	September 15, 2021

C. Enforcement Projects

Is this application in response to, or related to, an agency investigation, notice of violation, or enforcement action?	No

D. Operating Schedule

Will sources in this project be authorized to operate 8760 hours per year?	Yes

VI. Application Materials

All representations regarding construction plans and operation procedures contained in the permit application shall be conditions upon which the permit is issued. (30 TAC § 116.116)

A. Confidential Application Materials

Is confidential information submitted with this application?	Yes
If yes, is each confidential page marked "CONFIDENTIAL" in large red letters?	Yes

THSC §382.041 requires us not to disclose any information related to manufacturing processes that is marked Confidential. Mark any information related to secret or proprietary processes or methods of manufacture Confidential if you do not want this information in the public file. All confidential information should be separated from the application and submitted as a separate file. Additional information regarding confidential information can be found at: https://www.tceq.texas.gov/permitting/air/confidential.html

B. Is the Core Data Form (Form 10400) attached?	Yes
https://www.tceq.texas.gov/assets/public/permitting/centralregistry/10400.docx	
C. Is a current area map attached?	Yes
Is the area map a current map with a true north arrow, an accurate scale, the entire plant property, the location of the property relative to prominent geographical features including, but not limited to, highways, roads, streams, and significant landmarks such as buildings, residences, schools, parks, hospitals, day care centers, and churches?	Yes
Does the map show a 3,000-foot radius from the property boundary?	Yes
D. Is a plot plan attached?	Yes
Does your plot plan clearly show a north arrow, an accurate scale, all property lines, all emission points, buildings, tanks, process vessels, other process equipment, and two bench mark locations?	Yes
Does your plot plan identify all emission points on the affected property, including all emission points authorized by other air authorizations, construction permits, PBRs, special permits, and standard permits?	Yes
Did you include a table of emission points indicating the authorization type and authorization identifier, such as a permit number, registration number, or rule citation under which each emission point is currently authorized?	N/A
E. Is a process flow diagram attached?	Yes
Is the process flow diagram sufficiently descriptive so the permit reviewer can determine the raw materials to be used in the process; all major processing steps and major equipment items; individual emission points associated with each process step; the location and identification of all emission abatement devices; and the location and identification of all waste streams (including wastewater streams that may have associated air emissions)?	Yes
F. Is a process description attached?	Yes
Does the process description emphasize where the emissions are generated, why the emissions must be generated, what air pollution controls are used (including process design features that minimize emissions), and where the emissions enter the atmosphere?	Yes
Does the process description also explain how the facility or facilities will be operating when the maximum possible emissions are produced?	Yes
G. Are detailed calculations attached? Calculations must be provided for each source with new or changing emission rates. For example, a new source, changing emission factors, decreasing emissions, consolidated sources, etc. You do not need to submit calculations for sources which are not changing emission rates with this project. Please note: the preferred format is an electronic workbook (such as Excel) with all formulas viewable for review. It can be emailed with the submittal of this application workbook.	Yes
Are emission rates and associated calculations for planned MSS facilities and related activities	Yes
H. Is a material balance (Table 2, Form 10155) attached?	N/A
I. Is a list of MSS activities attached?	Yes
Are the MSS activities listed and discussed separately, each complete with the authorization mechanism or emission rates, frequency, duration, and supporting information if authorized by this permit?	Yes
J. Is a discussion of state regulatory requirements attached, addressing 30 TAC Chapters 101, 111, 112, 113, 115, and 117?	Yes
For all applicable chapters, does the discussion include how the facility will comply with the requirements of the chapter?	Yes
For all not applicable chapters, does the discussion include why the chapter is not applicable?	Yes
K. Are all other required tables, calculations, and descriptions attached?	Yes

VII. Signature

The owner or operator of the facility must apply for authority to construct. The appropriate company official (owner, plant manager, president, vice president, or environmental director) must sign all copies of the application. The applicant's consultant cannot sign the application. **Important Note: Signatures must be original in ink, not reproduced by photocopy, fax, or other means, and must be received before any permit is issued.**

The signature below confirms that I have knowledge of the facts included in this application and that these facts are true and correct to the best of my knowledge and belief. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7; the Texas Health and Safety Code, Chapter 382; the Texas Clean Air Act (TCAA); the air quality rules of the Texas Commission on Environmental Quality; or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I understand my signature indicates that this application meets all applicable nonattainment, prevention of significant deterioration, or major source of hazardous air pollutant permitting requirements. The signature further signifies awareness that intentionally or knowingly making or causing to be made false material statements or representations in the application is a criminal offense subject to criminal penalties.

Name:	
Signature:	
Original signature is required.	
Date:	

I. Additional Questions for Specific NSR Minor Permit Actions

E. Concrete Batch Plants

Is this a project for a concrete batch plant?	No

VIII. Federal Regulatory Questions

Indicate if any of the following requirements apply to the proposed facility. Note that some federal regulations apply to minor sources. Enter all applicable Subparts.

A. Title 40 CFR Part 60

Do NSPS subpart(s) apply to a facility in this application?	Yes
List applicable subparts you will demonstrate compliance with (e.g. Subpart M)	Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

B. Title 40 CFR Part 61

Do NESHAP subpart(s) apply to a facility in this application?	No

C. Title 40 CFR Part 63

Do MACT subpart(s) apply to a facility in this application?	Yes
List applicable subparts you will demonstrate compliance with (e.g. Subpart VVVV)	Subpart ZZZZ - National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

IX. Emissions Review

A. Impacts Analysis

Any change that results in an increase in off-property concentrations of air contaminants requires an air quality impacts demonstration. Information regarding the air quality impacts demonstration must be provided with the application and show compliance with all state and federal requirements. Detailed requirements for the information necessary to make the demonstration are listed on the Impacts sheet of this workbook.

Does this project require an impacts analysis?	Yes

B. Disaster Review

If the proposed facility will handle sufficient quantities of certain chemicals which, if released accidentally, would cause off-property impacts that could be immediately dangerous to life and health, a disaster review analysis may be required as part of the application. Contact the appropriate NSR permitting section for assistance at (512) 239-1250. Additional Guidance can be found at:
https://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/disrev-factsheet.pdf

Does this application involve any air contaminants for which a disaster review is required?	No

C. Air Pollutant Watch List

Certain areas of the state have concentrations of specific pollutants that are of concern. The TCEQ has designated these portions of the state as watch list areas. Location of a facility in a watch list area could result in additional restrictions on emissions of the affected air pollutant(s) or additional permit requirements. The location of the areas and pollutants of interest can be found at:
https://www.tceq.texas.gov/toxicology/apwl/apwl.html

Is the proposed facility located in a watch list area?	No

D. Mass Emissions Cap and Trade

Is this facility located at a site within the Houston/Galveston nonattainment area (Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller Counties)?	No

X. Additional Requirements

A. Bulk Fuel Terminals

Is this project for a bulk fuel terminal?	No

B. Plant Fuel Gas Facilities

Does this site utilize plant fuel gas?	No

Texas Commission on Environmental Quality
Form PI-1 General Application
Unit Types - Emission Rates

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Permit primary industry (must be selected for workbook to function)	Mechanical / Agricultural / Construction

Action Requested (only 1 action per FIN)	Include these emissions in annual (tpy) summary?	Facility ID Number (FIN)	Emission Point Number (EPN)	Source Name	Pollutant	Current Short-Term (lb/hr)	Current Long-Term (tpy)	Consolidated Current Short-Term (lb/hr)	Consolidated Current Long-Term (tpy)	Proposed Short-Term (lb/hr)	Proposed Long-Term (tpy)	Short-Term Difference (lb/hr)	Long-Term Difference (tpy)	Unit Type (Used for reviewing BACT and Monitoring Requirements)
New/Modified	Yes	KILN-1	KILN-1	Waelz Kiln	NOx					13.83	60.58	*13.8303*	*60.5764*	Other
					CO					22.71	99.47	*22.7107*	*99.4727*	
					SO2					1.70	7.44	*1.6985*	*7.4392*	
					VOC					2.43	10.63	*2.4264*	*10.6275*	
					PM					2.06	9.01	*2.0568*	*9.0084*	
					PM10					2.06	9.01	*2.0568*	*9.0084*	
					PM2.5					2.06	9.01	*2.0568*	*9.0084*	
					CO2					37468.82	164113.43	*37468.8206*	*164113.4342*	
					CH4					0.17	0.72	*0.1654*	*0.7243*	
					N2O					0.74	3.23	*0.7378*	*3.2312*	
					CO2 Equivalent					37692.79	165094.42	*37692.7904*	*165094.4216*	
					Pb					0.07	0.29	*0.0667*	*0.2919*	
					HAPs					0.17	0.75	*0.1708*	*0.7477*	
New/Modified	Yes	BH-1	BH-1	Building Baghouse	PM					1.47	6.42	*1.4658*	*6.4199*	Control: Bag Filter/Baghouse
					PM10					1.47	6.42	*1.4658*	*6.4199*	
					PM2.5					1.47	6.42	*1.4658*	*6.4199*	
					Pb					0.02	0.09	*0.0198*	*0.0867*	
					HAPs					0.09	0.39	*0.0881*	*0.3859*	
New/Modified	Yes	BH-2	BH-2	Building Baghouse	PM					1.47	6.42	*1.4658*	*6.4199*	Control: Bag Filter/Baghouse
					PM10					1.47	6.42	*1.4658*	*6.4199*	
					PM2.5					1.47	6.42	*1.4658*	*6.4199*	
					Pb					0.02	0.09	*0.0198*	*0.0867*	
					HAPs					0.09	0.39	*0.0881*	*0.3859*	
New/Modified	Yes	BH-3	BH-3	Building Baghouse	PM					0.46	2.03	*0.4629*	*2.0274*	Control: Bag Filter/Baghouse
					PM10					0.46	2.03	*0.4629*	*2.0274*	
					PM2.5					0.46	2.03	*0.4629*	*2.0274*	
					Pb					0.01	0.03	*0.0063*	*0.0274*	
					HAPs					0.03	0.12	*0.0279*	*0.1219*	
New/Modified	Yes	BH-4	BH-4	Building Baghouse	PM					0.46	2.03	*0.4629*	*2.0274*	Control: Bag Filter/Baghouse
					PM10					0.46	2.03	*0.4629*	*2.0274*	
					PM2.5					0.46	2.03	*0.4629*	*2.0274*	
					Pb					0.01	0.03	*0.0063*	*0.0274*	
					HAPs					0.03	0.12	*0.0279*	*0.1219*	
New/Modified	Yes	BVF-1	BVF-1	Bin Vent Filter 1	PM					0.05	0.23	*0.0515*	*0.2253*	Control: Bag Filter/Baghouse
					PM10					0.05	0.23	*0.0515*	*0.2253*	
					PM2.5					0.05	0.23	*0.0515*	*0.2253*	
					Pb					1.67E-03	0.01	*0.0017*	*0.0073*	
					HAPs					4.27E-03	0.02	*0.0043*	*0.0187*	
New/Modified	Yes	BVF-2	BVF-2	Bin Vent Filter 2	PM					0.05	0.23	*0.0515*	*0.2253*	Control: Bag Filter/Baghouse
					PM10					0.05	0.23	*0.0515*	*0.2253*	
					PM2.5					0.05	0.23	*0.0515*	*0.2253*	
					Pb					1.67E-03	0.01	*0.0017*	*0.0073*	
					HAPs					4.27E-03	0.02	*0.0043*	*0.0187*	
New/Modified	Yes	EMGEN1	EMGEN1	Emergency Generator 1	NOx					9.27	0.46	*9.27*	*0.4635*	Engine: Emergency, Diesel
					CO					5.79	0.29	*5.7872*	*0.2894*	
					SO2					0.01	5.43E-04	*0.0109*	*0.0006*	
					VOC					1.31	0.07	*1.3122*	*0.0657*	
					PM					0.33	0.02	*0.3307*	*0.0166*	
					PM10					0.33	0.02	*0.3307*	*0.0166*	
					PM2.5					0.33	0.02	*0.3307*	*0.0166*	
					CO2					1147.96	57.40	*1147.9591*	*57.398*	
					CH4					0.05	2.33E-03	*0.0466*	*0.0024*	
					N2O					0.01	4.66E-04	*0.0094*	*0.0005*	
					CO2 Equivalent					1151.90	57.59	*1151.8984*	*57.595*	
					HAPs					1.31	0.07	*1.3122*	*0.0657*	
New/Modified	Yes	T1	T1	Diesel Tank	VOC					0.38	0.02	*0.384*	*0.019*	Storage: Tank: Chrome
New/Modified	Yes	WIP1	WIPB	Kiln Drop to Conveyor	PM					0.12	0.39	*0.1236*	*0.3937*	Material Handling: Conveyor
					PM10					0.06	0.19	*0.0585*	*0.1862*	
					PM2.5					0.01	0.03	*0.0089*	*0.0282*	
New/Modified	Yes	WIP2	WIPB	Conveyor to Building	PM					0.12	0.39	*0.1236*	*0.3937*	Material Handling: Drop Point
					PM10					0.06	0.19	*0.0585*	*0.1862*	
					PM2.5					0.01	0.03	*0.0089*	*0.0282*	
New/Modified	Yes	WIP3	WIPB	WIP Building to Truck	PM					0.12	0.39	*0.1236*	*0.3937*	Material Handling: Product Handling
					PM10					0.06	0.19	*0.0585*	*0.1862*	
					PM2.5					0.01	0.03	*0.0089*	*0.0282*	

Texas Commission on Environmental Quality
Form PI-1 General Application
Stack Parameters

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Emission Point Discharge Parameters												
EPN	Included in EMEW?	UTM Coordinates Zone	East (Meters)	North (Meters)	Building Height (ft)	Height Above Ground (ft)	Stack Exit Diameter (ft)	Velocity (FPS)	Temperature (°F)	Fugitives - Length (ft)	Fugitives - Width (ft)	Fugitives - Axis Degrees
KILN-1	Yes											
BH-1	Yes											
BH-2	Yes											
BH-3	Yes											
BH-4	Yes											
BVF-1	Yes											
BVF-2	Yes											
EMGEN1	Yes											
T1	Yes											
WIPB	Yes											

Texas Commission on Environmental Quality
Form PI-1 General Application
Public Notice

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

I. Public Notice Applicability

A. Application Type

Is this an application for an initial permit?	Yes

B. Project Increases and Public Notice Thresholds (for Initial and Amendment Projects)

Pollutant			**Proposed Long-Term (tpy)**			
VOC			10.71			
PM			27.55			
PM_{10}			26.93			
$PM_{2.5}$			26.45			
NO_x			61.04			
CO			99.76			
SO_2			7.44			
Pb			0.53			
CO2			164170.8321			
CH4			0.726546734			
N2O			3.231613181			
CO2 Equivalent			165152.0165			
HAPs			1.866044274			

* Notice is required for PM, PM10, and PM2.5 if one of these pollutants is above the threshold.

** Notice of a GHG action is determined by action type. Initial and major modification always require notice. Voluntary updates require a consolidated notice if there is a change to BACT. Project emission increases of CO2e (CO2 equivalent) are not relevant for determining public notice of GHG permit actions.

C. Is public notice required for this project as represented in this workbook? If no, proceed to Section III Small Business Classification. Note: public notice applicability for this project may change throughout the technical review.	Yes
D. Are any HAPs to be authorized/re-authorized with this project? The category "HAPs" must be specifically listed in the public notice if the project authorizes (reauthorizes for renewals) any HAP pollutants.	Yes

II. Public Notice Information

Complete this section if public notice is required (determined in the above section) or if you are not sure if public notice is required.

A. Contact Information

Enter the contact information for the **person responsible for publishing.** This is a designated representative who is responsible for ensuring public notice is properly published in the appropriate newspaper and signs are posted at the facility site. This person will be contacted directly when the TCEQ is ready to authorize public notice for the application.

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Ron
Last Name:	Crittendon
Title:	CEO
Company Name:	Zinc Resources LLC
Mailing Address:	109 N Post Oak Ln #415
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77024
Telephone Number:	832-350-6800
Fax Number:	866-260-0127
Email Address:	Rcrittendon@zincresources.com

Enter the contact information for the **Technical Contact.** This is the designated representative who will be listed in the public notice as a contact for additional information.

Prefix (Mr., Ms., Dr., etc.):	Mr.
First Name:	Tom
Last Name:	Knepper
Title:	Executive Vice President & Project Manager
Company Name:	Zinc Resources LLC
Mailing Address:	109 N Post Oak Ln #415
Address Line 2:	
City:	Houston
State:	TX
ZIP Code:	77024
Telephone Number:	724-650-3618
Fax Number:	713-682-9531
Email Address:	Tknepper@zincresources.com

B. Public place

Place a copy of the full application (including all of this workbook and all attachments) at a public place in the county where the facilities are or will be located. You must state where in the county the application will be available for public review and comment. The location must be a public place and described in the notice. A public place is a location which is owned and operated by public funds (such as libraries, county courthouses, city halls) and cannot be a commercial enterprise. You are required to pre-arrange this availability with the public place indicated below. The application must remain available from the first day of publication through the designated comment period.

If this is an application for a PSD, nonattainment, or FCAA §112(g) permit, the public place must have internet access available for the public as required in 30 TAC § 39.411(f)(3).

If the application is submitted to the agency with information marked as Confidential, you are required to indicate which specific portions of the application are not being made available to the public. These portions of the application must be accompanied with the following statement: ***Any request for portions of this application that are marked as confidential must be submitted in writing, pursuant to the Public Information Act, to the TCEQ Public Information Coordinator, MC 197, P.O. Box 13087, Austin, Texas 78711-3087.***

Name of Public Place:	Victoria Public Library
Physical Address:	302 N Main St.
Address Line 2:	
City:	Victoria

ZIP Code:	77901
County:	Victoria
Has the public place granted authorization to place the application for public viewing and copying?	Yes

C. Alternate Language Publication

In some cases, public notice in an alternate language is required. If an elementary or middle school nearest to the facility is in a school district required by the Texas Education Code to have a bilingual program, a bilingual notice will be required. If there is no bilingual program required in the school nearest the facility, but children who would normally attend those schools are eligible to attend bilingual programs elsewhere in the school district, the bilingual notice will also be required. If it is determined that alternate language notice is required, you are responsible for ensuring that the publication in the alternate language is complete and accurate in that language.

Is a bilingual program required by the Texas Education Code in the School District?	Yes
Are the children who attend either the elementary school or the middle school closest to your facility eligible to be enrolled in a bilingual program provided by the district?	Yes
If yes to either question above, list which language(s) are required by the bilingual program?	Spanish

III. Small Business Classification	
Complete this section to determine small business classification. If a small business requests a permit, agency rules (30 TAC § 39.603(f)(1)(A)) allow for alternative public notification requirements if all of the following criteria are met. If these requirements are met, public notice does not have to include publication of the prominent (12 square inch) newspaper notice.	
Does the company (including parent companies and subsidiary companies) have fewer than 100 employees or less than $6 million in annual gross receipts?	Yes
Is the site a major source under 30 TAC Chapter 122, Federal Operating Permit Program?	No
Are the site emissions of any individual air contaminant greater than or equal to 50 tpy?	Yes
Small business classification:	**No**

Texas Commission on Environmental Quality
Form PI-1 General Application
Federal Applicability

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

I. County Classification	
Does the project require retrospective review?	No
County (completed for you from your response on the General sheet)	Victoria
This project will be located in an area that is in attainment for ozone as of Sept. 23, 2019. Select from the drop-down list to the right if you would like the project to be reviewed under a different classification.	
Determination:	**This project will be located in an area that is in attainment or unclassified for all pollutants. Nonattainment review is not required.**

II. PSD and GHG PSD Applicability Summary			
Is netting required for the PSD analysis for this project?			**No**
Pollutant	**Project Increase**	**Threshold**	**PSD Review Required?**
CO	99.76	250	No
NO_x	61.04	250	No
PM	27.55	250	No
PM_{10}	26.93	250	No
$PM_{2.5}$	26.45	250	No
SO_2	7.44	250	No
Ozone (as VOC)	10.71	250	No
Ozone (as NOx)			
Pb	0.53	0.6	No
H_2S			
TRS			
Reduced sulfur compounds (including H_2S)			
H_2SO_4			
Fluoride (excluding HF)			
CO2e	165,152	N/A	No

Texas Commission on Environmental Quality
Form PI-1 General Application
Fees

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

I. General Information - Non-Renewal	
Is this project for new facilities controlled and operated directly by the federal government? (30 TAC § 116.141(b)(1) and 30 TAC § 116.163(a))	No
A fee of $75,000 shall be required if no estimate of capital project cost is included with the permit application. (30 TAC § 116.141(d)) Select "yes" here to use this option. Then skip sections II and III.	No
Select Application Type	Minor Application

II. Direct Costs - Non-Renewal	
Type of Cost	**Amount**
Process and control equipment not previously owned by the applicant and not currently authorized under this chapter.	$50,000,000.00
Auxiliary equipment, including exhaust hoods, ducting, fans, pumps, piping, conveyors, stacks, storage tanks, waste disposal facilities, and air pollution control equipment specifically needed to meet permit and regulation requirements.	$0.00
Freight charges.	$0.00
Site preparation, including demolition, construction of fences, outdoor lighting, road, and parking areas.	$0.00
Installation, including foundations, erection of supporting structures, enclosures or weather protection, insulation and painting, utilities and connections, process integration, and process control equipment.	$0.00
Auxiliary buildings, including materials storage, employee facilities, and changes to existing structures.	$0.00
Ambient air monitoring network.	$0.00
Sub-Total:	$50,000,000.00

III. Indirect Costs - Non-Renewal	
Type of Cost	**Amount**
Final engineering design and supervision, and administrative overhead.	$0.00
Construction expense, including construction liaison, securing local building permits, insurance, temporary construction facilities, and construction clean-up.	$0.00
Contractor's fee and overhead.	$0.00
Sub-Total:	$0.00

IV. Calculations - Non-Renewal
For GHG permits: A single PSD fee (calculated on the capital cost of the project per 30 TAC § 116.163) will be required for all of the associated permitting actions for a GHG PSD project. Other NSR permit fees related to the project that have already been remitted to the TCEQ can be subtracted when determining the appropriate fee to submit with the GHG PSD application. Identify these other fees in the GHG PSD permit application.
In signing the "General" sheet with this fee worksheet attached, I certify that the total estimated capital cost of the project as defined in 30 TAC §116.141 is equal to or less than the above figure. I further state that I have read and understand Texas Water Code § 7.179, which defines Criminal Offenses for certain violations, including intentionally or knowingly making, or causing to be made, false material statements or representations.

Estimated Capital Cost	**Minor Application Fee**	
Less than $300,000	$900 (minimum fee)	
$300,000 - $7,500,000	N/A	
$300,000 - $25,000,000	0.30% of capital cost	
Greater than $7,500,000	N/A	
Greater than $25,000,000	$75,000 (maximum fee)	

Your estimated capital cost:	**$50,000,000.00**	Maximum fee applies.
Permit Application Fee:		**$75,000.00**

VI. Total Fees	
Note: fees can be paid together with one payment or as two separate payments.	
Non-Renewal Fee	$75,000.00
Total	$75,000.00

VII. Payment Information	
A. Payment One (required)	
Was the fee paid online?	Yes
Enter the fee amount:	$ 75,000.00
Enter the check, money order, ePay Voucher, or other transaction number:	487590
Enter the Company name as it appears on the check:	
C. Total Paid	**$75,000.00**

VIII. Professional Engineer Seal Requirement	
Is the estimated capital cost of the project above $2 million?	Yes
Is this project subject to an exemption contained in the Texas Engineering Practice Act (TEPA)? (30 TAC § 116.110(f))	No
Is the application required to be submitted under the seal of a Texas licensed P.E.? Note: an electronic PE seal is acceptable.	Yes

Texas Commission on Environmental Quality
Form PI-1 General Application
Impacts

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes	Additional Notes (optional)
VOC	No	MERA steps 0-2 AND Modeling (screen or refined)	Attach both an "Electronic Modeling Evaluation Workbook" (EMEW) AND a detailed description of which MERA step was met. Include speciated emission rates with the total VOC and/or PM species corresponding to the short-term and long-term differences represented on the Unit Types-Emission Rates sheet.	
NOx	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
CO	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
SO2	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
PM	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
PM10	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
PM2.5	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	

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Company: Zinc Resources LLC

Pollutant	Does this pollutant require PSD review?	How will you demonstrate that this project meets all applicable requirements?	Notes	Additional Notes (optional)
CO2	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
CH4	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
N2O	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
CO2 Equivalent	No	Not applicable	This pollutant is not a part of this project or does not require an impacts analysis.	
Pb	No	Modeling: screen or refined	Attach a completed "Electronic Modeling Evaluation Workbook" (EMEW).	
HAPs	No	MERA steps 0-2 AND Modeling (screen or refined)	Attach both an "Electronic Modeling Evaluation Workbook" (EMEW) AND a detailed description of which MERA step was met. Include speciated emission rates with the total VOC and/or PM species corresponding to the short-term and long-term differences represented on the Unit Types-Emission Rates sheet.	

Texas Commission on Environmental Quality
Form PI-1 General Application
BACT

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	KILN-1	Waelz Kiln	NOx	See additional notes:	Yes	Good Combustion Practices. Please see section 5 in the attached application for more details.
			CO	See additional notes:	Yes	Good Combustion Practices. Please see section 5 in the attached application for more details.
			SO2	See additional notes:	Yes	Use of low-sulfur fuels fuel for supplemental burner to minimize additional formation of SO2. Please see section 5 in the attached application for more details.
			VOC	See additional notes:	Yes	Good Combustion Practices. Please see section 5 in the attached application for more details.
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:	Yes	Baghouse with outlet grain loading rate of 0.003 gr/dscf
			CO2	See additional notes:	Yes	Not Applicable
			CH4	See additional notes:	Yes	Not Applicable
			N2O	See additional notes:	Yes	Not Applicable
			CO2 Equivalent	See additional notes:	Yes	Not Applicable
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.
			MSS	See additional notes:	Yes	Use of pipeline quality natural gas or ULSD fuel and good combustion practices during startup operations.
New/Modified	BH-1	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation. Removal of spent filters in such a manner to minimize PM emissions and placing the spent filters in sealable bags or other sealable containers prior to removal from the site. Bags or containers shall be kept closed at all times except when adding spent filters.	Yes	
New/Modified	BH-2	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.

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BACT

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Company: Zinc Resources LLC

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation. Removal of spent filters in such a manner to minimize PM emissions and placing the spent filters in sealable bags or other sealable containers prior to removal from the site. Bags or containers shall be kept closed at all times except when adding spent filters.	Yes	
New/Modified	BH-3	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation. Removal of spent filters in such a manner to minimize PM emissions and placing the spent filters in sealable bags or other sealable containers prior to removal from the site. Bags or containers shall be kept closed at all times except when adding spent filters.	Yes	
New/Modified	BH-4	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation. Removal of spent filters in such a manner to minimize PM emissions and placing the spent filters in sealable bags or other sealable containers prior to removal from the site. Bags or containers shall be kept closed at all times except when adding spent filters.	Yes	
New/Modified	BVF-1	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:	Yes	Follow techniques for PM control.
			HAPs	See additional notes:	Yes	Follow techniques for PM control.

Texas Commission on Environmental Quality
Form PI-1 General Application
BACT

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation. Removal of spent filters in such a manner to minimize PM emissions and placing the spent filters in sealable bags or other sealable containers prior to removal from the site. Bags or containers shall be kept closed at all times except when adding spent filters.	Yes	
New/Modified	BVF-2	Control: Bag Filter/Baghouse	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Opacity shall not exceed 5% and/or no visible emissions from each stack or vent. 99% reduction or outlet grain loading of 0.01 gr/dscf.	Yes	
			Pb	See additional notes:		Follow techniques for PM control.
			HAPs	See additional notes:		Follow techniques for PM control.
			MSS	Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation	Yes	
New/Modified	EMGEN1	Engine: Emergency, Diesel	NOx	Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs./yr. of non-emergency operation. Have a non-resettable runtime meter.	Yes	
			CO	Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs./yr. of non-emergency operation. Have a non-resettable runtime meter.		
			SO2	Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs./yr. of non-emergency operation. Have a non-resettable runtime meter.		
			VOC	Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs./yr. of non-emergency operation. Have a non-resettable runtime meter.		
			PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Meeting the requirements of 40 CFR Part 60, Subpart IIII. Firing ultra-low sulfur diesel fuel (no more than 15 ppm sulfur by weight). Limited to 100 hrs./yr. of non-emergency operation. Have a non-resettable runtime meter. No visible emissions shall leave the property. Visible emissions shall be determined by a standard of no visible emissions exceeding 30 seconds in duration in any six-minute period as determined using EPA TM 22 or equivalent		
			CO2	See additional notes:		Not Applicable
			CH4	See additional notes:		Not Applicable
			N2O	See additional notes:		Not Applicable
			CO2 Equivalent	See additional notes:		Not Applicable
			HAPs	See additional notes:		Good combustion practices, use of ultra low sulfur diesel (no more than 15 ppm of sulfur by weight) and limited to 100 hours/yr operation.

Texas Commission on Environmental Quality
Form PI-1 General Application
BACT

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Company: Zinc Resources LLC

Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
			MSS	Minimize duration and occurrence of MSS activities.	Yes	
New/Modified	T1	Storage: Tank: Chrome	VOC	See Additional Notes:	Yes	Storage Tank (1): Fixed roof with capacity < 25,000 gal or TVP < 0.50 psia
			MSS	See Additional Notes:	Yes	Not Applicable
New/Modified	WIP1	Material Handling: Conveyor	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Grain elevator: Mechanical conveying: enclosed conveying or equivalent. Pneumatic conveying: 99% reduction, outlet grain loading ≤ 0.01 gr/dscf. Typically achieved with a baghouse. Specify technique. Iron and steel raw materials: 99% reduction, outlet grain loading ≤ 0.01 gr/dscf, typically achieved when dry powdery materials are conveyed by pneumatic or enclosed system and stored in silos with emissions exhausted to a fabric filter. Provide technique. Maximum of 5% opacity at stack Coal handling: 90% reduction, typically enclosed (50-90% reduction); chemical sprays (80-90% reduction; or full enclosure (90+%). Specify technique. Rock/aggregate: 70% reduction, typically water sprays	Yes	Material Handling Emissions are enclosed.
			MSS	Best management practices (conducting system maintenance in a manner which minimizes emissions) employed during handling system maintenance. No bypassing of controls. Fabric filters should be in good repair with an acceptable pressure drop prior to the start of operation.	Yes	

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BACT

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Action Requested	FINs	Unit Type	Pollutant	Current Tier I BACT	Confirm	Additional Notes
New/Modified	WIP2	Material Handling: Drop Point	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. Concrete: Truck drop 99% reduction or 0.01 gr/dscf, suction shroud, minimum 4000 acfm Rock/aggregate: 70% reduction, typically water sprays		
			MSS	Best management practices (conducting system maintenance in a manner which minimizes emissions) employed during handling system maintenance. No bypassing of controls. Suction shroud should be in good repair with minimum flow rate.		
New/Modified	WIP3	Material Handling: Product Handling	PM	The emission reduction techniques for PM10 and PM2.5 will follow the technique for PM. See Additional Notes:		Follow techniques for PM control.
			MSS	Best management practices (conducting system maintenance in a manner which minimizes emissions) employed during handling system maintenance. No bypassing of controls.		

Texas Commission on Environmental Quality
Form PI-1 General Application
Monitoring

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

FIN	Unit Type	Pollutant	Minimum Monitoring Requirements	Confirm	Additional Notes for Monitoring	Proposed Measurement Technique (only complete for pollutants with a project increase above the PSD threshold)	Additional Notes for Measuring:
KILN-1	Waelz Kiln	NOx	See additional notes:	Yes	Initial Method 7 stack test		
		CO	See additional notes:	Yes	Initial Method 10 stack test		
		SO2	See additional notes:	Yes	Combustion of pipeline quality natural gas or ULSD		
		VOC	See additional notes:	Yes	Initial Method 25A stack test		
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. See additional notes:	Yes	Continuous opacity monitor, pressure drop monitoring, initial Method 5 stack test.		
		CO2	See additional notes:	Yes	Monitor process throughput		
		CH4	See additional notes:	Yes	Monitor process throughput		
		N2O	See additional notes:	Yes	Monitor process throughput		
		CO2 Equivalent	See additional notes:	Yes	Monitor process throughput		
		Pb	See additional notes:	Yes	Initial Method 29 stack test, follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BH-1	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Pressure drop monitoring and/or quarterly visible emissions and/or opacity observations.	Yes			
		Pb	See additional notes:	Yes	Follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BH-2	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Pressure drop monitoring and/or quarterly visible emissions and/or opacity observations.	Yes			
		Pb	See additional notes:	Yes	Follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BH-3	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow	Yes			
		Pb	See additional notes:	Yes	Follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BH-4	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow	Yes			
		Pb	See additional notes:	Yes	Follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BVF-1	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow	Yes			
		Pb	See additional notes:	Yes	Follow procedures for PM		
		HAPs	See additional notes:	Yes	Follow procedures for PM		
BVF-2	Control: Bag Filter/Baghouse	PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Pressure drop monitoring and/or quarterly	Yes			
		Pb	See additional notes:		Follow procedures for PM		
		HAPs	See additional notes:		Follow procedures for PM		

EMGEN1	Engine: Emergency, Diesel	NOx	Recordkeeping of hours of operation	Yes			
		CO	Recordkeeping of hours of operation				
		SO2	Recordkeeping of hours of operation				
		VOC	Recordkeeping of hours of operation				
		PM	The emission monitoring techniques for PM10 and PM2.5 will follow				
		CO2	See additional notes:		Recordkeeping of hours of operation		
		CH4	See additional notes:		Recordkeeping of hours of operation		
		N2O	See additional notes:		Recordkeeping of hours of operation		
		CO2 Equivalent	See additional notes:		Recordkeeping of hours of operation		
		HAPs	See additional notes:		Recordkeeping of hours of operation		
T1	Storage: Tank: Chrome	VOC	See Additional Notes:	Yes	Monitor Throughput		
WIP1	Material Handling: Conveyor	PM	The emission monitoring techniques for PM10 and PM2.5 will follow the technique for PM. Quarterly observations for visible fugitive emissions and/or opacity observations	Yes			
WIP2	Material Handling: Drop	PM	The emission monitoring techniques for PM10 and PM2.5 will follow	Yes			
WIP3	Material Handling: Product	PM	The emission monitoring techniques for PM10 and PM2.5 will follow	Yes			

Texas Commission on Environmental Quality
Form PI-1 General Application
Materials

Date: 3/16/2021
Permit #: TBD
Company: Zinc Resources LLC

Item	How submitted	Date submitted
A. Administrative Information		
Form PI-1 General Application	STEERS	03/16/2021
Hard copy of the General sheet with original (ink) signature	Not applicable	
Professional Engineer Seal	STEERS	03/16/2021
B. General Information		
Copy of current permit (both Special Conditions and MAERT)		
Core Data Form	STEERS	03/16/2021
Area map	STEERS	03/16/2021
Plot plan	STEERS	03/16/2021
Process description	STEERS	03/16/2021
Process flow diagram	STEERS	03/16/2021
List of MSS activities	STEERS	03/16/2021
State regulatory requirements discussion	STEERS	03/16/2021
C. Federal Applicability		
Summary and project emission increase determination - Tables 1F and 2F	Not applicable	
Netting analysis (if required) - Tables 3F and 4F as needed	Not applicable	
D. Technical Information		
BACT discussion, if additional details are attached	STEERS	03/16/2021
Monitoring information, if additional details are attached	STEERS	03/16/2021
Material Balance (if applicable)		
Calculations	STEERS	03/16/2021
E. Impacts Analysis		
Qualitative impacts analysis	Not applicable	
MERA analysis	STEERS	03/16/2021
Electronic Modeling Evaluation Workbook: SCREEN3	Not applicable	
Electronic Modeling Evaluation Workbook: NonSCREEN3	STEERS	03/16/2021
PSD modeling protocol	Not applicable	
F. Additional Attachments		
Modeled Sources & Building Downwash Structures	STEERS	03/16/2021
Fabric Filters - Table 11(TCEQ Form - 10179)	STEERS	03/16/2021
Expedited Permitting Request Form (Form APD-EXP)	STEERS	03/16/2021
Horizontal Fixed Roof Storage Tank Table 7b	STEERS	03/16/2021
Reciprocating Engines Table 29	STEERS	03/16/2021

APPENDIX C. EMISSION CALCULATIONS

Zinc Resources | Recycling Plant
Table C-1. Emission Summary

EPN	FIN	Description	Pollutant	Hourly (lb/hr)	Annual (tpy)
KILN-1	KILN-1	Waelz Kiln	NO_X	13.83	60.58
			CO	22.71	99.47
			SO_2	1.70	7.44
			VOC	2.43	10.63
			PM	2.06	9.01
			PM_{10}	2.06	9.01
			$PM_{2.5}$	2.06	9.01
			CO_2	37,469	164,113
			CH_4	0.17	0.72
			N_2O	0.74	3.23
			CO2e	37,693	165,094
			Pb	0.07	0.29
			HAP	0.17	0.75
BH-1	BH-1	Mix Building - West	PM	1.47	6.42
			PM_{10}	1.47	6.42
			$PM_{2.5}$	1.47	6.42
			Pb	0.02	0.09
			HAP	0.09	0.39
BH-2	BH-2	Mix Building - East	PM	1.47	6.42
			PM_{10}	1.47	6.42
			$PM_{2.5}$	1.47	6.42
			Pb	0.02	0.09
			HAP	0.09	0.39
BH-3	BH-3	Railroad Unloading - West	PM	0.46	2.03
			PM_{10}	0.46	2.03
			$PM_{2.5}$	0.46	2.03
			Pb	0.01	0.03
			HAP	0.03	0.12
BH-4	BH-4	Railroad Unloading - East	PM	0.46	2.03
			PM_{10}	0.46	2.03
			$PM_{2.5}$	0.46	2.03
			Pb	0.01	0.03
			HAP	0.03	0.12
BVF-1	BVF-1	Bin Vent Filter 1	PM	0.05	0.23
			PM_{10}	0.05	0.23
			$PM_{2.5}$	0.05	0.23
			Pb	1.67E-03	0.01
			HAP	4.27E-03	0.02

Zinc Resources | Recycling Plant
Table C-1. Emission Summary

EPN	FIN	Description	Pollutant	Hourly (lb/hr)	Annual (tpy)
BVF-2	BVF-2	Bin Vent Filter 2	PM	0.05	0.23
			PM_{10}	0.05	0.23
			$PM_{2.5}$	0.05	0.23
			Pb	1.67E-03	0.01
			HAP	4.27E-03	0.02
EMGEN1	EMGEN1	Emergency Generator 1	NO_X	9.27	0.46
			CO	5.79	0.29
			SO_2	0.01	5.43E-04
			VOC	1.31	0.07
			PM	0.33	0.02
			PM_{10}	0.33	0.02
			$PM_{2.5}$	0.33	0.02
			CO_2	1,148	57.40
			CH_4	0.05	2.33E-03
			N_2O	0.01	4.66E-04
			CO2e	1,152	57.59
			HAP	1.31	0.07
T1	T1	Diesel Tank	VOC	0.38	0.02
WIPB	WIP1	Kiln Drop to Conveyor	PM	0.12	0.39
			PM_{10}	0.06	0.19
			$PM_{2.5}$	0.01	0.03
WIPB	WIP2	Conveyor to Building	PM	0.12	0.39
			PM_{10}	0.06	0.19
			$PM_{2.5}$	0.01	0.03
WIPB	WIP3	WIP Building to Truck	PM	0.12	0.39
			PM_{10}	0.06	0.19
			$PM_{2.5}$	0.01	0.03
All	**All**	**Total Sum**	**NO_X**	**23.10**	**61.04**
			CO	**28.50**	**99.76**
			SO_2	**1.71**	**7.44**
			VOC	**4.12**	**10.71**
			PM	**6.72**	**27.55**
			PM_{10}	**6.52**	**26.93**
			$PM_{2.5}$	**6.37**	**26.45**
			CO_2	**38,616.78**	**164,170.83**
			CH_4	**0.21**	**0.73**
			N_2O	**0.75**	**3.23**
			CO2e	**38,844.69**	**165,152.02**
			Pb	**0.12**	**0.53**
			HAP	**1.72**	**1.87**

Zinc Resources | Recycling Plant
Table C-2. Baghouse Emissions Calculation

Baghouse Emissions

EPN	FIN	Description	Flow Rate[1] (dscfm)	Emission Factor[2]				Hourly Emissions[3]				Annual Emissions			
				PM (gr/dscf)	PM_{10} (gr/dscf)	$PM_{2.5}$ (gr/dscf)	Pb (wt%)	PM (lb/hr)	PM_{10} (lb/hr)	$PM_{2.5}$ (lb/hr)	Pb (lb/hr)	PM (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	Pb (tpy)
KILN-1	KILN-1	Waelz Kiln	79,983	3.00E-03	3.00E-03	3.00E-03	3.24	2.06	2.06	2.06	0.07	9.01	9.01	9.01	0.29
BH-1	BH-1	Mix Building - West	57,000	3.00E-03	3.00E-03	3.00E-03	1.35	1.47	1.47	1.47	0.02	6.42	6.42	6.42	0.09
BH-2	BH-2	Mix Building - East	57,000	3.00E-03	3.00E-03	3.00E-03	1.35	1.47	1.47	1.47	0.02	6.42	6.42	6.42	0.09
BH-3	BH-3	Railroad Unloading - West	18,000	3.00E-03	3.00E-03	3.00E-03	1.35	0.46	0.46	0.46	0.01	2.03	2.03	2.03	0.03
BH-4	BH-4	Railroad Unloading - East	18,000	3.00E-03	3.00E-03	3.00E-03	1.35	0.46	0.46	0.46	0.01	2.03	2.03	2.03	0.03
BVF-1	BVF-1	Bin Vent Filter 1	2,000	3.00E-03	3.00E-03	3.00E-03	3.24	0.05	0.05	0.05	1.67E-03	0.23	0.23	0.23	0.01
BVF-2	BVF-2	Bin Vent Filter 2	2,000	3.00E-03	3.00E-03	3.00E-03	3.24	0.05	0.05	0.05	1.67E-03	0.23	0.23	0.23	0.01

[1] Exit loading flow rate in dry standard cubic feet per minute (dscfm) based on process design parameters and manufacturer guarantees.

[2] Emission factors based on TCEQ Tier 1 BACT.

[3] Emission calculations use 1 lb = 7000 grain to convert from emission factors.

Metal HAPs Emissions

Element	Weight Percent (wt%)							Hourly Emissions (lb/hr)[1]							Annual Emissions (tpy)[2]						
	KILN-1	BH-1	BH-2	BH-3	BH-4	BVF-1	BVF-2	KILN-1	BH-1	BH-2	BH-3	BH-4	BVF-1	BVF-2	KILN-1	BH-1	BH-2	BH-3	BH-4	BVF-1	BVF-2
Cd	0.16	0.06	0.06	0.06	0.06	0.16	0.16	3.29E-03	8.79E-04	8.79E-04	2.78E-04	2.78E-04	8.23E-05	8.23E-05	0.01	3.85E-03	3.85E-03	1.22E-03	1.22E-03	3.60E-04	3.60E-04
Cl	4.70	1.80	1.80	1.80	1.80	4.70	4.70	0.10	0.03	0.03	0.01	0.01	2.42E-03	2.42E-03	0.42	0.12	0.12	0.04	0.04	0.01	0.01
Mn	0.20	2.80	2.80	2.80	2.80	0.20	0.20	4.11E-03	0.04	0.04	0.01	0.01	1.03E-04	1.03E-04	0.02	0.18	0.18	0.06	0.06	4.51E-04	4.51E-04

[1] Hourly Emissions (lb/hr) = PM Emissions (lb/hr) x Element Weight Percent (wt%)

$$\text{KILN-1 Cd Hourly Emissions (lb/hr)} = \frac{2.06 \text{ lb}}{\text{hr}} \left| \frac{0.16 \text{ wt\%}}{} \right. = 3.29\text{E-}03 \text{ lb/hr}$$

[2] Annual Emissions (tpy) = PM Emissions (tpy) x Element Weight Percent (wt%)

$$\text{KILN-1 Cd Annual Emissions (tpy)} = \frac{9.01 \text{ ton}}{\text{yr}} \left| \frac{0.16 \text{ wt\%}}{} \right. = 0.01 \text{ tpy}$$

Zinc Resources | Recycling Plant
Table C-3. Waelz Kiln Emissions Calculation

Natural Gas Emission Factors

EPN	FIN	Description	Max Capacity	NG Emission Factors[1,2]						
			Hourly (MMBtu/hr)	NO_X (lb/MMBtu)	CO (lb/MMBtu)	SO_2 (lb/MMBtu)	VOC (lb/MMBtu)	CO_2 (lb/MMBtu)	CH_4 (lb/MMBtu)	N_2O (lb/MMBtu)
KILN-1	KILN-1	Waelz Kiln	75.00	0.010	0.082	0.001	0.005	116.977	0.002	2.20E-04

[1] Emission factor is based on AP-42 Section 1.4, Tables 1.4-1 and 1.4-2 (July 1998) and converted to lb/MMBtu using natural gas heating value of 1,020 btu/scf.

[2] Emission factors of GHGs are based on Tables C-1 and C-2 of 40 CFR Part 98.

Fuel Oil No. 2 Emission Factors

EPN	FIN	Description	Max Capacity	Fuel Oil Emission Factors[1]						
			Hourly (MMBtu/hr)	NO_X (lb/MMBtu)	CO (lb/MMBtu)	SO_2 (lb/MMBtu)	VOC (lb/MMBtu)	CO_2 (lb/MMBtu)	CH_4 (lb/MMBtu)	N_2O (lb/MMBtu)
KILN-1	KILN-1	Waelz Kiln	75.00	0.072	0.036	0.000	0.001	161.594	3.77E-04	1.88E-03

[1] Emission factor is based on AP-42 Section 1.3, Tables 1.3-1 and 1.3-12 (May 2010) and converted to lb/MMBtu using Fuel Oil No. 2 heating value of 0.138 MMBtu/gal.

Propane Emission Factors

EPN	FIN	Description	Max Capacity	Propane Emission Factors[1]						
			Hourly (MMBtu/hr)	NO_X (lb/MMBtu)	CO (lb/MMBtu)	SO_2 (lb/MMBtu)	VOC (lb/MMBtu)	CO_2 (lb/MMBtu)	CH_4 (lb/MMBtu)	N_2O (lb/MMBtu)
KILN-1	KILN-1	Waelz Kiln	75.00	0.142	0.082	0.001	0.011	136.612	2.19E-03	9.84E-03

[1] Emission factor is based on AP-42 Section 1.5, Tables 1.5 (June 2008) and converted to lb/MMBtu using Propane heating value of 91.5 MMBtu/10^3 gal.

CO_2e Potential

Global Warming Potentials (GWPs)[1]		
CO_2	CH_4	N_2O
1	25	298

[1] Global Warming Potentials obtained from 40 CFR Appendix Table A-1 to Subpart A of Part 98 - Global Warming Potentials.

Natural Gas Hourly Emissions Calculation

EPN	FIN	Description	Hourly Emissions[1]							
			NO_X (lb/hr)	CO (lb/hr)	SO_2[3] (lb/hr)	VOC (lb/hr)	CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)
KILN-1	KILN-1	Waelz Kiln	0.750	6.176	0.044	0.404	8773	0.165	0.017	8782

[1] Hourly Emissions (lb/hr) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu)

$$NO_x \text{ Hourly Emissions (lb/hr)} = \frac{75.00 \text{ MMBtu}}{\text{hr}} \left| \frac{0.010 \text{ lb}}{\text{MMBtu}} \right. = 0.750 \text{ lb/hr}$$

Fuel Oil No. 2 Hourly Emissions Calculation

EPN	FIN	Description	Hourly Emissions[1]							
			NO_X (lb/hr)	CO (lb/hr)	SO_2[3] (lb/hr)	VOC (lb/hr)	CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)
KILN-1	KILN-1	Waelz Kiln	5.435	2.717	0.001	0.109	12120	0.028	0.141	12162

[1] Hourly Emissions (lb/hr) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu)

$$NO_x \text{ Hourly Emissions (lb/hr)} = \frac{75.00 \text{ MMBtu}}{\text{hr}} \left| \frac{0.072 \text{ lb}}{\text{MMBtu}} \right. = 5.435 \text{ lb/hr}$$

Zinc Resources | Recycling Plant
Table C-3. Waelz Kiln Emissions Calculation

Propane Hourly Emissions Calculation

EPN	FIN	Description	Hourly Emissions[1]							
			NO_X (lb/hr)	CO (lb/hr)	SO_2[3] (lb/hr)	VOC (lb/hr)	CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)
KILN-1	KILN-1	Waelz Kiln	10.656	6.148	0.044	0.820	10245.902	0.164	0.738	10470

[1] Hourly Emissions (lb/hr) = Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu)

$$NO_x \text{ Hourly Emissions (lb/hr)} = \frac{75.00 \text{ MMBtu}}{\text{hr}} \left| \frac{0.142 \text{ lb}}{\text{MMBtu}} \right. = 10.656 \text{ lb/hr}$$

Maximum Hourly Combustion Emissions Calculation

EPN	FIN	Description	Hourly Emissions[1]							
			NO_X (lb/hr)	CO (lb/hr)	SO_2[3] (lb/hr)	VOC (lb/hr)	CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)
KILN-1	KILN-1	Waelz Kiln	10.656	6.176	0.044	0.820	12120	0.165	0.738	12162

[1] Only natural gas or fuel oil no. 2 will be used in any given hour; therefore, the maximum of the two is represented as maximum hourly combustion emissions.

Process Weight Hourly Emissions

EPN	FIN	Description	Total Feed	Process Weight Emission Factors				Hourly Emissions[1]			
			Hourly (ton/hr)	NO_X (lb/ton)	CO (lb/ton)	SO_2 (lb/ton)	VOC (lb/ton)	NO_X (lb/hr)	CO (lb/hr)	SO_2 (lb/hr)	VOC (lb/hr)
KILN-1	KILN-1	Waelz Kiln	24.26	0.57	0.936	0.07	0.1	13.83	22.71	1.70	2.43

[1] Hourly Emissions based on project engineering design and review of industry emission factors for other Waelz Kilns.

Process Weight Hourly GHG Emissions

EPN	FIN	Description	Zinc Produced Hourly (ton/hr)	CO_2[2] Emission Factor[1] (ton CO_2 / ton zinc)	CO_2 Hourly Emissions (lb/hr)
KILN-1	KILN-1	Waelz Kiln	5.12	3.66	37,469

[1] Hourly Emissions factor obtained from Table 4.24 in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Maximum Hourly Emissions Calculation

EPN	FIN	Description	Hourly Emissions[1,2]							
			NO_X (lb/hr)	CO (lb/hr)	SO_2[3] (lb/hr)	VOC (lb/hr)	CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)
KILN-1	KILN-1	Waelz Kiln	13.83	22.71	1.70	2.43	37,469	0.165	0.738	37,693

[1] Since the process only uses natural gas or fuel oil burners during startup, the emissions will originate either from the natural gas/fuel oil burners or from the process itself once the Waelz Kiln has reached steady state condition. Therefore, maximum hourly emissions are conservatively based on the higher hourly emission rate between natural gas/fuel oil combustion and process emissions.

[2] CO_2e Hourly Emissions (lb/hr) = CO_2 Max Emissions (lb/hr) x CO_2 GWP + CH_4 Max Emissions (lb/hr) x CH_4 GWP + N_2O Max Emissions (lb/hr) x N_2O GWP

Annual Emissions Calculation

EPN	FIN	Description	Annual Emissions[1,2]							
			NO_X (tpy)	CO (tpy)	SO_2[3] (tpy)	VOC (tpy)	CO_2 (tpy)	CH_4 (tpy)	N_2O (tpy)	CO_2e (tpy)
KILN-1	KILN-1	Waelz Kiln	60.58	99.47	7.44	10.63	164,113	0.72	3.23	165,094

[1] Annual Emissions (tpy) = Max Hourly Emissions x Hours of Operation (hr/yr) / 2,000 (lb/ton)

[2] CO_2e Annual Emissions (tpy) = CO_2 Annual Emissions (tpy) x CO_2 GWP + CH_4 Annual Emissions (tpy) x CH_4 GWP + N_2O Annual Emissions (tpy) x N_2O GWP

Zinc Resources | Recycling Plant
Table C-4. Diesel Emergency Generator Emissions Calculation

Criteria Pollutant Emission Factors

EPN	FIN	Description	Emission Factor[1] (lb/hp-hr)				
			NO_x[2]	CO	SO_2[3]	VOC[2]	$PM/PM_{10}/PM_{2.5}$[4]
EMGEN1	EMGEN1	Emergency Generator 1	9.22E-03	5.75E-03	1.08E-05	1.30E-03	3.29E-04

[1] Emission factors obtained from 40 CFR 89.112, Table 1 for a Tier 2 engine with a power rating greater than 560 kW.

[2] NO_x +NMHC factors are ratio'd 87.6% NO_x and 12.4% NMHC (VOC) based on the linear relationship of NO_x to NMHC from Table 1 of Subpart IIII and Table 1 of 40 CFR 89.112.

[3] SO_2 emission factor based on ultra-low sulfur diesel (ULSD), which contains 15 ppmw sulfur, and a conservative assumption that all of the sulfur is being converted to SO_2.

[4] Conservatively assumed total PM and $PM_{2.5}$ is equal to PM_{10}.

Criteria Pollutants Emissions Calculation

EPN	FIN	Description	Engine Rating (hp)	Max Annual Hours of Operation[2] (hr)	Maximum Hourly Emissions[3]					Maximum Annual Emissions[4]				
					NO_X (lb/hr)	CO (lb/hr)	SO_2 (lb/hr)	VOC (lb/hr)	$PM/PM_{10}/PM_{2.5}$ (lb/hr)	NO_X (tpy)	CO (tpy)	SO_2 (tpy)	VOC (tpy)	$PM/PM_{10}/PM_{2.5}$ (tpy)
EMGEN1	EMGEN1	Emergency Generator 1	1,006	100	9.27	5.79	0.01	1.31	0.33	0.46	0.29	5.43E-04	0.07	0.02

[1] The engine is a compression ignition engine.

[2] A maximum of 50 hours of maintenance and maximum of 50 hours of general use are allowed under MACT ZZZZ for emergency engines. Operations during emergency use are not restricted.

[3] Maximum Hourly Emissions (lb/hr) = Engine Rating (hp) x Emission Factor (lb/hp-hr)

$$\text{Example NOx Hourly Emission Rate (lb/hr)} = \frac{1{,}006 \text{ hp}}{} \times \frac{9.22\text{E-}03 \text{ lb}}{\text{hp-hr}} = 9.27 \text{ lb/hr}$$

[4] Maximum Annual Emission (tpy) = Maximum Hourly Emission Rate (lb/hr) x Hours of Operation (hr/yr) / (2,000 lb/ton)

$$\text{Example NOx Annual Emission Rate (tpy)} = \frac{9.27 \text{ lb}}{\text{hr}} \times \frac{100 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lb}} = 0.46 \text{ tpy}$$

Greenhouse Gas Emission Factors

EPN	Fuel	Default Higher Heating Value (HHV)[1] (MMBtu/gal)	Emission Factors[2] (kg/MMBtu)			Global Warming Potentials (GWPs)[3]		
			CO_2	CH_4	N_2O	CO_2	CH_4	N_2O
EMGEN1	Distillate Fuel Oil No. 2	0.138	73.96	0.0030	0.0006	1	25	298

[1] HHV (MMBtu/scf) is taken from the GHG MRR under "Table C-1 of Subpart C of Part 98 - Default CO_2 Emission Factors and High Heat values for Various Types of Fuel."

[2] Emission Factors is taken from the GHG MRR under "Table C-1 of Subpart C and Table C-2 of Subpart C." Default CH_4 and N_2O emission factors are based on Petroleum, per listings in Table C-2.

[3] EPA GHG MRR rule (40 CFR 98, dated September 22, 2009), Table A-1. Updated GWP finalized on November 29, 2013.

Greenhouse Gas Emission Calculations

EPN	FIN	Description	Fuel Usage[1] (gal/hr)	Hours of Operation (hr/yr)	Maximum Hourly Emissions[2,4]				Maximum Annual Emissions[3,4]			
					CO_2 (lb/hr)	CH_4 (lb/hr)	N_2O (lb/hr)	CO_2e (lb/hr)	CO_2 (tpy)	CH_4 (tpy)	N_2O (tpy)	CO_2e (tpy)
EMGEN1	EMGEN1	Emergency Generator 1	51.02	100	1,148	0.05	9.31E-03	1,152	57.40	2.33E-03	4.66E-04	57.59

[1] Fuel usage is calculated using average brake-specific fuel consumption provided in AP-42 Section 3.3 Table 3.3-1.

[2] Maximum Hourly Emissions (lb/hr) = Engine Fuel Usage (gal/hr) x Default HHV (MMBtu/gal) x Emission Factor (kg/MMBtu) x Conversion Factor (lb/kg)

$$CO_2 \text{ Hourly Emission Rate (lb/hr)} = \frac{51 \text{ gal}}{} \times \frac{0.138 \text{ MMBtu}}{\text{gal}} \times \frac{73.96 \text{ kg}}{\text{MMBtu}} \times \frac{2.2046 \text{ lb}}{\text{kg}} = 1{,}147.96 \text{ lb/hr}$$

[3] Maximum Annual Emission (tpy) = Maximum Hourly Emission Rate (lb/hr) x Hours of Operation (hr/yr) / (2,000 lb/ton)

$$CO_2 \text{ Annual Emission Rate (tpy)} = \frac{1{,}147.96 \text{ lb}}{\text{hr}} \times \frac{100 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lb}} = 57.40 \text{ tpy}$$

[4] CO_2e emissions are calculated based on the Global Warming Potentials (GWP)

$CO_2e = CO_2$ Emission Rate * CO_2 GWP + CH_4 Emission Rate * CH_4 GWP + N_2O Emission Rate * N_2O GWP

Zinc Resources | Recycling Plant
Table C-4. Diesel Emergency Generator Emissions Calculation

HAP Combustion Emission Calculations

Constituent	CAS No.	Emission Factors for Large Engines[1] (lb/MMBtu)	Adjusted Emission Factors[2] (lb/MMBtu)	EMGEN1[3] (lb/hr)	(tpy)
Benzene	71-43-2	7.76E-04	8.49E-02	0.60	0.03
Toluene	108-88-3	2.81E-04	3.07E-02	0.22	0.01
Xylene	1330-20-7	1.93E-04	2.11E-02	0.15	7.43E-03
Formaldehyde	50-00-0	7.89E-05	8.63E-03	0.06	3.04E-03
Acetaldehyde	75-07-0	2.52E-05	2.76E-03	0.02	9.70E-04
Acrolein	107-02-8	7.88E-06	8.62E-04	6.07E-03	3.03E-04
Naphthalene	91-20-3	1.30E-04	1.42E-02	0.10	5.01E-03
PAHs	-	2.12E-04	2.32E-02	0.16	8.16E-03

[1] Emission Factors for large engines (greater than 600 hp) are from AP-42, Section 3.4, Table 3.4-3 (October 1996).
Some speciated constituents are not identified as HAP within this AP-42 Section; however, these constituents have been identified as HAP in other AP-42 Sections, such as AP-42, Section 3.2.
Polycyclic Aromatic Compounds (PAHs) with two or more aromatic rings are grouped (except for naphathalene) and represented as PAHs.

[2] The sum of HAP emission factors obtained from AP-42 emission factors is greater than VOC emission factor from 40 CFR 89.112, Table 1 for a Tier 2 engine.
The AP-42 HAP emission factors are adjusted assuming all VOC emissions are HAP emissions at the same ratio.
Sample calculation for Benzene Adjusted Emission Factor for Large Emergency Engine:

$$\text{Benzene Adjusted Emission Factor for Emergency Engine (lb/MMBtu)} = \frac{1.30\text{E-}03 \text{ lb}}{\text{hp-hr}} \times \frac{\text{hp-hr}}{7000 \text{ Btu}} \times \frac{1{,}000{,}000 \text{ Btu}}{1 \text{ MMBtu}} \times \frac{\text{MMBtu}}{1.70\text{E-}03 \text{ lb tota}} \times \frac{7.76\text{E-}04 \text{ lb}}{\text{MMBtu}} = 8.49\text{E-}02 \text{ lb/MMBtu}$$

[3] Sample calculations of benzene emissions for EMGEN1:

$$\text{Benzene Hourly Emission Rate (lb/hr)} = \frac{51 \text{ gal}}{\text{hr}} \times \frac{0.138 \text{ MMBtu}}{\text{gal}} \times \frac{8.49\text{E-}02 \text{ lb}}{\text{MMBtu}} = 0.60 \text{ lb/hr}$$

$$\text{Benzene Annual Emission Rate (tpy)} = \frac{0.60 \text{ lb}}{\text{hr}} \times \frac{100 \text{ hr}}{\text{yr}} \times \frac{1 \text{ ton}}{2{,}000 \text{ lb}} = 2.99\text{E-}02 \text{ tpy}$$

Zinc Resources | Recycling Plant
Table C-5. Diesel Storage Tank Emissions Calculation

Diesel Tank Physical Properties

EPN	FIN	Description	Product Stored	Capacity (gal)	Diameter (ft)	Length (ft)	Maximum Hourly Throughput[1] (gal/hr)	Maximum Monthly Throughput[2] (gal/month)	Annual Throughput[3] (gal/yr)
T1	T1	Diesel Tank	Diesel	20,000	10	36	7,042	218,310	2,570,423

[1] Maximum hourly throughput conservatively based on the assumption that the diesel tank can be filled within an hour.

[2] The maximum monthly throughput of each diesel tank is conservatively based on an hourly throughput of 3,000 gal/hr and 31 days a month.

[3] The annual throughput of the diesel tank is conservatively based on the tank being filled once every day of the year.

Working and Breathing Emissions Calculation

EPN	FIN	Description	Product Stored	Maximum Daily Liquid Surface Temperature[1] (°R)	Vapor Pressure at Maximum Liquid Surface Temperature (P_{VA})[2] (psia)	Vapor Molecular Weight (M_V)[3] (lb/lb-mol)	Hourly VOC Emissions[4] (lb/hr)	Annual VOC Emissions[5] (tpy)
T1	T1	Diesel Tank	Diesel	554.67	0.019	130	0.38	0.02

[1] Maximum daily liquid surface temperature is conservatively assumed to be 95°F.

[2] Vapor pressure at maximum liquid surface temperature is calculated based on antoine's coefficients.

[3] Molecular weight of diesel were obtained from AP-42 Chapter 7.1 (June 2020), Table 7.1-2 for distillate Fuel Oil No. 2.

[4] Hourly emissions are calculated based on *TCEQ Air Permit Division Estimating Short Term Emission Rates from Fixed Roof Tanks* (APDG 6250v3, revised 02/20).

$$L_{MAX} = \frac{M_V P_{VA}}{RT} FR_M$$

Where

L_{MAX}= Maximum short term emission rate, lbs/hour

M_v= vapor molecular weight, lb/lb-mole

P_{VA}= VP at max daily liquid surface temperature, psia

FR_M= Maximum filling rate, gal/hr

R= Ideal gas constant, (psia gal)/(lb-mol °R)

T= Max daily liquid surface temperature, °R

$$\text{Maximum Hourly Emissions} = \frac{7{,}042 \text{ gal}}{\text{hr}} \left| \frac{130 \text{ lb}}{\text{lb-mol}} \right| \frac{0.019 \text{ psia}}{554.67 \text{ °R}} \left| \frac{\text{°R lb-mol}}{80.273 \text{ psia gal}} \right. = 0.38 \text{ lb/hr}$$

[5] Annual emissions are based on AP-42 Section 7.1.3.1 (June, 2020). See separate pages.

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Table C-6. Diesel Storage Tank Annual Emissions Calculation

Calculation performed in accordance with AP-42, June 2020, Section 7.1.3.1.

Variable	
Tank Identification	*T1*
CIN	*N/A*
Discharging to	*Atmosphere*
EPN	*T1*
Location for Calculation Purposes	**Corpus Christi, TX**
Tank/Roof Type	**Horizontal Tank**
Underground?	**Aboveground**
Diameter, ft	**10.0**
Shell Height or Length, ft	**36.0**
Working Capacity, gal	*20,000*
Breather Vent Type	*Combination Vent Valve*
Shell Paint Color	**White**
Shell Paint Condition	**New**
Shell Insulated?	**No**
Roof Paint Color	**White**
Roof Paint Condition	**New**
Roof Insulated?	**No**
Measured Liquid Bulk Temperature, F	**Unknown**
Measured Maximum Liquid Bulk Temperature, F	**Unknown**
Measured Minimum Liquid Bulk Temperature, F	**Unknown**

	January	February	March	April	May	June	July	August	September	October	November	December
Type of Substance	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**	**Organic Liquid**
Contents of Tank	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**	**Diesel**
Throughput, gallons/month	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**	**218,310**
Effective Diameter, ft	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
Effective Height, ft	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Working Capacity, gal	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000	20,000
Maximum Liquid Height, ft	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9	7.9
Minimum Liquid Height, ft	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Average Liquid Height, ft	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93
Cone Tank Roof Slope, ft/ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dome Tank Roof Radius, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Dome Tank Roof Height, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Roof Outage, ft	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Vapor Space Outage, ft	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93	3.93
Vapor Space Volume, ft^3	1414	1414	1414	1414	1414	1414	1414	1414	1414	1414	1414	1414
Average Daily Minimum Ambient Temperature, °R	508.07	511.57	516.97	523.57	530.27	534.17	534.97	535.17	532.17	524.97	515.87	509.27
Average Daily Maximum Ambient Temperature, °R	526.57	530.27	535.17	540.77	545.87	550.07	552.07	553.47	548.97	543.37	534.77	528.17
Average Daily Ambient Temperature Range, °R	18.50	18.70	18.20	17.20	15.60	15.90	17.10	18.30	16.80	18.40	18.90	18.90
Daily Total Solar Insolation Factor, Btu/ft^2/day	891	1113	1385	1636	1850	2072	2110	1975	1662	1397	1040	838
Daily Average Ambient Temperature, °R	517.3	520.9	526.1	532.2	538.1	542.1	543.5	544.3	540.6	534.2	525.3	518.7
Tank Roof Paint Solar Absorbance, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Tank Shell Paint Solar Absorbance, dimensionless	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170	0.170
Average Daily Vapor Temperature Range, °R	15.9	16.8	17.3	17.4	17.0	17.9	18.9	19.3	17.2	17.5	16.7	16.0
Average Daily Liquid Surf. Temperature, °R	518.3	522.2	527.6	534.0	540.2	544.5	545.9	546.6	542.5	535.8	526.5	519.7
Average Daily Minimum Liquid Surf. Temperature, °R	514.4	518.0	523.3	529.7	535.9	540.0	541.2	541.7	538.2	531.4	522.3	515.7
Average Daily Maximum Liquid Surf. Temperature, °R	522.3	526.4	532.0	538.4	544.4	549.0	550.6	551.4	546.8	540.1	530.7	523.7
Liquid Bulk Temperature, °R	517.8	521.5	526.8	533.0	539.0	543.2	544.6	545.3	541.4	534.9	525.9	519.1
Average Vapor Temperature, °R	518.9	522.9	528.5	535.1	541.3	545.8	547.3	547.8	543.5	536.6	527.2	520.2
Vapor Molecular Weight, lb/lbmol	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00	130.00
Antoine's Coefficient A	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80	3.80

Zinc Resources | Recycling Plant
Table C-6. Diesel Storage Tank Annual Emissions Calculation

Calculation performed in accordance with AP-42, June 2020, Section 7.1.3.1.

Variable	
Tank Identification	*T1*
CIN	*N/A*
Discharging to	*Atmosphere*
EPN	*T1*
Location for Calculation Purposes	**Corpus Christi, TX**
Tank/Roof Type	**Horizontal Tank**
Underground?	**Aboveground**
Diameter, ft	**10.0**
Shell Height or Length, ft	**36.0**
Working Capacity, gal	*20,000*
Breather Vent Type	*Combination Vent Valve*
Shell Paint Color	**White**
Shell Paint Condition	**New**
Shell Insulated?	**No**
Roof Paint Color	**White**
Roof Paint Condition	**New**
Roof Insulated?	**No**
Measured Liquid Bulk Temperature, F	**Unknown**
Measured Maximum Liquid Bulk Temperature, F	**Unknown**
Measured Minimum Liquid Bulk Temperature, F	**Unknown**

	January	February	March	April	May	June	July	August	September	October	November	December
Antoine's Coefficient B	686.26	686.26	686.26	686.26	686.26	686.26	686.26	686.26	686.26	686.26	686.26	686.26
Antoine's Coefficient C	144.92	144.92	144.92	144.92	144.92	144.92	144.92	144.92	144.92	144.92	144.92	144.92
Type of Substance (for use in calculations)	Org	Org	Org	Org	Org	Org	Org	Org	Org	Org	Org	Org
Vapor Pressure at Daily Av. Liquid Surf. Temp., psia	0.0062	0.0070	0.0084	0.0103	0.0124	0.0140	0.0146	0.0149	0.0132	0.0108	0.0081	0.0064
Vapor Pressure at Daily Min. Liquid Surf. Temp., psia	0.0054	0.0061	0.0073	0.0090	0.0109	0.0123	0.0128	0.0130	0.0117	0.0095	0.0070	0.0056
Vapor Pressure at Daily Max. Liquid Surf. Temp., psia	0.0070	0.0081	0.0096	0.0117	0.0140	0.0160	0.0167	0.0171	0.0150	0.0124	0.0092	0.0074
Vapor Density, lb/ft^3	0.00014	0.00016	0.00019	0.00023	0.00028	0.00031	0.00032	0.00033	0.00030	0.00024	0.00019	0.00015
Daily Vapor Pressure range, psi	0.0017	0.0020	0.0023	0.0028	0.0031	0.0036	0.0040	0.0041	0.0033	0.0029	0.0022	0.0018
Breather Vent Pressure Setting, psig	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300	0.0300
Breather Vent Vacuum Setting, psig	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300	-0.0300
Breather Vent Pressure Setting Range, psi	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600	0.0600
Ambient Pressure, psia	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
Vapor Space Expansion Factor	0.029	0.0302	0.0311	0.0313	0.0306	0.0322	0.0340	0.0347	0.0310	0.0315	0.0300	0.0288
Vented Vapor Saturation Factor	0.999	0.999	0.998	0.998	0.997	0.997	0.997	0.997	0.997	0.998	0.998	0.999
Sum of Increases in Liquid Level, ft	81.058	81.058	81.058	81.058	81.058	81.058	81.058	81.058	81.058	81.058	81.058	81.058
Annual Turnovers	123.85	123.85	123.85	123.85	123.85	123.85	123.85	123.85	123.85	123.85	123.85	123.85
Turnover Factor	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Working Loss Product Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Net Working Loss Throughput, ft^3	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75	29180.75
Vent Setting Correction Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Standing Storage Loss, lb/mo	0.1802	0.1940	0.2622	0.3085	0.3700	0.4248	0.4809	0.5000	0.3867	0.3365	0.2363	0.1895

Zinc Resources | Recycling Plant
Table C-6. Diesel Storage Tank Annual Emissions Calculation

Calculation performed in accordance with AP-42, June 2020, Section 7.1.3.1.

Variable	
Tank Identification	*T1*
CIN	*N/A*
Discharging to	*Atmosphere*
EPN	*T1*
Location for Calculation Purposes	**Corpus Christi, TX**
Tank/Roof Type	**Horizontal Tank**
Underground?	**Aboveground**
Diameter, ft	**10.0**
Shell Height or Length, ft	**36.0**
Working Capacity, gal	*20,000*
Breather Vent Type	*Combination Vent Valve*
Shell Paint Color	**White**
Shell Paint Condition	**New**
Shell Insulated?	**No**
Roof Paint Color	**White**
Roof Paint Condition	**New**
Roof Insulated?	**No**
Measured Liquid Bulk Temperature, F	**Unknown**
Measured Maximum Liquid Bulk Temperature, F	**Unknown**
Measured Minimum Liquid Bulk Temperature, F	**Unknown**

	January	February	March	April	May	June	July	August	September	October	November	December
Working Loss, lb/mo	1.7146	1.9393	2.2960	2.7751	3.3046	3.7183	3.8656	3.9336	3.5210	2.9180	2.2182	1.7906
Total Losses, lb/mo	1.8948	2.1333	2.5582	3.0836	3.6746	4.1431	4.3465	4.4336	3.9078	3.2545	2.4546	1.9801

Standing Storage Loss, lb/yr	3.8695
Working Loss, lb/yr	33.9950
Total Losses, lb/yr	37.8646

Sample Calculations

Emissions were calculated on a pounds per month basis. The emissions for each month were then summed in order to estimate annual emissions. Monthly emissions were calculated according to the calculation methodology for fixed roof tanks explained in EPA AP-42 Chapter 7 (June 2020) for Organic Liquid Storage Tanks.

A sample calculation has been provided for the tank, material, and month which had the highest emissions. All Input data and intermediate calculation information has been provided.

Estimating Monthly Emissions from Fixed Roof Tanks

[LT] = [LS] + [LW]

[LS] = [MD] x [VV] x [WV] x [KE] x [KS]

[LW] = [VQ] x [KN] x [KP] x [WV] x [KB]

Where:

LT	Total Losses, lb/mo
LS	Standing Storage Loss, lb/mo
LW	Working Loss, lb/mo
MD	Days in month
VV	Vapor Space Volume, ft^3
WV	Vapor Density, lb/ft^3
KE	Vapor Space Expansion Factor

Where:

KS	Vented Vapor Saturation Factor
KB	Vent Setting Correction Factor
WV	Vapor Density, lb/ft^3
VQ	Net Working Loss Throughput, ft3
KN	Turnover Factor
KP	Working Loss Product Factor

Maximum Monthly Emissions:

Material	Diesel
Month	July

Values for Sample Calculation

LT	4.3465	KS	0.9970
LS	0.4809	KB	1
LW	3.8656	WV	0.0003
MD	31	VQ	29,181
VV	1413.7167	KN	0.4089
WV	0.0003	KP	1
KE	0.0340		

[LT] = [0.4809] + [3.8656] = 4.3465 lbs

[LS] = [31] x [1413.7167] x [0.0003] x [0.0340] x [0.9970] = 0.4809 lbs

[LW] = [29180.75] x [0.4089] x [1.00] x [1.0000] x [0.0003] = 3.8656 lb

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Table C-7. Fugitive Dust from Bulk Material Transfer Emissions Calculation

EPN	FIN	Description of Operation	Material	Throughput		Control Efficiency[1]	Moisture Content[2] (%)	Emission Factor[3]			Total Emissions					
				Hourly (ton/hr)	Annual (tpy)			PM (lb/ton)	PM_{10} (lb/ton)	$PM_{2.5}$ (lb/ton)	PM (lb/hr)	PM (tpy)	PM_{10} (lb/hr)	PM_{10} (tpy)	$PM_{2.5}$ (lb/hr)	$PM_{2.5}$ (tpy)
WIPB	WIP1	Kiln Drop to Conveyor	WIP	14	87,083	0.90	0.20%	0.09	0.04	6.48E-03	0.12	0.39	0.06	0.19	0.01	0.03
WIPB	WIP2	Conveyor to Building	WIP	14	87,083	0.90	0.20%	0.09	0.04	6.48E-03	0.12	0.39	0.06	0.19	0.01	0.03
WIPB	WIP3	WIP Building to Truck	WIP	14	87,083	0.90	0.20%	0.09	0.04	6.48E-03	0.12	0.39	0.06	0.19	0.01	0.03

[1] Based on Table 7 of TCEQ Draft RG 058 Rock Crushing Plants, February 2002.

[2] Assumed. AP-42 Table 13.2.4-1 provides a conservative value of 0.2% as the lowest moisture content for iron production.

[3] Emission factors based on Equation 1 of AP-42 Section 13.2.4.

APPENDIX D. TCEQ EQUIPMENT FORMS

Texas Commission on Environmental Quality
Table 11 Instructions

A. Emission Point Number (EPN) and Emission Point Name:

- Identify the EPN and name for the location that air contaminants enter the atmosphere. The EPNs must be consistent with the emission point identification used on the plot plan, any previous permits, and the "Emissions Inventory Questionnaire."

B. Manufacturer and Model Number:

- Enter the company brand name and model number. Include manufacturer's specifications or brochure, if available.

C. Name of Source(s) or Equipment Being Controlled:

- Enter the name of the source(s) or equipment being controlled. Associate the EPN to the appropriate facility(ies) with facility identification number(s) (FIN), or a description of the process or equipment being controlled. If using FINs, these numbers can be alphanumeric and maximum of 10 characters. Please note that no two distinct facilities may share the same FIN. The FINs must match those on your permit.

D. Type of Particulate Controlled:

- List each component or air contaminant name. Examples of component names are; lead, sand, clay, iron dust, and cement dust.

E. Gas Stream Characteristics

- Include the design maximum flow rate in units of actual cubic feet per minute (acfm), the average flow rate expected in acfm;
- Enter the temperature of the exhaust gas stream from the baghouse;
- Enter the amount of particulate matter in the inlet and outlet gas stream. The inlet and outlet particulate grain loading in grains per dry standard cubic foot (scf).
- Enter the pressure drop across the baghouse measured in inches of water column.
- Enter the water vapor content of the exhaust stream measured in pounds of water per pound of dry air.
- Enter the fan motor requirements in horsepower and the fan capacity in acfm.

F. Particulate Distribution (By Weight)

- Enter the particle size distribution as determined through laboratory analysis in units of microns (micrometers).

G. Filter Characteristics

- Filtering velocity in units of acfm of air stream flow divided by the total surface area of the filtering media in square feet (ft^2). The filtering velocity can also be expressed in units of feet per minute (fpm).
- Enter the bag diameter expressed in units of inches.
- Enter the length of the filter bags in units of feet.
- Enter the quantity of bags used in the filtering of the air stream.

H. Bag Rows

- Enter the pattern or arrangement of the baghouse bag filter rows. Indicate the arrangement of the baghouse bag filter rows. Select staggered or straight.

I. Walkways

- Enter “YES” if there will be space available between the rows of bag filters to provide access for inspection and maintenance. Otherwise, enter “NO.”

J. Material

- Identify the filtering media and include any additional coating or treatment of the baghouse material.

K. Cleaning

- Explain the method of bag filter cleaning. Typically, there are mechanical shakers or reverse pulse air jets.

L. Cost

- Identify the capital cost of installation of the baghouse. This includes all engineering design costs and construction costs associated with the establishment of the control device.
- Estimate the annual operating expenses for the baghouse, including utility expense and replacement bag costs.

  Note: The Texas Commission on Environmental Quality standard conditions are 68^{o} F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1).

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BVF-1	Emission Point Name: Bin Vent Filter 1
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
WZO #1 Silo	BVF-1	BVF-1

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
2000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	Staggered Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	☐ ☐
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Reset Form Print Form

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BVF-2	Emission Point Name: Bin Vent Filter 2
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
WZO #2 Silo	BVF-2	BVF-2

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
2000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	Staggered Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	☐ ☐
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Reset Form Print Form

Texas Commission on Environmental Quality
Table 11 Instructions

A. Emission Point Number (EPN) and Emission Point Name:

- Identify the EPN and name for the location that air contaminants enter the atmosphere. The EPNs must be consistent with the emission point identification used on the plot plan, any previous permits, and the "Emissions Inventory Questionnaire."

B. Manufacturer and Model Number:

- Enter the company brand name and model number. Include manufacturer's specifications or brochure, if available.

C. Name of Source(s) or Equipment Being Controlled:

- Enter the name of the source(s) or equipment being controlled. Associate the EPN to the appropriate facility(ies) with facility identification number(s) (FIN), or a description of the process or equipment being controlled. If using FINs, these numbers can be alphanumeric and maximum of 10 characters. Please note that no two distinct facilities may share the same FIN. The FINs must match those on your permit.

D. Type of Particulate Controlled:

- List each component or air contaminant name. Examples of component names are; lead, sand, clay, iron dust, and cement dust.

E. Gas Stream Characteristics

- Include the design maximum flow rate in units of actual cubic feet per minute (acfm), the average flow rate expected in acfm;
- Enter the temperature of the exhaust gas stream from the baghouse;
- Enter the amount of particulate matter in the inlet and outlet gas stream. The inlet and outlet particulate grain loading in grains per dry standard cubic foot (scf).
- Enter the pressure drop across the baghouse measured in inches of water column.
- Enter the water vapor content of the exhaust stream measured in pounds of water per pound of dry air.
- Enter the fan motor requirements in horsepower and the fan capacity in acfm.

F. Particulate Distribution (By Weight)

- Enter the particle size distribution as determined through laboratory analysis in units of microns (micrometers).

G. Filter Characteristics

- Filtering velocity in units of acfm of air stream flow divided by the total surface area of the filtering media in square feet (ft^2). The filtering velocity can also be expressed in units of feet per minute (fpm).
- Enter the bag diameter expressed in units of inches.
- Enter the length of the filter bags in units of feet.
- Enter the quantity of bags used in the filtering of the air stream.

H. Bag Rows

- Enter the pattern or arrangement of the baghouse bag filter rows. Indicate the arrangement of the baghouse bag filter rows. Select staggered or straight.

I. Walkways

- Enter “YES” if there will be space available between the rows of bag filters to provide access for inspection and maintenance. Otherwise, enter “NO.”

J. Material

- Identify the filtering media and include any additional coating or treatment of the baghouse material.

K. Cleaning

- Explain the method of bag filter cleaning. Typically, there are mechanical shakers or reverse pulse air jets.

L. Cost

- Identify the capital cost of installation of the baghouse. This includes all engineering design costs and construction costs associated with the establishment of the control device.
- Estimate the annual operating expenses for the baghouse, including utility expense and replacement bag costs.

  Note: The Texas Commission on Environmental Quality standard conditions are 68^o F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1).

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BH-1	Emission Point Name: Building Baghouse
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
Conditioning, Blending and Pelletizing Building Emissions	BH-1	BH-1

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
57,000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

Texas Commission on Environmental Quality
Table 11
Fabric Filters

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	☐ Staggered ☐ Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BH-2	Emission Point Name: Building Baghouse
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
Conditioning, Blending and Pelletizing Building Emissions	BH-2	BH-2

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
57,000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

Texas Commission on Environmental Quality
Table 11
Fabric Filters

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	☐ Staggered ☐ Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BH-3	Emission Point Name: Building Baghouse
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
Conditioning, Blending and Pelletizing Building Emissions	BH-3	BH-3

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
18,000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

Texas Commission on Environmental Quality
Table 11
Fabric Filters

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	☐ Staggered ☐ Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: BH-4	Emission Point Name: Building Baghouse
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
Conditioning, Blending and Pelletizing Building Emissions	BH-1	BH-1

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
18,000 dscfm		Ambient	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

Texas Commission on Environmental Quality
Table 11
Fabric Filters

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	☐ Staggered ☐ Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	
Type of bag: Felted Polypropylene	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Reset Form Print Form

Texas Commission on Environmental Quality
Table 7(b)
Horizontal Fixed Roof Storage Tank Summary

I. Tank Identification ***(Use a separate form for each tank)***			
Applicant's Full Name: Zinc Resources LLC			
Location *(indicate on plot plan and provide coordinates):*			
Tank No.: B8250		Emission Point No. (EPN) *(from flow diagram)*: T1	
FIN: T1		CIN:	
Status: ☒ New Tank	☐ Altered Tank	☐ Relocation	☐ Change of Service
Previous Permit No., Permit by Rule No., or Exemption No.:			
II. Tank Physical Characteristics			
Dimensions			
Shell Length *(ft.)*: 36		Diameter *(ft.): 10*	
Nominal Capacity or Working Volume *(gallons)*: 20,000		Turnovers per year:	
Net Throughput *(gallons/year)*: 2,570,423		Maximum Filling Rate *(gallons/hour)*: 7,042	
Is the tank underground?			☐ YES ☒NO
Paint Characteristics			
Shell Color/Shade: ☒ White/White	☐ Aluminum/Specular	☐ Aluminum/Diffuse	
☐ Gray/Light	☐ Gray/Medium	☐ Red/Primer	
☐ Other:_____			
Shell Condition: ☒ Good	☐ Poor		
Breather Vent Settings			
Combination Vent Valve Number:			
Combination Vent Valve Pressure Setting *(psig)*: 0.03			
Combination Vent Valve Vacuum Setting *(psig)*: 0.03			
SPECIFY "Atmosphere" or "Discharging" to *(name of abatement device)*:			
Pressure Vent Valve Number:			
Pressure Vent Valve Pressure Setting *(psig)*:			
SPECIFY "Atmosphere" or "Discharging" to *(name of abatement device)*:			
Vacuum Vent Valve Number:			
Vacuum Vent Valve Pressure Setting *(psig)*:			

Texas Commission on Environmental Quality
Table 7(b)
Horizontal Fixed Roof Storage Tank Summary

II. Tank Physical Characteristics *(continued)*			
Breather Vent Settings *(continued)*			
Open Vent Valve Number:			
SPECIFY "Atmosphere" or "Discharging" to *(name of abatement device)*:			
III. Liquid Properties of Stored Material			
Chemical Category: ☐ Organic Liquid	☒ Petroleum Distillates	☐ Crude Oils	
☐ Single *(Complete Section III.1.)*	☐ Multi-Component Liquid *(Complete Section III.2.)*		
1. Single Component Information			
Chemical Name: No. 2 Fuel Oil (Diesel)			
CAS Number: 68476-34-6			
Average Liquid Surface Temperature *(˚F)*: 74			
True Vapor Pressure at Average Liquid Surface Temperature *(psia)*: 0.015			
Liquid Molecular Weight: 188 lb/lb mole			
2. Multiple Component Information			
Mixture Name:			
Average Liquid Surface Temperature *(˚F)*:			
Minimum Liquid Surface Temperature (*˚F*)*:*			
Maximum Liquid Surface Temperature *(˚F)*:			
True Vapor Pressure at Average Liquid Surface Temperature *(psia)*:			
True Vapor Pressure at Minimum Liquid Surface Temperature *(psia)*:			
True Vapor Pressure at Maximum Liquid Surface Temperature *(psia)*:			
Liquid Molecular Weight:			
Vapor Molecular Weight:			

Chemical Components Information

Chemical Name	CAS No.	Percent of Total Liquid Weight *(typical)*	Percent of Total Vapor Weight *(typical)*	Molecular Weight

Texas Commission on Environmental Quality
Table 29 Reciprocating Engines

I. Engine Data			
Manufacturer:	Model No.	Serial No.	Manufacture Date:
Rebuilds Date:	No. of Cylinders:	Compression Ratio:	EPN: EMGEN1

Application: ☐ Gas Compression ☐ Electric Generation ☐ Refrigeration ☒ Emergency/Stand by

☐ 4 Stroke Cycle ☐ 2 Stroke Cycle ☐ Carbureted ☐ Spark Ignited ☐ Dual Fuel ☐ Fuel Injected

☒ Diesel ☐ Naturally Aspirated ☐ Blower /Pump Scavenged ☐ Turbo Charged and I.C. ☐ Turbo Charged

☐ Intercooled ☐ I.C. Water Temperature ☐ Lean Burn ☐ Rich Burn

Ignition/Injection Timing: Fixed: Variable:

Manufacture Horsepower Rating: 750 KW | Proposed Horsepower Rating:

Discharge Parameters

Stack Height (Feet)	Stack Diameter (Feet)	Stack Temperature (°F)	Exit Velocity (FPS)
10	0.15	809.26	164

II. Fuel Data

Type of Fuel: ☐ Field Gas ☐ Landfill Gas ☐ LP Gas ☐ Natural Gas ☐ Digester Gas ☒ Diesel

Fuel Consumption (BTU/bhp-hr): 7000 | Heating Value: 0.138 MMBTU/g | Lower Heating Value:

Sulfur Content (grains/100 scf - weight %): 15 ppm

III. Emission Factors (Before Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM_{10}	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv
4.18		2.61		4.90E-03		0.59				0.15	

Source of Emission Factors: ☐ Manufacturer Data ☒ AP-42 ☒ Other (specify): 40 CFR 89.112

IV. Emission Factors (Post Control)

NO_X		CO		SO_2		VOC		Formaldehyde		PM_{10}	
g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv	g/hp-hr	ppmv

Method of Emission Control: ☐ NSCR Catalyst ☐ Lean Operation ☐ Parameter Adjustment

☐ Stratified Charge ☐ JLCC Catalyst ☐ Other (Specify): _____

Note: *Must submit a copy of any manufacturer control information that demonstrates control efficiency.*

Is Formaldehyde included in the VOCs? ☒ Yes ☐ No

V. Federal and State Standards (Check all that apply)

☐ NSPS JJJJ ☒ MACT ZZZZ ☒ NSPS IIII ☐ Title 30 Chapter 117 - List County: _____

VI. Additional Information

1. Submit a copy of the engine manufacturer's site rating or general rating specification data.
2. Submit a typical fuel gas analysis, including sulfur content and heating value. For gaseous fuels, provide mole percent of constituents.
3. Submit description of air/fuel ratio control system (manufacturer information is acceptable).

Reset Form Print Form

Texas Commission on Environmental Quality
Table 11 Instructions

A. Emission Point Number (EPN) and Emission Point Name:

- Identify the EPN and name for the location that air contaminants enter the atmosphere. The EPNs must be consistent with the emission point identification used on the plot plan, any previous permits, and the "Emissions Inventory Questionnaire."

B. Manufacturer and Model Number:

- Enter the company brand name and model number. Include manufacturer's specifications or brochure, if available.

C. Name of Source(s) or Equipment Being Controlled:

- Enter the name of the source(s) or equipment being controlled. Associate the EPN to the appropriate facility(ies) with facility identification number(s) (FIN), or a description of the process or equipment being controlled. If using FINs, these numbers can be alphanumeric and maximum of 10 characters. Please note that no two distinct facilities may share the same FIN. The FINs must match those on your permit.

D. Type of Particulate Controlled:

- List each component or air contaminant name. Examples of component names are; lead, sand, clay, iron dust, and cement dust.

E. Gas Stream Characteristics

- Include the design maximum flow rate in units of actual cubic feet per minute (acfm), the average flow rate expected in acfm;
- Enter the temperature of the exhaust gas stream from the baghouse;
- Enter the amount of particulate matter in the inlet and outlet gas stream. The inlet and outlet particulate grain loading in grains per dry standard cubic foot (scf).
- Enter the pressure drop across the baghouse measured in inches of water column.
- Enter the water vapor content of the exhaust stream measured in pounds of water per pound of dry air.
- Enter the fan motor requirements in horsepower and the fan capacity in acfm.

F. Particulate Distribution (By Weight)

- Enter the particle size distribution as determined through laboratory analysis in units of microns (micrometers).

G. Filter Characteristics

- Filtering velocity in units of acfm of air stream flow divided by the total surface area of the filtering media in square feet (ft^2). The filtering velocity can also be expressed in units of feet per minute (fpm).
- Enter the bag diameter expressed in units of inches.
- Enter the length of the filter bags in units of feet.
- Enter the quantity of bags used in the filtering of the air stream.

H. Bag Rows

- Enter the pattern or arrangement of the baghouse bag filter rows. Indicate the arrangement of the baghouse bag filter rows. Select staggered or straight.

I. Walkways

- Enter “YES” if there will be space available between the rows of bag filters to provide access for inspection and maintenance. Otherwise, enter “NO.”

J. Material

- Identify the filtering media and include any additional coating or treatment of the baghouse material.

K. Cleaning

- Explain the method of bag filter cleaning. Typically, there are mechanical shakers or reverse pulse air jets.

L. Cost

- Identify the capital cost of installation of the baghouse. This includes all engineering design costs and construction costs associated with the establishment of the control device.
- Estimate the annual operating expenses for the baghouse, including utility expense and replacement bag costs.

  Note: The Texas Commission on Environmental Quality standard conditions are 68^o F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1).

Texas Commission on Environmental Quality
Table 11
Fabric Filters

Tables, checklists, and guidance documents pertaining to air quality permits are available from the Texas Commission on Environmental Quality (TCEQ) Air Permits Division (APD) website at www.tceq.texas.gov/permitting/air.

A. Emission Point Number (EPN) and Emission Point Name	
EPN: KILN-1	Emission Point Name: KILN-1
B. Manufacturer and Model Numbers (No.)	
Manufacturer No.:	Model No.:

C Name of Source(s) or Equipment Being Controlled

Name	EPN	FIN
Waelz Kiln	KILN-1	KILN-1

D. Type of Particulate Controlled

Lead (Pb)	Metal HAPs	

E. Gas Stream Characteristics

Design Maximum	Average Expected Flow Rate (acfm)	Gas Stream Temperature (°F)	Particulate Grain Loading (grain/scf)	
65,276 dscfm	114,118	Outlet: 320	Inlet:	Outlet: 0.003
Pressure Drop (inches of H_2O	**Water Vapor Content of Effluent Stream (lb water/lb dry air)**		**Fan Requirements**	
6			hp:	ft^3/min.:

F. Particulate Distribution (By Weight)

Micron Range	Inlet %	Outlet %
0.0-0.5		
0.5-1.0		
1.0-5.0		
5-10		
10-20		
over 20		

G. Filter Characteristics

Filtering Velocity (acfm/ft^2 of Cloth)	Bag Diameter (inches)	Bag Length (feet)	Total Number of Bags

Texas Commission on Environmental Quality
Table 11
Fabric Filters

H. Bag Rows	
Indicate the arrangement of the baghouse bag filter rows.	☐ Staggered ☐ Straight
I. Walkways	
Will walkways be provided between banks of bags?	☐ YES ☐ NO
J. Filtering Material	
Identify the filtering media:	
Bag Material: P-84 coated with PTFE	
Any additional coating or treatment of the baghouse material:	
K. Cleaning of the Filter(s)	
Describe Bag Cleaning Method and Cycle:	
L. Cost	
Capital Installed Cost:	
Annual Operating Cost:	

Note: Attach the details regarding the principle of operation and an assembly drawing (front and top view) of the abatement device drawn to scale clearly showing the design, size and shape.
If the device has bypasses, safety valves, etc., include in the drawing and specify when such bypasses are to be used and under what conditions.

Reset Form Print Form

Texas Commission on Environmental Quality
Table 21:
Furnace Data Sheet

Please Complete the Following:		
Number from Flow Diagram: Waelz Kiln/D2000	Furnace Manufacturing:	
Model Number:	Size (Dimensions):	
Furnace Type: ☐ Annealing or HT ☐ Arc ☐ Blast ☐ Channel ☐ Coreless ☐ Crucible ☐ Cupola ☐ Electric ☐ Pot ☐ Reheat ☐ Retort ☐ Reverberatory ☒ Other		
Furnace Operation:		
Metal/Material Type Melted: EAF Dust	Type Heat Additives:	
Melting Capacity (tons/hr.):	Qty. of Heat Additives:	
Holding Capacity (tons):	Pouring Temperature (°F):	
Oxygen Injection (%):	Carbon Injection (%):	
Furnace Charge Makeup:	Charging Method:	
Afterburner (MMBTU/hr.): 75	Ductile Iron Production (tons/hr.):	
Method Temperature Control:	Tuyere Air (SCFM*):	
Characteristics of Fuel Input		
Fuel Type: Natural Gas	Chemical Composition (% by Weight):	
Fuel Type: No. 2 Fuel Oil (Diesel)	Chemical Composition (% by Weight):	
Fuel Type:	Chemical Composition (% by Weight):	
Fuel Type:	Chemical Composition (% by Weight):	
Inlet Air Temperature (°F):	Gross Heating Value of Fuel (specify units):	
Total Air Supplied (SCFM*):		
Fuel Flow Rate (SCFM* or lb/hr.): Design Maximum:		Average:
Characteristics of Stack Output:		
Material Emitted: Criteria Pollutants, GHGs, Pb, HAPs	Chemical Composition and Rate of Release:	
Stack Parameters (Please Specify Units):		
Stack Diameter: 8.2 ft	Stack Height: 98.43 ft	Temperature (°F): 320 °F
Velocity: 36.02 ft/s	Moisture Percentage (%):	

*Standard Cubic Feet per Minute at Standard Conditions: 70(°F), 14.7 PSIA

Please also supply an assembly drawing with dimensions and drawn to scale in as many sections as are needed to show clearly the operation of the furnace.

APPENDIX E. ELECTRONIC MODELING EVALUATION WORKBOOK (EMEW)

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

General

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Acknowledgement:	Select from the drop down:
I acknowledge that I am submitting an authorized TCEQ Electronic Modeling Evaluation Workbook and any necessary attachments. Except for inputting the requested data, I have not changed the TCEQ Electronic Modeling Evaluation Workbook in any way, including but not limited to changing formulas, formatting, content, or protections.	I agree

Administrative Information:	
Data Type:	**Facility Information:**
Project Number (6 digits):	
Permit Number:	
Regulated Entity ID (9 digits):	
Facility Name:	EAF Dust Recyling Plant
Facility Address:	1750 FM 1432
Facility County (select one):	Victoria
Company Name:	Zinc Resources LLC
Company Contact Name:	Ron Crittendon
Company Contact Number:	832-350-6800
Company Contact Email:	Rcrittendon@zincresources.com
Modeling Company Name, as applicable:	Trinity Consultants, Inc.
Modeling Contact Name:	AJ Hansborough
Modeling Contact Number:	(386) 848-0598
Modeling Contact Email:	ahansborough@trinityconsultants.com
New/Existing Site (select one):	New Site
Modeling Date (MM/DD/YYYY):	3/16/2021
Datum Used (select one):	NAD 83
UTM Zone (select one):	14

Sheet Instructions: Indicate in the Table of Contents which sections are applicable and included for this modeling demonstration. Select "X" from the drop down if the item below is included in the workbook. Note: This workbook is only for the following air dispersion models: AERSCREEN, ISC/ISCPrime, and/or AERMOD. If SCREEN3 is used, please use the separate Electronic Modeling Evaluation Workbook (EMEW) for SCREEN3 workbook.

Table of Contents:

Section:	Sheet Title *(Click to jump to specific sheet):*	Select an X from the dropdown menu if included:
1	General	X
2	Model Options	X
3	Building Downwash	X
4	Flare Source Parameters	
5	Point Source Parameters	X
6	Area Source Parameters	
7	Volume Source Calculations	X
8	Volume Source Parameters	X
9	Point and Flare Source Emissions	X
10	Area Source Emissions	
11	Volume Source Emissions	X
12	Speciated Emissions	X
13	Intermittent Sources	X
14	Modeling Scenarios	
15	Monitor Calculations	X
16	Background Justification	X
17	Secondary Formation of PM2.5	X
18	NAAQS/State Property Line (SPL) Modeling Results	X
19	Unit Impact Multipliers	X
20	Health Effects Modeling Results	X
21	Modeling File Names	X
22	Speciated Chemicals	X

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

General

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Included Attachments Instructions: The following are attachments that must be included with any modeling analysis. If providing the plot plan and area map with the permit application, ensure there is also a copy with the EMEW. The copy can be electronic.	**Select an X from the dropdown menu if included:**
Plot Plan: Instructions: Mark all that apply in the attached plot plan. For larger properties or dense source areas, provide multiple zoomed in plot plans that are legible.	
Property/Fence Lines all visible and marked.	X
North arrow included.	X
Clearly marked scale.	X
All sources and buildings are clearly labeled.	X
Area Map:	
Instructions: Mark all that apply in the attached area map.	
Annotate schools within 3,000ft of source's nearest property line.	X
All property lines are included.	X
Non-industrial receptors are identified.	
Additional Attachments (as applicable): *Note: These are just a few examples of attachments that may need to be included. There may be others depending on the scope of the modeling analysis.*	**Select an X from the dropdown menu if included:**
Processed Met Data Information	
Excel spreadsheet of processed meteorology data.	Choose an item
Meteorological Files (all input and outputs).	Choose an item
Source Group Descriptions	
Description of modeling source groups (could be in a tabulated format).	Choose an item
Modeling Techniques and Scenarios *Provide all justification and discussion on modeling scenarios used for the modeling analyses. The following boxes are examples of approaches that should be provided but is not all inclusive.*	
Discussion on modeling techniques not discussed in workbook.	Choose an item
Justification for exceedance refinements, as applicable.	Choose an item
Discussion and images for worst-case determination, as applicable.	Choose an item
Single Property Line Designation, as applicable	
Include Agreement, Order, and map defining each petitioner.	Choose an item
Post Processing using Unit Impact Multipliers (UIMs)	
Include documentation on any calculations used with the UIMs (i.e., Step 3 of the MERA).	Choose an item
Tier 3 NO_2 analysis *If OLM or PVMRM are used, provide all justification and documentation on using this approach.*	
Description of model setup.	Choose an item
Description and justification of model options selected (i.e., NO_2 to NO_x in-stack ratios).	Choose an item
Other Attachments *Provide a list in the box below of additional attachments being provided that are not listed above:*	
	Choose an item

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

I. Project Information
A. Project Overview: In the box below, give a brief Project Overview. To type or insert text in box, double click in the box below. *Please limit your response to 2000 characters.*
Zinc Resources LLC (Zinc Resources) is proposing to install a greenfield EAF Steel Dust Recycling Plant in Live Oak County, Texas (Recycling Plant). Zinc Resources is proposing to construct an EAF Dust Recycling Plant utilizing one Waelz Kiln (FIN: KILN-1) to produce Waelz Zinc Oxide (WZO) and Waelz Iron Product (WIP) from Electric Arc Furnace (EAF) dust generated at steel mini mills. An associated building with baghouse (FIN: BH-1), bin vent filters (FIN: BVF 1-3), aggregate handling operations (FIN: WIP1 – WIP3), emergency generator (FIN: EMGEN1), and a diesel tank (FIN: T1) are present as part of the process. Please see the application narrative for a detailed description of items being authorized by this project.

II. Air Dispersion Modeling Preliminary Information			
Instructions: Fill in the information below based on your modeling setup. The selections chosen in this sheet will carry throughout the sheet and workbook. Based on selections below, only portions of the sheet and workbook will be available. Therefore, it is vital the sheet and workbook are filled out in order, do NOT skip around. For larger text boxes, double click to type or insert text.			
A. Type of Model Used: *Select "X" in all that apply*			
	AERSCREEN	X	AERMOD
19191	Enter in all applicable Model Version(s).		
B. Building Downwash			
Yes	Is downwash applicable? *(Select "Yes" or "No")*		
4274	Enter BPIP version (AERMOD and ISCPrime only).		
C. Type of Analyses: (Select "X" in all that apply) *PSD projects should submit a protocol and not utilize this form.			
X	Minor NSR NAAQS	X	State Property Line
X	Health Effects		
D. Constituents Evaluating: (Select "X" in all that apply)			
NAAQS: List all pollutants that require a modeling review. *(Select "X" in all that apply)*			
X	SO_2	X	PM_{10}
X	CO	X	$PM_{2.5}$
X	Pb	X	NO_2
Both	Identify which averaging periods are being evaluated for NO_2.		
Tier 2: ARM 2	Identify the 1-hr NO_2 tier used for the AERMOD or AERSCREEN analyses.		
Tier 2: ARM 2	Identify the annual NO_2 tier used for the AERMOD or AERSCREEN analyses.		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

State Property Line: List all pollutants that require a modeling review. *(Select "X" in all that apply)*			
	H_2S	X	SO_2
	H_2SO_4		
Health Effects: Fill in the Speciated Emissions sheet with all applicable pollutants, CAS numbers, and ESLs.			
E. Dispersion Options: *If "Urban" has been selected and this project is using AERMOD or AERSCREEN, include the population used. Select "X" in the box to select an option.*			
	Urban		
X	Rural		
Provide any additional justification on the dispersion option selected above:			
F. Determination of Surface Roughness: *If AERSCREEN or AERMOD is used, fill out the section below.*			
Select basis for surface roughness:	AERSURFACE		
Select "X" in one of the three surface roughness categories:			
X	Low		Medium
			High
If you are using AERSURFACE, please complete the following section:			
20060	AERSURFACE Version Number		
699017.8	Center UTM Easting (meters)	3175791.7	Center UTM Northing (meters)
1	Study Radius (km)		
No	Airport? (Select Yes or No)		
No	Continuous Snow Cover (Select Yes or No)		
Average	Surface Moisture (Select Wet, Dry, or Average)		
No	Arid Region? (Select Yes or No)		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Model Options

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Default		Month/Season Assignment	
G. Meteorological Data:			
If AERMOD and/or ISC/ISCPrime are selected, please complete the following section:			
12912		Surface Station	
12924		Upper Air Station	
35.7	Meters (m)	Profile Base Elevation (AERMOD only)	
19191		AERMET Version Number	
Yes	Was TCEQ pre-processed data used?	Both	Years used
Please enter the year(s) selected for this meteorological data:			
2016	1 Year	2014-2018	5 Years
All except PM2.5		Which analysis(es) relied on 1 year?	
PM2.5		Which analysis(es) relied on 5 years?	
Provide any other justification for Meteorological Data, as applicable.			
H. Receptor Grid:			
For AERMOD or ISC/ISCPrime, fill in the following information on your modeled receptor grid. Note: Receptor grid resolution (tight, fine, medium, coarse) are based on recommended receptor grid spacing per the AQMG, if something outside of this is used, fully describe it below.			
25	Meters (m)	Tight Receptor Spacing	
300	Meters (m)	Tight Receptor Distance	
100	Meters (m)	Fine Receptor Spacing	
1000	Meters (m)	Fine Receptor Distance	
500	Meters (m)	Medium Receptor Spacing	
5000	Meters (m)	Medium Receptor Distance	
1000	Meters (m)	Coarse Receptor Spacing	
20000	Meters (m)	Coarse Receptor Distance	
Describe any other receptor grid designs (over water, GLC_{ni}, SPLD etc.):			
I. Terrain:			
X	Elevated		
18081	AERMAP Version.		
For additional justification on terrain selection, fill in the box below:			

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Building Downwash

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Downwash Type	Modeled Building ID	Tank Diameter (m)	Number of Tiers	Maximum Height (m)	Tier 1 Height (m)
Building	BHB-2		1	12.192	12.192
Building	DSC		1	24.6888	24.6888
Building	MT		1	30.48	30.48
Building	WZO		1	6.096	6.096
Building	WIP		1	6.096	6.096
Other: Downwash structure for volume source calculations only.	T1		1	3.048	3.048
Building	BHB-1		1	9.144	9.144

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Point Source Parameters

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Modeling Scenario	Source Description	Point Source Type	Point Source Justification	Easting: X [m]	Northing: Y [m]	Base Elevation [m]	Height [m]	Exit Temperature [K]	Exit Velocity [m/s]	Diameter [m]
BH-1	BH1		Mix Building - West	POINT	Vertical Stack	699000.31	3175714.32	11.32	27.43	0.000	17.779	1.388
KILN-1	KILN1		Waelz Kiln	POINT	Vertical Stack	699066.10	3175809.70	11.61	30.00	433.150	11.537	2.500
BVF-1	BVF1		Bin Vent Filter 1	POINT	Vertical Stack	699101.50	3175742.70	11.51	15.24	0.000	4.121	0.540
BVF-2	BVF2		Bin Vent Filter 2	POINT	Vertical Stack	699119.60	3175755.40	11.55	15.24	0.000	4.121	0.540
EMGEN1	EMGEN1		Emergency Generator 1	POINT	Vertical Stack	699024.10	3175834.50	11.64	3.05	997.000	49.987	0.149
BH-2	BH2		Mix Building - East	POINT	Vertical Stack	699010.70	3175722.10	11.34	27.43	0.000	17.779	1.388
BH-3	BH3		Railroad Unloading - West	POINT	Vertical Stack	699011.30	3175685.10	11.33	27.43	0.000	17.778	0.780
BH-4	BH4		Railroad Unloading - East	POINT	Vertical Stack	699029.30	3175698.10	11.36	27.43	0.000	17.778	0.780

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Volume Source Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Footprint of Source Length (m)	Footprint of Source Width (m)	Length of Side (making it a square) SQRT(L * W)	Type of Volume Source (sigma y) *Pick from drop-down*	**Sigma Y** (m)	Vertical Span Min Release (m)	Vertical Span Max Release (m)	Vertical Dimension (m)
T1	T1A	3.66	3.05	3.34	Multiple Volumes: Adjacent Volume Sources	1.55	3.05	3.05	0.00
WIPB	WIPB	35.00	70.00	49.50	Single Volume Source	11.51	0.00	6.10	6.10
T1	T1B	3.66	3.05	3.34	Multiple Volumes: Adjacent Volume Sources	1.55	3.05	3.05	0.00
T1	T1C	3.66	3.05	3.34	Multiple Volumes: Adjacent Volume Sources	1.55	3.05	3.05	0.00

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Volume Source Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Type of Volume Source (sigma z) *Pick from drop-down*	Release Height (middle point of vertical span) (m)	Building Name (if on/adjacent to a building) *Pick from drop-down*	Adjacent Building Height, if applicable (m)	**Sigma Z** (m)
Elevated Source: On or adjacent to Building	3.05	T1	3.05	1.42
Surface-Based Source	3.05			2.84
Elevated Source: On or adjacent to Building	3.05	T1	3.05	1.42
Elevated Source: On or adjacent to Building	3.05	T1	3.05	1.42

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Volume Source Parameters

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Modeled Release Height [m]	Modeled Length X [m]	Lateral Dimension SigmaY [m]	Vertical Dimension SigmaZ [m]	Modeling Scenario	Easting: X [m]	Northing: Y [m]	Base Elevation [m]	Source Description	Volume Source Size Justification
T1	T1A	3.05	3.34	1.55	1.42		699018.50	3175831.20	11.62	Diesel Tank A	Emissions released from multiple roof vents at the top of tank
WIPB	WIPB	3.05	49.50	11.51	2.84		698965.60	3175882.30	11.63	WIP Building Drop Points	Fugitive emissions from drop points inside enclosed building
T1	T1B	3.05	3.34	1.55	1.42		699018.50	3175838.52	11.64	Diesel Tank B	Emissions released from multiple roof vents at the top of tank
T1	T1C	3.05	3.34	1.55	1.42		699018.50	3175823.88	11.59	Diesel Tank C	Emissions released from multiple roof vents at the top of tank

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Point + Flare Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent Source?	Modeled Emission Rate [lb/hr]	Basis of Emission Rate	Scalars or Factors Used?	Scalar/Factor in Use
BH-1	BH1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	2.06	Site Wide Emissions	No	
BVF-1	BVF1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	Yes	0.0138	Site Wide Emissions	No	
BH-2	BH2	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
BH-1	BH1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	2.06	Site Wide Emissions	No	
BVF-1	BVF1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	Yes	0.0138	Site Wide Emissions	No	
BH-2	BH2	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
BH-1	BH1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	2.06	Site Wide Emissions	No	
BVF-1	BVF1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.00378	Site Wide Emissions	No	
BH-2	BH2	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.463	Site Wide Emissions	No	
KILN-1	KILN1	0	NOx	1-hr	NAAQS	Minor Full NAAQS	No	13.83	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	NOx	1-hr	NAAQS	Minor Full NAAQS	Yes	0.106	Site Wide Emissions	No	
KILN-1	KILN1	0	CO	1-hr	NAAQS	SIL analysis	No	22.71	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	CO	1-hr	NAAQS	SIL analysis	No	5.79	Site Wide Emissions	No	
KILN-1	KILN1	0	CO	8-hr	NAAQS	SIL analysis	No	22.71	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	CO	8-hr	NAAQS	SIL analysis	No	5.79	Site Wide Emissions	No	
KILN-1	KILN1	0	SO2	1-hr	NAAQS	SIL analysis	No	1.70	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	SO2	1-hr	NAAQS	SIL analysis	Yes	1.24E-04	Site Wide Emissions	No	
KILN-1	KILN1	0	SO2	3-hr	NAAQS	SIL analysis	No	1.70	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	SO2	3-hr	NAAQS	SIL analysis	No	0.0109	Site Wide Emissions	No	
BH-1	BH1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.0198	Site Wide Emissions	No	
KILN-1	KILN1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.0666	Site Wide Emissions	No	
BVF-1	BVF1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.00167	Site Wide Emissions	No	
BVF-2	BVF2	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.00167	Site Wide Emissions	No	
BH-2	BH2	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.0198	Site Wide Emissions	No	
BH-3	BH3	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.00625	Site Wide Emissions	No	
BH-4	BH4	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	0.00625	Site Wide Emissions	No	
BH-1	BH1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
KILN-1	KILN1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BVF-1	BVF1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BVF-2	BVF2	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-2	BH2	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-3	BH3	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-4	BH4	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-1	BH1	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
KILN-1	KILN1	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BVF-1	BVF1	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BVF-2	BVF2	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
EMGEN1	EMGEN1	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-2	BH2	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-3	BH3	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-4	BH4	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-1	BH1	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
KILN-1	KILN1	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
BVF-1	BVF1	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
BVF-2	BVF2	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
EMGEN1	EMGEN1	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-2	BH2	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-3	BH3	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
BH-4	BH4	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
KILN-1	KILN1	0	SO2	1-hr	State Property Line	Site Wide	No	1.70	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	SO2	1-hr	State Property Line	Site Wide	No	0.0109	Site Wide Emissions	No	
BH-1	BH1	0	PM10	24-hr	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM10	24-hr	NAAQS	SIL analysis	No	2.06	Site Wide Emissions	No	
BVF-1	BVF1	0	PM10	24-hr	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM10	24-hr	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM10	24-hr	NAAQS	SIL analysis	Yes	0.0138	Site Wide Emissions	No	
BH-2	BH2	0	PM10	24-hr	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM10	24-hr	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM10	24-hr	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
BH-1	BH1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	2.06	Site Wide Emissions	No	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Point + Flare Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent Source?	Modeled Emission Rate [lb/hr]	Basis of Emission Rate	Scalars or Factors Used?	Scalar/Factor in Use
BVF-1	BVF1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM2.5	24-hr	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM2.5	24-hr	NAAQS	SIL analysis	Yes	0.0138	Site Wide Emissions	No	
BH-2	BH2	0	PM2.5	24-hr	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM2.5	24-hr	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM2.5	24-hr	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
BH-1	BH1	0	PM2.5	Annual	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
KILN-1	KILN1	0	PM2.5	Annual	NAAQS	SIL analysis	No	2.06	Site Wide Emissions	No	
BVF-1	BVF1	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
BVF-2	BVF2	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.0514	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.00378	Site Wide Emissions	No	
BH-2	BH2	0	PM2.5	Annual	NAAQS	SIL analysis	No	1.47	Site Wide Emissions	No	
BH-3	BH3	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
BH-4	BH4	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.463	Site Wide Emissions	No	
KILN-1	KILN1	0	NOx	1-hr	NAAQS	SIL analysis	No	13.83	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	NOx	1-hr	NAAQS	SIL analysis	Yes	0.106	Site Wide Emissions	No	
KILN-1	KILN1	0	NOx	Annual	NAAQS	SIL analysis	No	13.83	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	NOx	Annual	NAAQS	SIL analysis	No	0.106	Site Wide Emissions	No	
EMGEN1	EMGEN1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-1	BH1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
KILN-1	KILN1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
BVF-1	BVF1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
BVF-2	BVF2	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-2	BH2	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-3	BH3	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
BH-4	BH4	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
EMGEN1	EMGEN1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Volume Source Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent Source?	Modeled Emission Rate [lb/hr]	Basis of Emission Rate	Scalars or Factors Used?	Scalar/Factor in Use
T1	T1A	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
T1	T1A	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
WIPB	WIPB	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	0.175	Site Wide Emissions	No	
WIPB	WIPB	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	0.0266	Site Wide Emissions	No	
WIPB	WIPB	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	0.0193	Site Wide Emissions	No	
T1	T1A	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
T1	T1A	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
WIPB	WIPB	0	PM10	24-hr	NAAQS	SIL analysis	No	0.175	Site Wide Emissions	No	
WIPB	WIPB	0	PM2.5	24-hr	NAAQS	SIL analysis	No	0.0266	Site Wide Emissions	No	
WIPB	WIPB	0	PM2.5	Annual	NAAQS	SIL analysis	No	0.0193	Site Wide Emissions	No	
T1	T1B	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
T1	T1B	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
T1	T1C	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No		Site Wide Emissions	No	
T1	T1C	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No		Site Wide Emissions	No	
T1	T1B	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
T1	T1B	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	
T1	T1C	0	Generic	1-hr			No	1.00	Generic Modeling at 1 lb/hr	No	
T1	T1C	0	Generic	Annual			No	1.00	Generic Modeling at 1 lb/hr	No	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Speciated Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Speciated Emissions by Model ID

CAS #	Chemical Species	Other Species	Short-Term ESL (µg/m³)	Long-Term ESL (µg/m³)	Modeled Project Wide Emission Rate [lb/hr] BH1	Modeled Site Wide Emission Rate [lb/hr] BH1	Modeled Project Wide Emission Rate [tpy] BH1	Modeled Site Wide Emission Rate [tpy] BH1
68476-30-2	fuel oil No. 2		1000	100	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-43-9	cadmium		5.4	0.0033	8.79E-04	8.79E-04	0.00385	0.00385
7782-50-5	chlorine		43	2.6	0.0264	0.0264	0.116	0.116
7439-96-5	manganese		2.7	0.25	0.0410	0.0410	0.180	0.180

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Speciated Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Speciated Emissions b

CAS #	Modeled Project Wide Emission Rate [lb/hr] KILN1	Modeled Site Wide Emission Rate [lb/hr] KILN1	Modeled Project Wide Emission Rate [tpy] KILN1	Modeled Site Wide Emission Rate [tpy] KILN1	Modeled Project Wide Emission Rate [lb/hr] BVF1	Modeled Site Wide Emission Rate [lb/hr] BVF1	Modeled Project Wide Emission Rate [tpy] BVF1	Modeled Site Wide Emission Rate [tpy] BVF1	Modeled Project Wide Emission Rate [lb/hr] BVF2	Modeled Site Wide Emission Rate [lb/hr] BVF2	Modeled Project Wide Emission Rate [tpy] BVF2	Modeled Site Wide Emission Rate [tpy] BVF2
68476-30-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-43-9	0.00329	0.00329	0.0144	0.0144	8.23E-05	8.23E-05	3.60E-04	3.60E-04	8.23E-05	8.23E-05	3.60E-04	3.60E-04
7782-50-5	0.0967	0.0967	0.423	0.423	0.00242	0.00242	0.0106	0.0106	0.00242	0.00242	0.0106	0.0106
7439-96-5	0.00411	0.00411	0.0180	0.0180	1.03E-04	1.03E-04	4.51E-04	4.51E-04	1.03E-04	1.03E-04	4.51E-04	4.51E-04

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Speciated Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Speciated Emissions b

CAS #	Modeled Project Wide Emission Rate [lb/hr] BH2	Modeled Site Wide Emission Rate [lb/hr] BH2	Modeled Project Wide Emission Rate [tpy] BH2	Modeled Site Wide Emission Rate [tpy] BH2	Modeled Project Wide Emission Rate [lb/hr] BH3	Modeled Site Wide Emission Rate [lb/hr] BH3	Modeled Project Wide Emission Rate [tpy] BH3	Modeled Site Wide Emission Rate [tpy] BH3	Modeled Project Wide Emission Rate [lb/hr] BH4	Modeled Site Wide Emission Rate [lb/hr] BH4	Modeled Project Wide Emission Rate [tpy] BH4	Modeled Site Wide Emission Rate [tpy] BH4
68476-30-2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7440-43-9	8.79E-04	8.79E-04	0.00385	0.00385	2.78E-04	2.78E-04	0.00122	0.00122	2.78E-04	2.78E-04	0.00122	0.00122
7782-50-5	0.0264	0.0264	0.116	0.116	0.00833	0.00833	0.0365	0.0365	0.00833	0.00833	0.0365	0.0365
7439-96-5	0.0410	0.0410	0.180	0.180	0.0130	0.0130	0.0568	0.0568	0.0130	0.0130	0.0568	0.0568

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Speciated Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Speciated Emissions b

CAS #	Modeled Project Wide Emission Rate [lb/hr] EMGEN1	Modeled Site Wide Emission Rate [lb/hr] EMGEN1	Modeled Project Wide Emission Rate [tpy] EMGEN1	Modeled Site Wide Emission Rate [tpy] EMGEN1	Modeled Project Wide Emission Rate [lb/hr] T1A	Modeled Site Wide Emission Rate [lb/hr] T1A	Modeled Project Wide Emission Rate [tpy] T1A	Modeled Site Wide Emission Rate [tpy] T1A	Modeled Project Wide Emission Rate [lb/hr] T1B	Modeled Site Wide Emission Rate [lb/hr] T1B	Modeled Project Wide Emission Rate [tpy] T1B	Modeled Site Wide Emission Rate [tpy] T1B	Modeled Project Wide Emission Rate [lb/hr] T1C	Modeled Site Wide Emission Rate [lb/hr] T1C	Modeled Project Wide Emission Rate [tpy] T1C	Modeled Site Wide Emission Rate [tpy] T1C
68476-30-2	1.31	1.31	0.0656	0.0656	0.128	0.128	0.00631	0.00631	0.128	0.128	0.00631	0.00631	0.128	0.128	0.00631	0.00631
7440-43-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7782-50-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
7439-96-5	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Combined Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent	Source Type	Modeled Emission Rate [lb/hr]
BH-1	BH1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	1.47
KILN-1	KILN1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	2.06
BVF-1	BVF1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.05
BVF-2	BVF2	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.05
EMGEN1	EMGEN1	0	PM10	24-hr	NAAQS	Minor Full NAAQS	Yes	Point	0.01
BH-2	BH2	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	1.47
BH-3	BH3	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.46
BH-4	BH4	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.46
BH-1	BH1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	1.47
KILN-1	KILN1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	2.06
BVF-1	BVF1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.05
BVF-2	BVF2	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.05
EMGEN1	EMGEN1	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	Yes	Point	0.01
BH-2	BH2	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	1.47
BH-3	BH3	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.46
BH-4	BH4	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Point	0.46
BH-1	BH1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	1.47
KILN-1	KILN1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	2.06
BVF-1	BVF1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	0.05
BVF-2	BVF2	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	0.05
EMGEN1	EMGEN1	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	0.00
BH-2	BH2	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	1.47
BH-3	BH3	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	0.46
BH-4	BH4	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Point	0.46
KILN-1	KILN1	0	NOx	1-hr	NAAQS	Minor Full NAAQS	No	Point	13.83
EMGEN1	EMGEN1	0	NOx	1-hr	NAAQS	Minor Full NAAQS	Yes	Point	0.11
KILN-1	KILN1	0	CO	1-hr	NAAQS	SIL analysis	No	Point	22.71
EMGEN1	EMGEN1	0	CO	1-hr	NAAQS	SIL analysis	No	Point	5.79
KILN-1	KILN1	0	CO	8-hr	NAAQS	SIL analysis	No	Point	22.71
EMGEN1	EMGEN1	0	CO	8-hr	NAAQS	SIL analysis	No	Point	5.79
KILN-1	KILN1	0	SO2	1-hr	NAAQS	SIL analysis	No	Point	1.70
EMGEN1	EMGEN1	0	SO2	1-hr	NAAQS	SIL analysis	Yes	Point	0.00
KILN-1	KILN1	0	SO2	3-hr	NAAQS	SIL analysis	No	Point	1.70
EMGEN1	EMGEN1	0	SO2	3-hr	NAAQS	SIL analysis	No	Point	0.01
BH-1	BH1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.02
KILN-1	KILN1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.07
BVF-1	BVF1	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.00
BVF-2	BVF2	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.00
BH-2	BH2	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.02
BH-3	BH3	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.01
BH-4	BH4	0	Pb	Monthly (Pb only)	NAAQS	Minor Full NAAQS	No	Point	0.01
BH-1	BH1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
KILN-1	KILN1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BVF-1	BVF1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BVF-2	BVF2	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BH-2	BH2	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BH-3	BH3	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BH-4	BH4	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BH-1	BH1	0	Generic	1-hr			No	Point	1.00
KILN-1	KILN1	0	Generic	1-hr			No	Point	1.00
BVF-1	BVF1	0	Generic	1-hr			No	Point	1.00
BVF-2	BVF2	0	Generic	1-hr			No	Point	1.00
EMGEN1	EMGEN1	0	Generic	1-hr			No	Point	1.00
BH-2	BH2	0	Generic	1-hr			No	Point	1.00
BH-3	BH3	0	Generic	1-hr			No	Point	1.00
BH-4	BH4	0	Generic	1-hr			No	Point	1.00
BH-1	BH1	0	Generic	Annual			No	Point	1.00
KILN-1	KILN1	0	Generic	Annual			No	Point	1.00
BVF-1	BVF1	0	Generic	Annual			No	Point	1.00
BVF-2	BVF2	0	Generic	Annual			No	Point	1.00
EMGEN1	EMGEN1	0	Generic	Annual			No	Point	1.00
BH-2	BH2	0	Generic	Annual			No	Point	1.00
BH-3	BH3	0	Generic	Annual			No	Point	1.00
BH-4	BH4	0	Generic	Annual			No	Point	1.00
KILN-1	KILN1	0	SO2	1-hr	State Property Line	Site Wide	No	Point	1.70
EMGEN1	EMGEN1	0	SO2	1-hr	State Property Line	Site Wide	No	Point	0.01
BH-1	BH1	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	1.47
KILN-1	KILN1	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	2.06
BVF-1	BVF1	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	0.05
BVF-2	BVF2	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	0.05
EMGEN1	EMGEN1	0	PM10	24-hr	NAAQS	SIL analysis	Yes	Point	0.01
BH-2	BH2	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	1.47
BH-3	BH3	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	0.46
BH-4	BH4	0	PM10	24-hr	NAAQS	SIL analysis	No	Point	0.46
BH-1	BH1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	1.47
KILN-1	KILN1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	2.06
BVF-1	BVF1	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	0.05
BVF-2	BVF2	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	0.05
EMGEN1	EMGEN1	0	PM2.5	24-hr	NAAQS	SIL analysis	Yes	Point	0.01
BH-2	BH2	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	1.47
BH-3	BH3	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	0.46
BH-4	BH4	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Point	0.46
BH-1	BH1	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	1.47
KILN-1	KILN1	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	2.06
BVF-1	BVF1	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	0.05
BVF-2	BVF2	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	0.05
EMGEN1	EMGEN1	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	0.00
BH-2	BH2	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	1.47

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Combined Emissions

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

EPN	Model ID	Modeling Scenario	Pollutant	Modeled Averaging Time	Standard Type	Review Context	Intermittent	Source Type	Modeled Emission Rate [lb/hr]
BH-3	BH3	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	0.46
BH-4	BH4	0	PM2.5	Annual	NAAQS	SIL analysis	No	Point	0.46
KILN-1	KILN1	0	NOx	1-hr	NAAQS	SIL analysis	No	Point	13.83
EMGEN1	EMGEN1	0	NOx	1-hr	NAAQS	SIL analysis	Yes	Point	0.11
KILN-1	KILN1	0	NOx	Annual	NAAQS	SIL analysis	No	Point	13.83
EMGEN1	EMGEN1	0	NOx	Annual	NAAQS	SIL analysis	No	Point	0.11
EMGEN1	EMGEN1	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Point	--
BH-1	BH1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
KILN-1	KILN1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
BVF-1	BVF1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
BVF-2	BVF2	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
BH-2	BH2	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
BH-3	BH3	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
BH-4	BH4	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
EMGEN1	EMGEN1	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Point	--
T1	T1A	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Volume	--
T1	T1A	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Volume	--
WIPB	WIPB	0	PM10	24-hr	NAAQS	Minor Full NAAQS	No	Volume	0.18
WIPB	WIPB	0	PM2.5	24-hr	NAAQS	Minor Full NAAQS	No	Volume	0.03
WIPB	WIPB	0	PM2.5	Annual	NAAQS	Minor Full NAAQS	No	Volume	0.02
T1	T1A	0	Generic	1-hr			No	Volume	1.00
T1	T1A	0	Generic	Annual			No	Volume	1.00
WIPB	WIPB	0	PM10	24-hr	NAAQS	SIL analysis	No	Volume	0.18
WIPB	WIPB	0	PM2.5	24-hr	NAAQS	SIL analysis	No	Volume	0.03
WIPB	WIPB	0	PM2.5	Annual	NAAQS	SIL analysis	No	Volume	0.02
T1	T1B	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Volume	--
T1	T1B	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Volume	--
T1	T1C	0	Health Effects Pollutant	1-hr	Health Effects	Site Wide	No	Volume	--
T1	T1C	0	Health Effects Pollutant	Annual	Health Effects	Site Wide	No	Volume	--
T1	T1B	0	Generic	1-hr			No	Volume	1.00
T1	T1B	0	Generic	Annual			No	Volume	1.00
T1	T1C	0	Generic	1-hr			No	Volume	1.00
T1	T1C	0	Generic	Annual			No	Volume	1.00

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Intermittent Sources

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Pollutant	Review Context	Modeling Scenario	Modeled Emission Rate (lb/hr)	Emergency Engine?	Maximum Emission Rate (lb/hr)	# Events per year	Hours per Event	Hours per Year	Calculated emission rate (lb/hr)	List Intermittent Sources operating simultaneously	Describe any other justification for intermittent
EMGEN1	EMGEN1	PM10	Minor Full NAAQS	0	0.0138	Yes	0.331	365	1	365	0.0138	No Other Intermittent Sources Operating	Under normal operation, EMGEN will be operated up to an hour in a 24-hr period but is permitted for only 100-hr per year. Conservatively modeled 1-hr per day (365 hr/yr) for the 24-hr averaging period.
EMGEN1	EMGEN1	PM2.5	Minor Full NAAQS	0	0.0138	Yes	0.331	365	1	365	0.0138	No Other Intermittent Sources Operating	Under normal operation, EMGEN will operated up to an hour in a 24-hr period but is permitted for only 100-hr per year. Conservatively model 1-hr per day (365 hr/yr) for the 24-hr averaging period.
EMGEN1	EMGEN1	NOx	Minor Full NAAQS	0	0.106	Yes	9.27	100	1	100	0.106	No Other Intermittent Sources Operating	Permitted at 100 hr/yr
EMGEN1	EMGEN1	SO2	SIL analysis	0	1.24E-04	Yes	0.0109	100	1	100	1.24E-04	No Other Intermittent Sources Operating	Permitted at 100 hr/yr
EMGEN1	EMGEN1	PM10	SIL analysis	0	0.0138	Yes	0.331	365	1	365	0.0138	No Other Intermittent Sources Operating	Under normal operation, EMGEN will be operated up to an hour in a 24-hr period but is permitted for only 100-hr per year. Conservatively modeled 1-hr per day (365 hr/yr) for the 24-hr averaging period.
EMGEN1	EMGEN1	PM2.5	SIL analysis	0	0.0138	Yes	0.331	365	1	365	0.0138	No Other Intermittent Sources Operating	Under normal operation, EMGEN will be operated up to an hour in a 24-hr period but is permitted for only 100-hr per year. Conservatively modeled 1-hr per day (365 hr/yr) for the 24-hr averaging period.
EMGEN1	EMGEN1	NOx	SIL analysis	0	0.106	Yes	9.27	100	1	100	0.106	No Other Intermittent Sources Operating	Permitted at 100 hr/yr

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Monitor Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**$PM_{2.5}$**			
AQS ID:	483550034		**Street Address and City:**	5707 Up River Rd, Corpus Christi
Link to Data Source:	https://www.epa.gov/outdoor-air-quality-data/download-daily-data		**County:**	Nueces
Select metric for short term averaging time below:	**1st Year Concentration ($\mu g/m^3$)**	**2nd Year Concentration ($\mu g/m^3$)**	**3rd Year (most recent) Concentration ($\mu g/m^3$)**	**Calculated Background Concentration ($\mu g/m^3$)**
24-hr 98 percentile	18.41600	27.36600	21.16000	22
Annual Average	7.95172	7.99500	8.18197	8.0

Pollutant:	**NO_2**			
AQS ID:	482450628		**Street Address and City:**	6956 James Gamble Drive
Link to Data Source:	https://www.tceq.texas.gov/cgi-bin/compliance/monops/yearly_summary.pl		**County:**	Jefferson
Select metric for short term averaging time below:	**1st Year Concentration ($\mu g/m^3$)**	**2nd Year Concentration ($\mu g/m^3$)**	**3rd Year (most recent) Concentration ($\mu g/m^3$)**	**Calculated Background Concentration ($\mu g/m^3$)**
1-hr 98 percentile	53.58000	88.36000	54.89600	66
Annual Average			9.40000	9

Pollutant:	**SO_2**			
AQS ID:			**Address:**	N/A
Link to Data Source:	N/A		**County:**	
Select metric for short term averaging time below:	**1st Year Concentration ($\mu g/m^3$)**	**2nd Year Concentration ($\mu g/m^3$)**	**3rd Year (most recent) Concentration ($\mu g/m^3$)**	**Calculated Background Concentration ($\mu g/m^3$)**
Choose an item				0
Choose an item				0
Choose an item				0
Annual Average				0

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Monitor Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	PM_{10}			
AQS ID:	483550034		**Address:**	5707 Up River Rd, Corpus Christi
Link to Data Source:	https://www.epa.gov/outdoor-air-quality-data/download-daily-data		**County:**	Nueces
Select metric for short term averaging time below:	**1st Year Concentration ($\mu g/m^3$)**	**2nd Year Concentration ($\mu g/m^3$)**	**3rd Year (most recent) Concentration ($\mu g/m^3$)**	**Calculated Background Concentration ($\mu g/m^3$)**
H1H 24-hr Avg	43.00000	79.00000	44.00000	79

Pollutant:	CO			
AQS ID:			**Address:**	N/A
Link to Data Source:	N/A		**County:**	
Select metric for short term averaging time below:	**1st Year Concentration ($\mu g/m^3$)**	**2nd Year Concentration ($\mu g/m^3$)**	**3rd Year (most recent) Concentration ($\mu g/m^3$)**	**Calculated Background Concentration ($\mu g/m^3$)**
Choose an item				0
Choose an item				0

Pollutant:	Pb		
AQS ID:	482570020	**Address:**	2988 Temtex Blvd, Terrell
Link to Data Source:	https://www.epa.gov/outdoor-air-quality-data/monitor-values-report	**County:**	Kaufman
Select metric for short term averaging time below:	**Concentration ($\mu g/m^3$) from 38 Month Sample Period**	**Calculated Background Concentration ($\mu g/m^3$)**	
H1H Rolling 3-month Avg	0.0400	0.0400	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Monitor Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Monitor Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

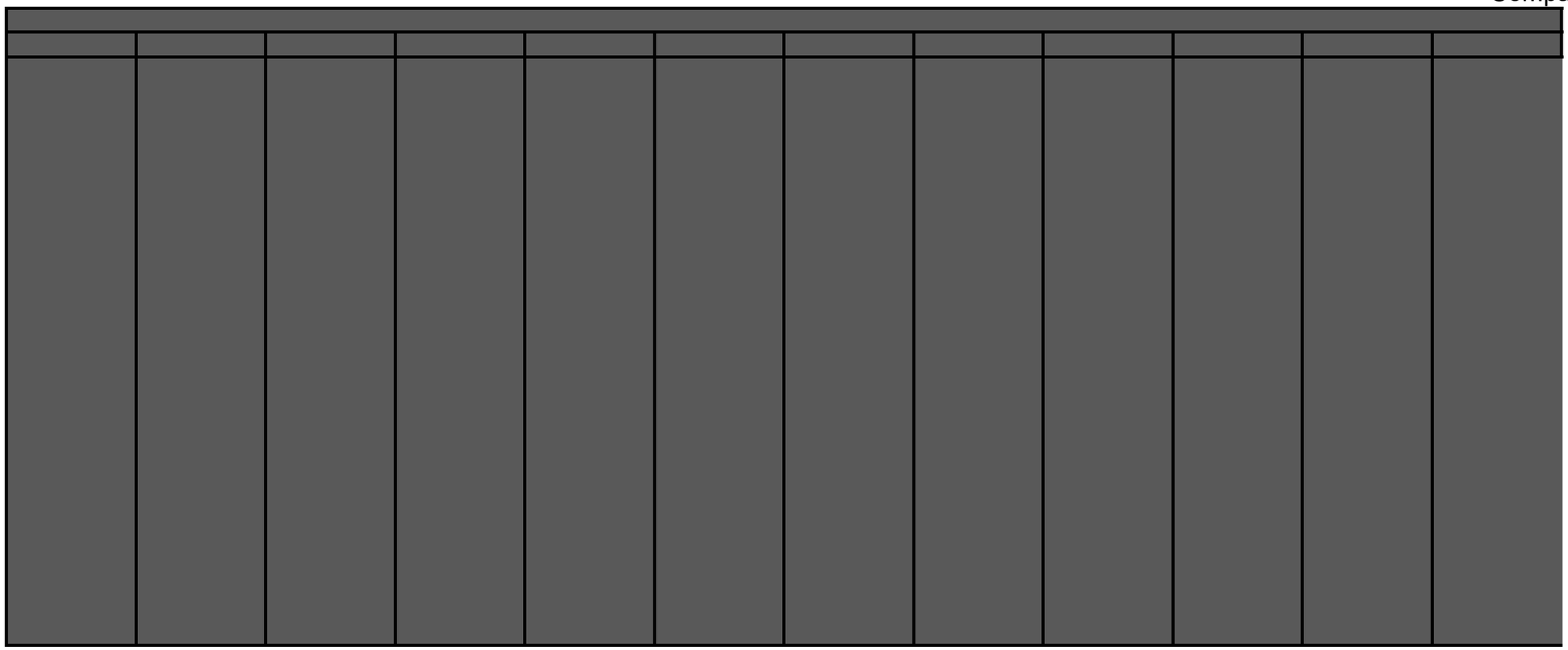
Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Monitor Calculations

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC



Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**$PM_{2.5}$**
AQS ID:	483550034
County:	Nueces
Distance to Project Site (km):	121.6

Monitor Justification Data

Category:	10 Kilometer $PM_{2.5}$ Emissions Comparison	Types of Nearby Sources	County $PM_{2.5}$ Emissions Comparison	County Population Comparison	Land Use Comparison	Regional Considerations
Project:	65.93	Industrial	102.18	92084	mixed industrial/residential	General Texas Land
Monitor:	983.65	Industrial	1198.1903	362294	mixed industrial/residential	General Texas Land
Data Source:	2019 TCEQ EI		2019 TCEQ EI	US Census Bureau		

Additional Information

How are off-property sources accounted for?	A conservative background monitor was used in lieu of explicitly modeling off-property sources considering the quantity of emissions near the monitor is nearly 15 times the quantity of emissions near the project site.
Monitoring data set year(s)/Additional Justification:	2017-2019

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**NO_2**
AQS ID:	482450628
County:	Jefferson
Distance to Project Site (km):	211.9

Monitor Justification Data

Category:	10 Kilometer NO_2 Emissions Comparison	Types of Nearby Sources	County NO_2 Emissions Comparison	County Population Comparison	Land Use Comparison	Regional Considerations
Project:	3281.5854	Industrial	3416.7458	92084	mixed industrial/residential	General Texas Land
Monitor:	4565.5731	Industrial	10087.0286	9590.9462	mixed industrial/residential	General Texas Land
Data Source:	2019 TCEQ EI		2019 TCEQ EI	US Census Bureau		

Additional Information

How are off-property sources accounted for?	A conservative background monitor was used in lieu of explicitly modeling off-property sources considering the quantity of emissions near the monitor compared to the quantity of emissions near the project site.
Monitoring data set year(s)/Additional Justification:	2017-2019

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**SO_2**
AQS ID:	
County:	
Distance to Project Site (km):	

Monitor Justification Data						
Category:	**10 Kilometer SO_2 Emissions Comparison**	**Types of Nearby Sources**	**County SO_2 Emissions Comparison**	**County Population Comparison**	**Land Use Comparison**	**Regional Considerations**
Project:						
Monitor:						
Data Source:						

Additional Information	
How are off-property sources accounted for?	
Monitoring data set year(s)/Additional Justification:	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**PM_{10}**
AQS ID:	483550034
County:	Nueces
Distance to Project Site (km):	121.6

Monitor Justification Data

Category:	10 Kilometer PM_{10} Emissions Comparison	Types of Nearby Sources	County PM_{10} Emissions Comparison	County Population Comparison	Land Use Comparison	Regional Considerations
Project:	82.8877	Industrial	125.2917	92084	mixed industrial/residential	General Texas Land
Monitor:	1203.3707	Industrial	1471.2185	362294	mixed industrial/residential	General Texas Land
Data Source:	2019 TCEQ EI		2019 TCEQ EI	US Census Bureau		

Additional Information

How are off-property sources accounted for?	The conservative bbackground monitor was used in lieu of explicitly modeling off-property sources considering the quantity of emissions near the monitor compared to the quantity of emissions near the project site.
Monitoring data set year(s)/Additional Justification:	2017-2019

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**CO**
AQS ID:	
County:	
Distance to Project Site (km):	

Monitor Justification Data						
Category:	**10 Kilometer CO Emissions Comparison**	**Types of Nearby Sources**	**County CO Emissions Comparison**	**County Population Comparison**	**Land Use Comparison**	**Regional Considerations**
Project:						
Monitor:						
Data Source:						

Additional Information	
How are off-property sources accounted for?	
Monitoring data set year(s)/Additional Justification:	

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**Pb**
AQS ID:	482570020
County:	Kaufman
Distance to Project Site (km):	491.4

Monitor Justification Data

Category:	10 Kilometer Pb Emissions Comparison	Types of Nearby Sources	County Pb Emissions Comparison	County Population Comparison	Land Use Comparison	Regional Considerations
Project:	0	Industrial	0	92084	mixed industrial/residential	General Texas Land
Monitor:	0.18	Industrial	0.19	136154	mixed industrial/residential	General Texas Land
Data Source:	2019 TCEQ EI		2019 TCEQ EI	US Census Bureau		

Additional Information

How are off-property sources accounted for?	The monitor was used in lieu of explicitly modeling off-property sources considering the quantity of emissions near the monitor compared to the quantity of emissions near the project site.
Monitoring data set year(s)/Additional Justification:	2017-2020

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Pollutant:	**O_3 (for Tier 3 Analysis)**
AQS ID:	
County:	
Distance to Project Site (km):	

Category:	10 Kilometer NO_x Emissions Comparison	10 Kilometer VOC Emissions Comparison	Types of Nearby Sources	County NO_x Emissions Comparison	County VOC Emissions Comparison	County Population Comparison
Project:						
Monitor:						
Data Source:						

Additional Information

How are off-property sources accounted for?	
Additional Justification:	

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Electronic Modeling Evaluation Workbook (EMEW)

Background Justification

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Land Use Comparison	Regional Considerations

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Secondary Formation of PM2.5

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Modeled Emission Rates for Precursors (MERPs) Demonstration Tool for Calculating Secondary $PM_{2.5}$ Impacts								
			Selection of Variables		MERP Value		Total Secondary Value ($\mu g/m^3$)	
Precursor	Project Increases (tpy)	Source Selection	Emission Rate (tpy)	Height (m)	24-hr	Annual	24-hr $PM_{2.5}$	Annual $PM_{2.5}$
Nitrogen Oxide (NO_x)	61.04	worst-case			2649	10397	0.05252	0.00199
Sulfur Dioxide (SO_2)	7.439737671	worst-case			359	1820		

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

NAAQS-SPL Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Table 1. Project-Related Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr		20.42
H_2SO_4	1-hr		1
H_2SO_4	24-hr		0.3
H_2S	1-hr		2.16 *(If property is residential, recreational, business, or commercial)*
H_2S	1-hr		3.24 *(If property is not residential, recreational, business, or commercial)*

Table 2. Site-wide Modeling Results for State Property Line

Pollutant	Averaging Time	GLCmax (µg/m^3)	Standard (µg/m^3)
SO_2	1-hr	1.65612	1021
H_2SO_4	1-hr		50
H_2SO_4	24-hr		15
H_2S	1-hr		108 *(If property is residential, recreational, business, or commercial)*
H_2S	1-hr		162 *(If property is not residential, recreational, business, or commercial)*

Table 3. Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax (µg/m^3)	De Minimis (µg/m^3)
SO_2	1-hr	1.47273	7.8*
SO_2	3-hr	1.16109	25
SO_2	24-hr		5
SO_2	Annual		1
PM_{10}	24-hr	42.75577	5
NO_2	1-hr	14.15947	7.5**
NO_2	Annual	0.498	1
CO	1-hr	862.45660	2000
CO	8-hr	292.38998	500

Additional information for the De Minimis values listed above can be found at:
* https://www.epa.gov/sites/production/files/2015-07/documents/appwso2.pdf
** https://www.tceq.texas.gov/assets/public/permitting/air/memos/guidance_1hr_no2naaqs.pdf

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

NAAQS-SPL Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Table 4. $PM_{2.5}$ Modeling Results for Minor NSR De Minimis

Pollutant	Averaging Time	GLCmax ($\mu g/m^3$)	Secondary $PM_{2.5}$ Contribution ($\mu g/m^3$)	Total Conc. = Secondary $PM_{2.5}$ + GLCmax ($\mu g/m^3$)	De Minimis ($\mu g/m^3$)
$PM_{2.5}$	24-hr	15.65898	0.052519393	15.71150	1.2*
$PM_{2.5}$	Annual	3.6305	0.001991738	3.63249	0.2*

Additional information for the De Minimis values listed above can be found at:
* https://www.tceq.texas.gov/permitting/air/modeling/epa-mod-guidance.html

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

NAAQS-SPL Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Table 5. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m^3)	Background (µg/m^3)	Total Conc. = [Background + GLCmax] (µg/m^3)	Standard (µg/m^3)
SO_2	1-hr	N/A	0	#VALUE!	196
SO_2	3-hr	N/A	0	#VALUE!	1300
SO_2	24-hr	N/A	0	#VALUE!	365
SO_2	Annual	N/A	0	#VALUE!	80
PM_{10}	24-hr	42.75577	79.00	121.76	150
Pb	3-mo	0.0770	0.0400	0.117	0.15
NO_2	1-hr	14.15947	66.00	80.16	188
NO_2	Annual	N/A	9.00	#VALUE!	100
CO	1-hr	N/A	0	#VALUE!	40000
CO	8-hr	N/A	0	#VALUE!	10000

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

NAAQS-SPL Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Table 6. Total Concentrations for Minor NSR NAAQS (Concentrations > De Minimis)

Pollutant	Averaging Time	GLCmax (µg/m^3)	Secondary $PM_{2.5}$ Contribution (µg/m^3)	Background (µg/m^3)	Total Conc. = [Background + Secondary + GLCmax] (µg/m^3)	Standard (µg/m^3)
$PM_{2.5}$	24-hr	11.53961	0.052519393	22.31	33.90213	35
$PM_{2.5}$	Annual	3.63050	0.001991738	8.00	11.63249	12

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Unit Impact Multipliers

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

EPN	Model ID	Modeling Scenario	Averaging Time	GLCmax ($\mu g/m^3$ per lb/hr)	GLCmax ($\mu g/m^3$ per tpy)
BH-1	BH1	0	1-hr	31.60	
KILN-1	KILN1	0	1-hr	0.867	
BVF-1	BVF1	0	1-hr	128.14	
BVF-2	BVF2	0	1-hr	148.86	
EMGEN1	EMGEN1	0	1-hr	149.02	
BH-2	BH2	0	1-hr	31.46	
BH-3	BH3	0	1-hr	17.46	
BH-4	BH4	0	1-hr	20.86	
BH-1	BH1	0	Annual	0.632	0.144
KILN-1	KILN1	0	Annual	0.0353	0.00805
BVF-1	BVF1	0	Annual	3.33	0.761
BVF-2	BVF2	0	Annual	5.31	1.21
EMGEN1	EMGEN1	0	Annual	3.57	0.815
BH-2	BH2	0	Annual	0.656	0.150
BH-3	BH3	0	Annual	1.24	0.283
BH-4	BH4	0	Annual	1.47	0.336
T1	T1A	0	1-hr	687.59	
T1	T1A	0	Annual	14.60	3.33
T1	T1B	0	1-hr	733.51	
T1	T1B	0	Annual	16.18	3.70
T1	T1C	0	1-hr	645.09	
T1	T1C	0	Annual	13.25	3.03

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Health Effect Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Modeled Health Effect Results (MERA Guidance):				Step 3	Step 4: Production	
Chemical Species	CAS Number	Averaging Time	ESL [µg/m^3]	10% ESL Step 3 Modeled GLCmax [µg/m^3]	25 % ESL Step 4 Production GLCmax since most recent site wide modeling [µg/m^3]	10% ESL Step 4 Production Project Only GLCmax [µg/m^3]
fuel oil No. 2	68476-30-2	1-hr	1000			
fuel oil No. 2	68476-30-2	Annual	100			
cadmium	7440-43-9	1-hr	5.4			
cadmium	7440-43-9	Annual	0.0033			
chlorine	7782-50-5	1-hr	43			
chlorine	7782-50-5	Annual	2.6			
manganese	7439-96-5	1-hr	2.7			
manganese	7439-96-5	Annual	0.25			

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Health Effect Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Modeled Hea	Step 4: MSS		Step 5: MSS Only	Step 5: Hours of Exceedance			
Chemical Species	50% ESL Step 4 MSS GLCmax since most recent site wide modeling [µg/m^3]	25% ESL Step 4 MSS Project Only GLCmax [µg/m^3]	Full ESL Step 5 GLCmax [µg/m^3]	*1X ESL GLCmax* Step 5 MSS Hours of Exceedance	*2X ESL GLCmax* Step 5 MSS Hours of Exceedance	*4X ESL GLCmax* Step 5 MSS Hours of Exceedance	*10X ESL GLCmax* Step 5 MSS Hours of Exceedance
fuel oil No. 2							
fuel oil No. 2							
cadmium							
cadmium							
chlorine							
chlorine							
manganese							
manganese							

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Health Effect Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Modeled Hea	Step 6	Step 7: Site Wide			
Chemical Species	Was Step 6 relied on to fall out of the MERA?	Site Wide GLCmax [µg/m^3]	Site Wide GLCni [µg/m^3]	GLCni Location Easting: X [m]	GLCni Location Northing: Y [m]
fuel oil No. 2		381.51	381.51	N/A (UIM)	N/A (UIM)
fuel oil No. 2		0.12	0.12	N/A (UIM)	N/A (UIM)
cadmium		0.09	0.09	N/A (UIM)	N/A (UIM)
cadmium		0.00	0.00	N/A (UIM)	N/A (UIM)
chlorine		2.74	2.74	N/A (UIM)	N/A (UIM)
chlorine		0.08	0.08	N/A (UIM)	N/A (UIM)
manganese		2.84	2.84	699181.90	3175724.50
manganese		0.09	0.09	N/A (UIM)	N/A (UIM)

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Health Effect Modeling Results

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Modeled Hea Step 7: Hours of Exceedance				
Chemical Species	*1X ESL GLCni* Hours of Exceedance	*2X ESL GLCmax* Hours of Exceedance	*4X ESL GLCmax* Hours of Exceedance	*10X ESL GLCmax* Hours of Exceedance
fuel oil No. 2	0	0	0	0
fuel oil No. 2	0	0	0	0
cadmium	0	0	0	0
cadmium	0	0	0	0
chlorine	0	0	0	0
chlorine	0	0	0	0
manganese		0	0	0
manganese	0	0	0	0

Texas Commission on Environmental Quality

Electronic Modeling Evaluation Workbook (EMEW)

Modeling File Names

Date: 3/16/2021
Permit #: TBD

Company Name: Zinc Resources LLC

Facility:

Model File Base Name	Pollutant	Averaging Time	File Extensions	Additional File Description
AERSURFACE	All	All	.out	Aersurface Results
Aermap	All	All	.inp, .out, .sum	Aermap Results
Bpip	All	All	.inp, .out, .sum	Building Downwash Results
VCTCRP16L	All	All	.pfl, .sfc	TCEQ 1 Year Met Data
Manganese 1-hr_v1	Manganese	1-hr	.ami, .aml, .plt	Full Site Wide
MERA UIM_v4	UIM	All	.ami, .aml, .plt	UIM Modeling
CO 1-hr 8-hr_v3	CO	1-hr	.ami, .aml, .plt	De Minimis
CO 1-hr 8-hr_v3	CO	8-hr	.ami, .aml, .plt	De Minimis
NOx 1-hr Annual_v3	NOx	1-hr	.ami, .aml, .plt	Full NAAQS
NOx 1-hr Annual_v3	NOx	Annual	.ami, .aml, .plt	De Minimis
Pb 3 month_v4	Pb	Month	.ami, .aml, .plt	Full NAAQS
PM25 24-hr 2014-2018 v1	PM2.5	24-hr	.ami, .aml, .plt	Full NAAQS
PM25 Annual 2014-2018 v1	PM2.5	Annual	.ami, .aml, .plt	Full NAAQS
PM10 24-hr_v4	PM10	24-hr	.ami, .aml, .plt	Full NAAQS
SO2 1-hr_v3	SO2	1-hr	.ami, .aml, .plt	De Minimis
SO2 30 min 3-hr_v3	SO2	30-min	.ami, .aml, .plt	SPL
SO2 30 min 3-hr_v3	SO2	3-hr	.ami, .aml, .plt	De Minimis
VCTCRP14L18L	All	All	.pfl, .sfc	TCEQ 5 Year Met Data
PM25 24-hr 2014-2018 v1	PM2.5	24-hr	.ami, .aml, .plt	De Minimis