Statement of Basis

Permit to Construct No. P-2009.0139
Project ID 62290

Real Alloy Recycling LLC
Post Falls, Idaho

Facility ID 055-00031

Final

December 6, 2019
Chris Duerschner CD
Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

ACRONYMS, UNITS, AND CHEMICAL NOMENCLATURE

AAC	acceptable ambient concentrations
AACC	acceptable ambient concentrations for carcinogens
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EL	screening emission levels
EPA	U.S. Environmental Protection Agency
GACT	Generally Available Control Technology
HAP	hazardous air pollutants
hp	horsepower
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
NAAQS	National Ambient Air Quality Standard
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PAH	polyaromatic hydrocarbons
PM	particulate matter
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
POM	polycyclic organic matter
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	*Rules for the Control of Air Pollution in Idaho*
SM	synthetic minor
SM80	synthetic minor facility with emissions greater than or equal to 80% of a major source threshold
SO_2	sulfur dioxide
T/yr	tons per consecutive 12 calendar month period
TAP	toxic air pollutants
VOC	volatile organic compounds

FACILITY INFORMATION

Description

Real Alloy Recycling, LLC. is a secondary aluminum production facility (SIC 3341) which produces recycled scrap ingots (RSI) from the melting and recovery of aluminum and aluminum dross. The recovery of aluminum from scrap aluminum and aluminum dross and the subsequent production of aluminum ingot have been defined by EPA as a secondary aluminum production process. This facility is an area source as defined by 40 CFR 63.2 (Subpart A General Provisions) for hazardous air pollutants (HAP) and therefore subject to the requirements of 40 CFR 63, Subpart RRR.

The facility operates two rotary furnaces and associated environmental control equipment. The rotary furnaces are used to melt and extract aluminum from aluminum scrap and aluminum dross. Dross is slag from the aluminum melting and refining operations consisting of fluxing agents, impurities, oxidized and non-oxidized aluminum and/or pre-consumer aluminum scrap. These are defined as Group 1 furnaces (40 CFR 63 Subpart RRR) and all emissions are directed to Trona-injected baghouses. The baghouses are equipped with a bag leak detection system. The regulated pollutants from the emission units include criteria pollutants, dioxins and furans (D/F) and fluoride.

Dross and scrap aluminum come to the facility from several sources. Dross is brought to the dross recovery facility by dump trucks and stored inside buildings until needed. Dross is transferred from storage piles located inside the dross recovery building to the rotary furnace where it is smelted. Scrap aluminum is brought to the facility by dump trucks and stored in outdoor piles until needed. Scrap aluminum is transferred from outdoor storage piles to the rotary furnace where it is melted. The furnace is fired by natural gas. Salt flux is added into the furnaces via mobile equipment. Once the melting cycle is complete, the molten metal is poured by rotary furnaces into sow molds where it is cast, or is transported in crucibles as molten aluminum for direct product shipment.

After the aluminum is tapped, the salt is poured out of the furnace into salt cake pans and placed under a hood adjacent to the furnace. After cooling, the salt cake is moved to under roof storage bins and/or loaded into tubs that are used to load dump trucks where it is trucked to an approved landfill for disposal.

The facility currently operates a 158 horsepower (HP) diesel-fired emergency generator used to power an electric fire pump. The engine is exempt from state permitting requirements pursuant to IDAPA 58.01.222.01.d. The engine is subject to the area source requirements of 40 CFR 63, Subpart ZZZZ, and these requirements are not included in this permit.

Permitting History

The following information was derived from a review of the permit files available to DEQ. Permit status is noted as active and in effect (A) or superseded (S).

Table 1 Permitting History

Issue Date	Permit Number	Project	Status	History Explanation
September 2, 1988	086-0031	Initial Permit for facility formerly named International Mill Services Inc.	S	Initial permit.
November 15, 1994	055-00031	Modification to add salt cake process and change furnace testing schedule.	S	Revised 086-0031.
February 3, 1995	055-00031	Amendment for correction.	S	Revised 055-00031 (11/15/94)
December 21, 1995	055-00031	Amendment.	S	Revised 055-00031 (2/3/95)
November 27, 1998	055-00031	Modification to replace RF3.	S	Revised 055-00031 (12/21/95)
February 14, 2000	055-00031	Revision to modify delacquering system and UBC pollution control system, to install delacquering system baghouse, and to increase RF3 heat input.	S	Revised 055-00031 (11/27/98)
April 10, 2001	055-00031	Revision to re-instate RF6 limits, remove testing requirements for formaldehyde, acetaldehyde, and Acrolein, and to increase HCl emissions.	S	Revised 055-00031 (2/14/00)
June 4, 2002	055-00031	Modification to increase fluoride emissions from rotary furnace.	S	Revised 055-00031 (4/10/01)
March 27, 2007	P-2007.0004	Modification to increase VOC emissions in RF6 and remove several emission units. Addition of 40 CFR 63, Subpart RR - NESHAP for Secondary Aluminum Production.	S	Revised 055-00031 (6/4/02)
April 25, 2007	P-2007.0004	Revision to update conditions 2.9 and fix typographical errors.	S	Revised P-2007.0004 (3/27/07)
December 31, 2009	P-2007.0050	Revision to revise frequency of source testing.	S	Revised P-2007.0004 (4/25/07)
May 28, 2010	P-2009.0139 PROJ 0140	Revision to change facility name.	S	Revised P-2007.0004 (12/31/09)
January 23, 2013	P-2009.0139 PROJ 61123	Revision to remove slat cake staging baghouse.	S	Revised P-2009.0139 (3/28/10)
May 6, 2015	P-2009.0139 PROJ 61440	Modification to add RF6, salt cake handling and crucible cleaning operations, and comply with consent decree requirements.	S	Revised P-2009.0139 (1/23/13)
December 6, 2019	P-2009.0139 PROJ 62290	Modification to increase allowable production for RF3 and RF6 based on recent performance testing and to eliminate restrictions on salt cake production.	A	Revised P-2009.0139 (3/6/15)

Application Scope

This PTC is for a minor modification at an existing minor facility. The applicant has proposed to:

- Increase allowable production for RF3 and RF 6 based on recent performance testing results.
- Eliminate restrictions on salt cake production.

Application Chronology

August 22, 2019	DEQ received an application and an application fee.
August 27 – Sept. 11, 2019	DEQ provided an opportunity to request a public comment period on the application and proposed permitting action.
September 20, 2019	DEQ determined that the application was complete.

November 4, 2019	DEQ made available the draft permit and statement of basis for peer and regional office review.
November 7, 2019	DEQ made available the draft permit and statement of basis for applicant review.
December 3, 2019	DEQ received the permit processing fee.
December 6, 2019	DEQ issued the final permit and statement of basis.

TECHNICAL ANALYSIS

Emissions Units and Control Equipment

Table 2 EMISSIONS UNIT AND CONTROL EQUIPMENT INFORMATION

Source ID No.	Sources	Control Equipment	Emission Point ID No.
RF3	Rotary Furnace #3 (RF3)	RF3 Baghouse (RFB3)	RFB3 Stack
RF6	Rotary Furnace #6 (RF6)	RF6 Baghouse (RFB6)	RFB6 Stack
SKSG 3	Salt Cake Staging and Handling for RF3	Baghouse #9 (BH9)	BH9 Stack
SKSG 6	Salt Cake Staging and Handling for RF6	Baghouse #8 (BH8)	BH8 Stack
	Crucible Cleaning	Baghouse #8 (BH8)	BH8 Stack
	Fugitive Emission Sources	Reasonable Controls	

Emissions Inventories

Potential to Emit

IDAPA 58.01.01 defines Potential to Emit as the maximum capacity of a facility or stationary source to emit an air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of the facility or source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is state or federally enforceable. Secondary emissions do not count in determining the potential to emit of a facility or stationary source.

Using this definition of Potential to Emit an emission inventory was developed for the two rotary furnaces and salt cake staging and handling operations at the facility (see Appendix A) associated with this proposed project. Project emission estimates were based on source testing at the facility. For RF3 (RF3), emissions of $PM_{10}/PM_{2.5}$ and HF are based on a source test performed on June 26, 2019, and emissions of Dioxin/Furan (D/F) are based on a source test performed on May 24, 2019. For RF6 (RF6), emissions of $PM_{10}/PM_{2.5}$ and HCl are based on a source test performed on November 10-11, 2015, emissions of Dioxin/Furan (D/F) are based on a source test performed on May 24, 2017, and emissions of HF are based on a source test performed on March 9, 2016. For both RF3 and RF6, NO_X emissions are based on an engineering test performed on November 29, 2018.

Note that the NO_X engineering test is not a sufficient basis for an emission unit PTE. A supplemental NO_X source test will be required to reinforce the results of the engineering test.

Pre-Project Potential to Emit

Pre-project Potential to Emit is used to establish the change in emissions at a facility as a result of this project.

The following table presents the pre-project potential to emit for all criteria pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 3 PRE-PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
RF3	1.74	7.60	0.02	0.07	3.66	16.03	6.88	30.11	0.38	1.64
RF6	1.16	5.07	0.02	0.07	2.44	10.68	4.58	20.08	0.25	1.10
Salt Cake Handling (for RF3)	0.01	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salk Cake Handling (for RF6)	0.02	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crucible Heater #1	0.01	0.05	0.001	0.004	0.15	0.64	0.12	0.54	0.01	0.04
Crucible Heater #2	0.01	0.05	0.001	0.004	0.15	0.64	0.12	0.54	0.01	0.04
Diesel Engine	0.02	0.09	0.02	0.08	0.28	1.22	0.06	0.27	0.02	0.10
Pre-Project Totals	**2.97**	**12.97**	**0.06**	**0.23**	**6.68**	**29.21**	**11.76**	**51.54**	**0.67**	**2.92**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Post Project Potential to Emit

Post project Potential to Emit is used to establish the change in emissions at a facility and to determine the facility's classification as a result of this project. Post project Potential to Emit includes all permit limits resulting from this project.

The following table presents the post project Potential to Emit for criteria pollutants from all emissions units affected by the proposed modifications as determined by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 4 POST PROJECT POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]	lb/hr[a]	T/yr[b]
RF3	0.41	1.81	0.02	0.07	2.99	13.11	7.70	33.73	0.44	1.92
RF6	0.78	3.41	0.02	0.09	2.99	13.11	5.50	24.09		
Salt Cake Handling (for RF3)	0.039	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Salk Cake Handling (for RF6)	0.027	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Crucible Heater #1	0.01	0.05	0.001	0.004	0.15	0.64	0.12	0.54	0.01	0.04
Crucible Heater #2	0.01	0.05	0.001	0.004	0.15	0.64	0.12	0.54	0.01	0.04
Diesel Engine	0.02	0.09	0.02	0.08	0.28	1.22	0.06	0.27	0.02	0.10
Post Project Totals	**1.30**	**5.70**	**0.06**	**0.25**	**6.56**	**28.72**	**13.50**	**59.17**	**0.48**	**2.10**

a) Controlled average emission rate in pounds per hour is a daily average, based on the proposed daily operating schedule and daily limits.
b) Controlled average emission rate in tons per year is an annual average, based on the proposed annual operating schedule and annual limits.

Change in Potential to Emit

The change in facility-wide potential to emit is used to determine if a public comment period may be required and to determine the processing fee per IDAPA 58.01.01.225. The following table presents the facility-wide change in the potential to emit for criteria pollutants.

Table 5 CHANGES IN POTENTIAL TO EMIT FOR REGULATED AIR POLLUTANTS

Source	$PM_{10}/PM_{2.5}$		SO_2		NO_X		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Pre-Project Potential to Emit	2.97	12.97	0.06	0.23	6.68	29.21	11.76	51.54	0.67	2.92
Post Project Potential to Emit	1.30	5.70	0.06	0.25	6.56	28.72	13.50	59.17	0.48	2.10
Changes in Potential to Emit	**-1.67**	**-7.27**	**0.00**	**0.02**	**-0.12**	**-0.49**	**1.74**	**7.63**	**-0.19**	**-0.82**

Non-Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of non-carcinogenic toxic air pollutants (TAP) is provided in the following table.

Pre- and post-project, as well as the change in, non-carcinogenic TAP emissions are presented in the following table:

Table 6 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR NON-CARCINOGENIC TOXIC AIR POLLUTANTS

Non-Carcinogenic Toxic Air Pollutants	Pre-Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Post Project 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Change in 24-hour Average Emissions Rates for Units at the Facility (lb/hr)	Non-Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
3-Methylchloranthrene	1.01E-07	1.01E-07	0.0000	2.50E-06	N
Acrolein	3.80E-04	3.80E-04	0.0000	1.70E-02	N
Cobalt	4.69E-06	4.69E-06	0.0000	3.30E-03	N
Copper	4.75E-05	4.75E-05	0.0000	1.30E-02	N
HCl	2.15E+00	1.68E+00	-0.4700	5.00E-02	N
Hexane	1.01E-01	1.01E-01	0.0000	1.20E+01	N
HF	3.60E-01	5.66E-02	-0.3034	1.67E-01	N
Manganese	2.12E-05	2.12E-05	0.0000	6.67E-02	N
Molybdenum	6.15E-05	6.15E-05	0.0000	3.33E-01	N
Naphthalene	3.83E-04	3.83E-04	0.0000	3.33E+01	N
Selenium	1.34E-06	1.34E-06	0.0000	1.30E-02	N
Toluene	1.87E-03	1.87E-03	0.0000	2.50E+01	N
Vanadium	1.29E-04	1.29E-04	0.0000	3.00E-03	N
Xylene	1.17E-03	1.17E-03	0.0000	2.90E+01	N
Zinc	1.62E-03	1.62E-03	0.0000	6.67E-01	N

All changes in emissions rates for non-carcinogenic TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any non-carcinogenic TAP because none of the 24-hour average non-carcinogenic screening ELs identified in IDAPA 58.01.01.585 were exceeded.

Carcinogenic TAP Emissions

A summary of the estimated PTE for emissions increase of carcinogenic toxic air pollutants (TAP) is provided in the following table.

Table 7 PRE- AND POST PROJECT POTENTIAL TO EMIT FOR CARCINOGENIC TOXIC AIR POLLUTANTS

Carcinogenic Toxic Air Pollutants	Pre-Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Post Project Annual Average Emissions Rates for Units at the Facility (lb/hr)	Change in Annual Average Emissions Rates for Units at the Facility (lb/hr)	Carcinogenic Screening Emission Level (lb/hr)	Exceeds Screening Level? (Y/N)
Acetaldehyde	3.15E-03	3.15E-03	0.0000	3.00E-03	N
Benzene	3.95E-03	3.95E-03	0.0000	8.00E-04	N
1,2-Butadiene	1.61E-04	1.61E-04	0.0000	2.40E-05	N
Formaldehyde	9.04E-03	9.04E-03	0.0000	5.10E-04	N
7-PAH1	6.37E-07	6.37E-07	0.0000	2.00E-06	N
Arsenic	1.12E-05	1.12E-05	0.0000	1.50E-06	N
Beryllium	6.71E-07	6.71E-07	0.0000	2.80E-05	N
Cadmium	6.15E-05	6.15E-05	0.0000	3.70E-06	N
Chromium	7.82E-05	7.82E-05	0.0000	3.30E-02	N
Nickel	1.17E-04	1.17E-04	0.0000	2.70E-05	N
2,3,7,8-TCDD2	2.85E-07	1.88E-08	-0.00000027	1.50E-10	N

a) Polycyclic Organic Matter (POM) is considered as one TAP comprised of: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, dibenzo(a,h)anthracene, chrysene, indeno(1,2,3-cd)pyrene, benzo(a)pyrene. The total is compared to benzo(a)pyrene.

All changes in emissions rates for carcinogenic TAP were below EL (screening emissions level) as a result of this project. Therefore, modeling is not required for any carcinogenic TAP because none of the annual average carcinogenic screening ELs identified in IDAPA 58.01.01.586 were exceeded.

Post Project HAP Emissions

The following table presents the post project potential to emit for HAP pollutants from all emissions units at the facility as submitted by the Applicant and verified by DEQ staff. See Appendix A for a detailed presentation of the calculations of these emissions for each emissions unit.

Table 8 HAZARDOUS AIR POLLUTANTS EMISSIONS POTENTIAL TO EMIT SUMMARY

Hazardous Air Pollutants	PTE (lb/hr)	PTE (T/yr)
Acrolein	3.80E-04	1.66E-03
Cobalt	4.69E-06	2.06E-05
Hexane	1.01E-01	4.41E-01
HF	6.23E-02	2.73E-01
HCl	1.69E+00	7.40E+00
Manganese	2.12E-05	9.30E-05
Naphthalene	3.83E-04	1.68E-03
Toluene	1.34E-06	5.87E-06
Xylene	1.87E-03	8.19E-03
1,2-Butadiene	1.17E-03	5.12E-03
2,3,7,8-TCDD	1.61E-04	7.05E-04
Acetaldehyde	2.23E-08	9.78E-08
Arsenic	3.15E-03	1.38E-02
Benzene	1.12E-05	4.90E-05
Beryllium	3.95E-03	1.73E-02
Cadmium	6.71E-07	2.94E-06
Chromium	6.15E-05	2.69E-04
Formaldehyde	7.82E-05	3.43E-04
Nickel	9.04E-03	3.96E-02
POM[a]	1.17E-04	5.14E-04
Total	6.37E-07	2.79E-06
Totals	**1.87**	**8.20**

Ambient Air Quality Impact Analyses

As presented in the Modeling Memo in Appendix B, the estimated emission rates of all TAP were below applicable screening emission levels (EL), the estimated facility-wide emission rates of SO_2 and Lead were below regulatory concern, and the estimated change in emission rate for CO was below the published DEQ modelling threshold established in IDAPA 58.01.01.585-586 and in the State of Idaho Air Quality Modeling Guideline[1]. Refer to the Emissions Inventories section for additional information concerning the emission inventories.

The applicant has demonstrated pre-construction compliance to DEQ's satisfaction that emissions from this facility will not cause or significantly contribute to a violation of any ambient air quality standard. The applicant has also demonstrated pre-construction compliance to DEQ's satisfaction that the emissions increase due to this permitting action will not exceed any acceptable ambient concentration (AAC) or acceptable ambient concentration for carcinogens (AACC) for toxic air pollutants (TAP). A summary of the Ambient Air Impact Analysis for TAP is provided in Appendix A.

An ambient air quality impact analyses document has been crafted by DEQ based on a review of the modeling analysis submitted in the application. That document is part of the final permit package for this permitting action (see Appendix B).

REGULATORY ANALYSIS

Attainment Designation (40 CFR 81.313)

The facility is located in Kootenai County, which is designated as attainment or unclassifiable for $PM_{2.5}$, PM_{10}, SO_2, NO_2, CO, and Ozone. Refer to 40 CFR 81.313 for additional information.

Facility Classification

The AIRS/AFS facility classification codes are as follows:

For HAPs (Hazardous Air Pollutants) Only:

A = Use when any one HAP has permitted emissions > 10 T/yr or if the aggregate of all HAPS (Total

HAPs) has permitted emissions > 25 T/yr.

SM80 = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits > 8 T/yr of a single HAP or ≥ 20 T/yr of Total HAPs.

SM = Use if a synthetic minor (uncontrolled HAPs emissions are > 10 T/yr or if the aggregate of all uncontrolled HAPs (Total HAPs) emissions are > 25 T/yr and permitted emissions fall below applicable major source thresholds) and the permit sets limits < 8 T/yr of a single HAP and/or < 20 T/yr of Total HAPs.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 10 and 25 T/yr HAP major source thresholds.

UNK = Class is unknown.

For All Other Pollutants:

A = Use when permitted emissions of a pollutant are > 100 T/yr.

SM80 = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are ≥ 80 T/yr.

SM = Use if a synthetic minor for the applicable pollutant (uncontrolled emissions are > 100 T/yr and permitted emissions fall below 100 T/yr) and permitted emissions of the pollutant are < 80 T/yr.

B = Use when the potential to emit (i.e. uncontrolled emissions and permitted emissions) are below the 100 T/yr major source threshold.

UNK = Class is unknown.

Table 9 REGULATED AIR POLLUTANT FACILITY CLASSIFICATION

Pollutant	Uncontrolled PTE (T/yr)	Permitted PTE (T/yr)	Major Source Thresholds (T/yr)	AIRS/AFS Classification
PM	2,588	52.52	**100**	SM
PM_{10}	316.2	5.70	**100**	SM
$PM_{2.5}$	316.2	5.70	**100**	SM
SO_2	0.25	0.25	**100**	B
NO_X	28.72	28.72	**100**	B
CO	59.17	59.17	**100**	B
VOC	2.10	2.10	**100**	B
HAP (single)	>10	7.4	**10**	SM
Total HAPs	>25	8.20	**25**	SM

Permit to Construct (IDAPA 58.01.01.201)

IDAPA 58.01.01.201.. Permit to Construct Required

The permittee has requested that a PTC be issued to the facility for the increase in allowable production and elimination of salt cake production limits. Therefore, a permit to construct is required to be issued in accordance with IDAPA 58.01.01.220. This permitting action was processed in accordance with the procedures of IDAPA 58.01.01.200-228.

Tier II Operating Permit (IDAPA 58.01.01.401)

IDAPA 58.01.01.401.. Tier II Operating Permit

The application was submitted for a permit to construct (refer to the Permit to Construct section), and an optional Tier II operating permit has not been requested. Therefore, the procedures of IDAPA 58.01.01.400–410 were not applicable to this permitting action.

Visible Emissions (IDAPA 58.01.01.625)

IDAPA 58.01.01.625 .... Visible Emissions

The sources of PM emissions at this facility are subject to the State of Idaho visible emissions standard of 20% opacity. This requirement is assured by the Opacity Limit Permit Condition (2.6).

Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

IDAPA 58.01.01.301 .... Requirement to Obtain Tier I Operating Permit

Post project facility-wide emissions from this facility do not have a potential to emit greater than 100 tons per year for any criteria pollutant or 10 tons per year for any one HAP or 25 tons per year for all HAP combined as demonstrated previously in the Emissions Inventories Section of this analysis. Therefore, the facility is not a Tier I source in accordance with IDAPA 58.01.01.006 and the requirements of IDAPA 58.01.01.301 do not apply.

PSD Classification (40 CFR 52.21)

40 CFR 52.21 .... Prevention of Significant Deterioration of Air Quality

The facility is not a major stationary source as defined in 40 CFR 52.21(b)(1), nor is it undergoing any physical change at a stationary source not otherwise qualifying under paragraph 40 CFR 52.21(b)(1) as a major stationary source, that would constitute a major stationary source by itself as defined in 40 CFR 52. Therefore in accordance with 40 CFR 52.21(a)(2), PSD requirements are not applicable to this permitting action. The facility is not a designated facility as defined in 40 CFR 52.21(b)(1)(i)(a), and does not have facility-wide emissions of any criteria pollutant that exceed 250 T/yr.

NSPS Applicability (40 CFR 60)

The facility is not subject to any NSPS requirements in 40 CFR Part 60, and this permitting action does not alter the applicability status of existing affected sources at the facility.

NESHAP Applicability (40 CFR 61)

The proposed source is not an affected source subject to NESHAP in 40 CFR 61, and this permitting action does not alter the applicability status of existing affected sources at the facility.

MACT/GACT Applicability (40 CFR 63)

The facility has proposed to operate as a minor source of hazardous air pollutant (HAP) emissions, and is subject to the requirements of 40 CFR 63, Subpart RRR–National Emission Standards for Hazardous Air Pollutants for Secondary Aluminum Production. DEQ is delegated this Subpart. Refer to the Statement of Basis issued on May 6, 2015 for a breakdown of the requirements of this subpart.

Permit Conditions Review

This section describes only those permit conditions that have been added, revised, modified or deleted as a result of this permitting action.

Section 1

Section 1 was updated to reflect the current permitting action.

Permit Condition 2.5

Feed charge limits were increased from 150 lb/hr and 54,750 T/yr to 175 lb/hr and 63,875 T/yr for RF3 and from 100 lb/hr and 36,500 T/yr to 125 lb/hr and 45,630 T/yr for RF 6.

Permit Condition 2.8

Because salt cake production rate limitations were eliminated by this permitting action, permit condition 2.8 was modified to require that particulate emissions from the salt cake staging and handling areas be controlled by baghouses with 98% minimum control efficiency for PM_{10}. This ensures that the emission of PM by the salt cake staging and handling areas does not exceed its permitted limit.

Existing Permit Condition 2.9

Existing permit condition 2.9 was removed.

Permit Condition 2.11

This permit condition was revised to fix a typographical error ('lg' was changed to 'lb').

Permit Condition 2.12

Existing Permit Condition 2.13 (Salt Cake Production Rate Tracking) of PTC No. P-2009.0139 issued May 6, 2015 was deleted in response to the removal of salt cake production limits.

Permit Condition 2.16

New Permit Condition 2.17 was added to require a source test for NO_X to reinforce the results of the engineering test which forms the basis of the NO_X PTE for RF3 and FR6.

Permit Condition 2.17

The source test deadline for PM_{10} was updated from June 26, 2019 to July 15, 2024 for RF3. A source test deadline of June 15, 2021 for RF6 was included.

Permit Condition 2.18

The source test deadline for particulate fluoride was updated from June 26, 2019 to July 15, 2024 for RF3. A source test deadline of June 15, 2021 for RF6 was included.

Permit Condition 2.21

Permit condition 2.22 was modified to fix a typographical error under the paragraph titled *Notification of compliance status report.* In addition, this paragraph required dual notification to the EPA regarding the notification of compliance, however because DEQ has been delegated authority for 40 CFR 63, Subpart RRR, dual notification is not required. Therefore, permit condition 2.22 was further modified to require only notification to DEQ.

Existing Permit Condition 2.22

Existing permit condition 2.22 was removed because it was redundant with permit condition 2.14 (Incorporation of Federal Requirements by Reference)

PUBLIC REVIEW

Public Comment Opportunity

An opportunity for public comment period on the application was provided in accordance with IDAPA 58.01.01.209.01.c or IDAPA 58.01.01.404.01.c. During this time, there was not a request for a public comment period on DEQ's proposed action. Refer to the chronology for public comment opportunity dates.

APPENDIX A – EMISSIONS INVENTORIES

RF #3

Material Throughput (ton/yr): 63,875

Burner Rated Capacity (MMBtu/hr): 27

Pollutant	Emission Factor					Safety Factor	Emissions		
	Existing EF		EF from Source Testing						
	(lb/T)	(lb/MMBtu)	Emission Rate (lb/hr)	Throughput (lb/hr)	Calculated EF (lb/T)		lb/hr	T/yr	
NOX	-	-	1.33	-	-	2.25	2.99	13.11	<-- Based on engineering test. Require subsequent source test to verify.
CO	0.88	-				1.20	7.70	33.73	
SO2	-	0.000588				1	0.02	0.07	
PM	0.763	-				1.25	6.95	30.46	
PM10	-	-	0.33	11,672	0.057	1	0.41	1.81	<-- Source test on 6/26/2019
PM2.5	-	-	0.33	11,672	0.057	1	0.41	1.81	<-- Source test on 6/26/2019
VOC	0.048	-				1.25	0.44	1.92	
Dioxin/Furan		-		12,116				0.00	<-- Source test on 5/24/2019 (TEST CONDUCTED ON RF6)
HCl	0.181	-				1.25	1.65	7.23	
HF	-	-	0.029	11,672	0.005	1	0.04	0.16	<-- Source test on 6/26/2019

RF #6

Material Throughput (ton/yr): 45,630

Burner Rated Capacity (MMBtu/hr): 27

Pollutant	Emission Factor					Safety Factor	Emissions		
	Existing EF		EF from Source Testing						
	(lb/T)	(lb/MMBtu)	Emission Rate (lb/hr)	Throughput (lb/hr)	Calculated EF (lb/T)		lb/hr	T/yr	
NOX	-	-	1.33	-	-	2.25	2.99	13.11	<-- Based on engineering test. Require subsequent source test to verify.
CO	0.88	-				1.20	5.50	24.09	
SO2	-	0.000588				1.25	0.02	0.09	
PM	0.763	-				1.25	4.97	21.76	
PM10	-	-	1.04	13,935	0.149	1	0.78	3.41	<-- Source test on 11/10-11/2015
PM2.5	-	-	1.04	13,935	0.149	1	0.78	3.41	<-- Source test on 11/10-11/2015
VOC	0.048	-				1.25	0.31	1.37	
Dioxin/Furan		-		12,116				0.00	<-- Source test on 5/24/2017
HCl	0.181	-	0.042	13,303	0.006	1	0.94	4.13	<-- Source test on 11/10-11/2015
HF	-	-	0.021	10,720	0.004	1	0.02	0.09	<-- Source Test on 03/09/2016. Note, source test on 11/10/2015 showed much

	SKSG #3	SKSG #6
Charge to Furnace (T/yr)	63,875	45,625
Aluminum Recovery Rate	50%	50%
Aluminum Recovered (T/yr)	31,938	22,813
Salt to Charge Ratio	0.25	0.2
Salt Usage (T/yr)	15,969	9,125
Salt Cake Produced (T/yr)	47,906	31,938
Airborne PM Generated (T/yr)	17.64	11.76
Fume Hood Capture Efficiency	0.98	0.98
Baghouse Control Efficiency	0.99	0.99
PM Emissions (T/yr)	0.17	0.12
Fugitive Emissions (T/yr)	0.35	0.24
	17.64	11.76

		RF #3	RF #6	CH	Gen	Total
		0.026470588	0.0264706	0.0029412		
3-Methylchloranthrene	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
7,12-Dimethylbenz(a)anthracene	<1.60E-05	4.24E-07	4.24E-07	4.71E-08		8.94E-07
Acetaldehyde		0.00E+00	0.00E+00	0.00E+00	3.15E-03	3.15E-03
Acrolein		0.00E+00	0.00E+00	0.00E+00	3.80E-04	3.80E-04
Acenaphthene	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Acenaphthylene	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Anthracene	<2.40E-06	6.35E-08	6.35E-08	7.06E-09		1.34E-07
Benz(a)anthracene[3]	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Benzene	2.10E-03	5.56E-05	5.56E-05	6.18E-06	3.83E-03	3.95E-03
Benzo(a)pyrene[3]	<1.20E-06	3.18E-08	3.18E-08	3.53E-09		6.71E-08
Benzo(b)fluoranthene[3]	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Benzo(g,h,i)perylene	<1.20E-06	3.18E-08	3.18E-08	3.53E-09		6.71E-08
Benzo(k)fluoranthene[3]	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
1,2-Butadiene		0.00E+00	0.00E+00	0.00E+00	1.61E-04	1.61E-04
Chrysene[3]	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Dibenzo(a,h)anthracene[3]	<1.20E-06	3.18E-08	3.18E-08	3.53E-09		6.71E-08
Dichlorobenzene	1.20E-03	3.18E-05	3.18E-05	3.53E-06		6.71E-05
Fluoranthene	3.00E-06	7.94E-08	7.94E-08	8.82E-09		1.68E-07
Fluorene	2.80E-06	7.41E-08	7.41E-08	8.24E-09		1.56E-07
Formaldehyde	7.50E-02	1.99E-03	1.99E-03	2.21E-04	4.85E-03	9.04E-03
Hexane	1.80E+00	4.76E-02	4.76E-02	5.29E-03		1.01E-01
Indeno(1,2,3-cd)pyrene[3]	<1.80E-06	4.76E-08	4.76E-08	5.29E-09		1.01E-07
Naphthalene	6.10E-04	1.61E-05	1.61E-05	1.79E-06	3.49E-04	3.83E-04
Phenanathrene	1.70E-05	4.50E-07	4.50E-07	5.00E-08		9.50E-07
Pyrene	5.00E-06	1.32E-07	1.32E-07	1.47E-08		2.79E-07
Toluene	3.40E-03	9.00E-05	9.00E-05	1.00E-05	1.68E-03	1.87E-03
Xylene		0.00E+00	0.00E+00	0.00E+00	1.17E-03	1.17E-03
7-PAH		3.02E-07	3.02E-07	3.35E-08		6.37E-07
Arsenic	2.00E-04	5.29E-06	5.29E-06	5.88E-07		1.12E-05
Beryllium	<1.20E-05	3.18E-07	3.18E-07	3.53E-08		6.71E-07
Cadmium	1.10E-03	2.91E-05	2.91E-05	3.24E-06		6.15E-05
Chromium	1.40E-03	3.71E-05	3.71E-05	4.12E-06		7.82E-05
Cobalt	8.40E-05	2.22E-06	2.22E-06	2.47E-07		4.69E-06
Copper	8.50E-04	2.25E-05	2.25E-05	2.50E-06		4.75E-05
Manganese	3.80E-04	1.01E-05	1.01E-05	1.12E-06		2.12E-05
Mercury	2.60E-04	6.88E-06	6.88E-06	7.65E-07		1.45E-05
Molybdenum	1.10E-03	2.91E-05	2.91E-05	3.24E-06		6.15E-05
Nickel	2.10E-03	5.56E-05	5.56E-05	6.18E-06		1.17E-04
Selenium	<2.40E-05	6.35E-07	6.35E-07	7.06E-08		1.34E-06
Vanadium	<2.30E-03	6.09E-05	6.09E-05	6.76E-06		1.29E-04
Zinc	<2.90E-02	7.68E-04	7.68E-04	8.53E-05		1.62E-03
HF		3.62E-02	2.04E-02	0.00E+00		5.66E-02
HCl		1.65E+00	9.43E-01	0.00E+00		2.59E+00
2,3,7,8-TCDD		0.00E+00	0.00E+00	0.00E+00		0.00E+00

APPENDIX B – AMBIENT AIR QUALITY IMPACT ANALYSES

MEMORANDUM

DATE: October 30, 2019

TO: Chris Duerschner, Permit Writer, Air Program

FROM: Darrin Mehr, Dispersion Modeling Analyst, Air Program

PROJECT: P-2009.0139 PROJ 62290 – Permit to Construct (PTC) Application for the Real Alloy, LLC for Increased Throughputs for Rotary Kilns #3 and #6 Modification for the Existing Facility near Post Falls, Idaho

SUBJECT: Demonstration of Compliance with IDAPA 58.01.01.203.02 (NAAQS) and 203.03 (TAPs)

Contents

Acronyms, Units, and Chemical Nomenclature

AAC	Acceptable Ambient Concentration of a Non-Carcinogenic TAP
AACC	Acceptable Ambient Concentration of a Carcinogenic TAP
ACFM	Actual cubic feet per minute
AERMAP	The terrain data preprocessor for AERMOD
AERMET	The meteorological data preprocessor for AERMOD
AERMOD	American Meteorological Society/Environmental Protection Agency Regulatory Model
Appendix W	40 CFR 51, Appendix W – Guideline on Air Quality Models
ARM	Ambient Ratio Method
bhp	Brake horsepower
BPIP	Building Profile Input Program
BRC	Below Regulatory Concern
Btu/hr	British Thermal Units per hour
CFR	Code of Federal Regulations
cfm	Cubic Feet per Minute
CMAQ	Community Multi-Scale Air Quality Modeling System
CO	Carbon Monoxide
DEQ	Idaho Department of Environmental Quality
EI	Emissions Inventory
EL	Emissions Screening Level of a TAP
EPA	United States Environmental Protection Agency
fps	Feet per second
GEP	Good Engineering Practice
hr	Hours
Idaho Air Rules	Rules for the Control of Air Pollution in Idaho, located in the Idaho Administrative Procedures Act 58.01.01
ISCST3	Industrial Source Complex Short Term 3 dispersion model
K	Kelvin
kW	Kilowatts
m	Meters
MACT	Maximum Achievable Control Technology
m/s	Meters per second
MMBtu	Million British Thermal Units
NAAQS	National Ambient Air Quality Standards
NED	National Elevation Dataset
NO	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NO_x	Oxides of Nitrogen
NEI	National Emissions Inventory
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS	New Source Performance Standard
NWS	National Weather Service
NW AIRQUEST	Northwest International Air Quality Environmental Science and Technology Consortium
O_3	Ozone
Pb	Lead

PM_{10}	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 10 micrometers
$PM_{2.5}$	Particulate matter with an aerodynamic particle diameter less than or equal to a nominal 2.5 micrometers
ppb	Parts Per Billion
PRIME	Plume Rise Model Enhancement
PTC	Permit to Construct
PTE	Potential to Emit
Real Alloy	Real Alloy Recycling, LLC (permittee)
RF#3	Rotary Furnace #3
RF#6	Rotary Furnace #6
SIL	Significant Impact Level
SO_2	Sulfur Dioxide
SOB	Statement of Basis
TAP	Toxic Air Pollutant
tons/year	Ton(s) per year
T/yr	Tons per year
Trinity	Trinity Consultants (project permitting consultant)
ULSD	Ultra Low Sulfur Diesel
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOCs	Volatile Organic Compounds
°F	Degrees Fahrenheit
$\mu g/m^3$	Micrograms per cubic meter of air

1.0 Summary

1.1 General Project Summary

On August 22, 2019, Real Alloy Recycling, LLC (Real Alloy) submitted a Permit to Construct (PTC) application to change existing permit conditions for their existing facility located at 16168 West Prairie Avenue near Post Falls, Idaho.

Real Alloy was issued PTC P-2009.0139 Project 62075, on June 12, 2018, for the facility name change of the facility from Real Alloy Recycling, Inc., to Real Alloy Recycling, LLC. This PTC superseded PTC P-2009.0139 Project 61440, issued May 6, 2015, which created underlying conditions for emission units, including emission and product throughput limits affected by the current project. The current project includes:

- Rotary Furnace #3 (RF#3) current permitted throughput capacity of 150 tons/day, monthly average basis, and 54,750 tons/year will be increased to 175 tons/day and 63,875 tons/year.
- Rotary Furnace (RF#6) current permitted throughput capacity of 100 tons/day, monthly average basis, and 36,500 tons/year will be increased to 125 tons/day and 45,630 tons/year.
- The current permitted RF#3 by-product salt cake production is limited to 4,108 pounds/hour on a monthly average basis, and 17,995 tons/year. This limit was requested to be removed from the PTC, and the PTC modification application reflected salt cake production rates of 11,089 pounds/hour and 47,906 tons/year.
- The current permitted by-product salt cake throughputs for RF#6 are currently limited to 2,628 pounds/hour on a monthly average basis, and 11,516 tons/year. This limit was requested to be removed from the PTC, and the PTC modification application reflected salt cake production rates of 7,393 pounds/hour and 31,938 tons/year.

Due to the relaxation of permit-allowable throughput limitations and changes to the requested potential emissions rates, without a physical change or change in the method of operation, the project is effectively a revision of the previous project. The revision is analyzed using the current version of AERMOD, updated meteorological dataset determined to be most appropriate for the facility site, updated DEQ-approved ambient background concentrations, and requested future permit allowable emission rates. DEQ performed the air impact analyses for this project because there were no physical changes to the facility and DEQ had modeling files readily available from previous permitting analyses for the facility.

Project-specific air quality impact analyses involving atmospheric dispersion modeling of estimated emissions associated with the entire facility were performed by DEQ to demonstrate that the proposed modification's post-project potential emissions would not cause or significantly contribute to a violation of any ambient air quality standard as required by IDAPA 58.01.01.203.02 and 203.03 (Idaho Air Rules Section 203.02 and 203.03).

The DEQ review summarized by this memorandum addressed only the rules, policies, methods, and data pertaining to the pollutant dispersion modeling analyses used to demonstrate that the estimated emissions associated with operation of the facility will not cause or significantly contribute to a violation of the applicable air quality standards. This review did not evaluate compliance with other rules or analyses that do not pertain to the air impact analyses. This modeling review also did not evaluate the accuracy of emissions estimates. Evaluation of emissions estimates was the responsibility of the permit writer and is addressed in the main body of the DEQ Statement of Basis.

The air quality impact analyses: 1) utilized appropriate methods and models according to established DEQ/EPA rules, policies, guidance, and procedures; 2) was conducted using reasonably accurate or conservative model parameters and input data (review of emissions estimates was addressed by the DEQ permit writer); 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the facility as modeled were below Significant Impact Levels (SILs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from applicable emissions associated with the project as modeled, when appropriately combined with co-contributing sources and background concentrations, were below applicable National Ambient Air Quality Standards (NAAQS) at ambient air locations where and when the project has a significant impact; 5) showed that Toxic Air Pollutant (TAP) emissions increases associated with the project do not result in increased emissions and modeling was not required to demonstrate compliance with any TAPs increments. Table 1 presents key assumptions and results to be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
Criteria/Assumption/Result	**Explanation/Consideration**
Process Throughputs This project's modeled emission rates reflected altered emission factors that estimated lower emission rates for a given process throughput for the two rotary furnaces (RF). The lower emission factors were combined with requests for 25 tons/hour increases of permit-allowable process throughputs for each of the two rotary furnaces (RF#3 and RF#6). Requested daily emission rate limits were modeled. Worst-case daily emissions are required to be modeled for compliance with the 24-hour average NAAQS. **Emissions were modeled for the following process throughputs:** • RF#3: 175 tons/day and 63,875 tons/year • RF#6: 125 tons/day and 45,630 tons/year • RF#3 by-product salt cake generation: 11,089 pounds/hour and 47,906 tons/year • RF#6 by-product salt cake generation: 7,393 pounds/hour and 31,938 tons/year.	DEQ modeled the requested daily emissions for the 24-hour PM_{10} and $PM_{2.5}$ NAAQS. NAAQS compliance demonstrations are required to be based on the maximum requested quantity of emissions over the averaging period. Throughputs above the requested daily limits were not modeled for this project, and emissions modeled must be the maximum allowed by the permit for the averaging period of the NAAQS. Additional capacity should be incorporated in the permit application for operational flexibility. Daily production or throughputs averaged over a monthly period do not confirm that the worst-case daily emission rates were represented in the NAAQS compliance demonstration. Compliance with 24-hour NAAQS are only assured by permit limits that are a 24-hour maximum. Additional production flexibility could be accommodated by using higher requested permit-allowable daily process throughputs for RF#3 and RF#6, followed by revision of 24-hour averaged air impact analyses. Annual process throughputs may remain unchanged.
Process Change on Salt Cake Cooling A dedicated by-product salt cake cooler unit is no longer used by Real Alloy. The unaided cooling of salt cake by-product still occurs inside the furnace building and 98% capture of emissions via a hood system was assumed. The captured emissions are controlled by routing the emissions to the existing salt cake handling baghouses (model IDs STCK9_RF3SCH and STCK8_RF6SCH).	Salt cake cooling does not occur outside of the building. No new process fugitive sources must be accounted for in the air impact analyses. The increase in the process material throughput was accounted for in the $PM_{2.5}$ and PM_{10} emission estimates for the salt cake handling baghouses and the fugitive $PM_{2.5}$ and PM_{10} emissions rates for the existing sources were increased accordingly.
Diesel-Fired Firewater Pump Engine DEQ modeled the firewater pump for three cases: 1) unlimited 24 hours/day; 2) 6 hours/day as a reasonable worst-case scenario; and 3) 1.36 hours /day as represented in the historical 2015 permit project modeling analyses and emission inventory (EI) for testing and maintenance.	The emergency firewater pump engine is not specifically included in the current PTC on the basis that it was exempt from permitting requirements per the Statement of Basis (SOB) for PTC P-2009.0139 Project 61440, issued May 6, 2015. This project's ambient air impact analysis produced impacts indicating that facility-wide NAAQS compliance is demonstrated assuming unlimited daily operating hours at full

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES	
	load capacity of this emission unit for the most constraining pollutant and averaging period—24-hour average $PM_{2.5}$. A limitation for daily hours of testing and maintenance operation is not necessary for this emergency engine from a NAAQS protection standpoint.

Air impact analyses are required by Idaho Air Rules to be conducted according to methods outlined in 40 CFR 51, Appendix W (*Guideline on Air Quality Models*). Appendix W requires that facilities be modeled using emissions and operations representative of design capacity or as limited by a federally enforceable permit condition. The submitted information and analyses demonstrated to the satisfaction of the Department, using DEQ/EPA established guidance, policies, and procedures, that operation of the proposed facility or modification will not cause or significantly contribute to a violation of any ambient air quality standard, provided the key conditions in Table 1 are representative of facility design capacity or operations as limited by a federally enforceable permit condition.

1.2 Summary of Submittals and Actions

August 12, 2019: Representatives of Real Alloy and DEQ participated in a pre-application meeting via telephone conference call.

August 22, 2019: Real Alloy submitted a permit application for the modification project.

August 23, 2019: The regulatory start date for completeness review commenced.

September 20, 2019: DEQ declared the permit application incomplete.

September 30, 2019: Trinity submitted additional clarification of the requested changes to the salt cake handling process and the emissions inventory via an email submittal, which included the following:

- Real Alloy and Trinity stated there are no additional sources of process fugitives created with the discontinued use of the salt cake coolers process units.
- The current salt cake cooling process still occurs within the furnace building. This means all natural cooling fugitive emissions were treated with a 98% capture efficiency.
- Trinity and Real Alloy stated that the submitted emissions inventory contains the worst-case maximum emissions for the salt cake handling process in support of this project's request to remove of all throughput limitations associated with salt cake handling from the PTC.

2.0 Background Information

2.1 Permit Requirements for Permits to Construct

PTCs are issued to authorize the construction of a new source or modification of an existing source or permit. Idaho Air Rules Section 203.02 requires that emissions from the new source or modification not cause or significantly contribute to a violation of an air quality standard, and Idaho Air Rules Section 203.03 requires that emissions from a new source or modification comply with applicable toxic air pollutant (TAP) increments of Idaho Air Rules Sections 585 and 586.

2.2 Project Location and Area Classification

The facility is located near Post Falls, Idaho, in Kootenai County. This area is designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}), and particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers ($PM_{2.5}$).

2.3 Modeling Applicability for Criteria Pollutants

2.3.1 Below Regulatory Concern, DEQ Modeling Thresholds, and Project Definition

Idaho Air Rules Section 203.02 state that a PTC cannot be issued unless the application demonstrates to the satisfaction of DEQ that the new source or modification will not cause or significantly contribute to a NAAQS violation. Atmospheric dispersion modeling is used to evaluate the potential impact of a proposed project to ambient air and demonstrate NAAQS compliance. However, if the emissions associated with a project are very small, project-specific modeling analyses may not be necessary.

If project-wide potential to emit (PTE) values for criteria pollutants would qualify for a below regulatory concern (BRC) permit exemption as per Idaho Air Rules Section 221 if it were not for potential emissions of one or more criteria pollutants exceeding the BRC threshold of 10% of emissions defined by Idaho Air Rules as significant, then an air impact analysis may not be required for those pollutants. DEQ's regulatory interpretation policy[1] of exemption provisions of Idaho Air Rules Section 221 is that: "A DEQ NAAQS compliance assertion will not be made by the DEQ modeling group for specific criteria pollutants having a project emissions increase below BRC levels, provided the proposed project would have qualified for a Category I Exemption for BRC emissions quantities except for the emissions of another criteria pollutant." The interpretation policy also states that the exemption criteria of uncontrolled PTE not to exceed 100 ton/year (Idaho Air Rules Section 220.01.a.i) is not applicable when evaluating whether a NAAQS impact analyses is required. A permit will be issued limiting PTE below 100 ton/year, thereby negating the need to maintain calculated uncontrolled PTE under 100 ton/year. BRC is based only on annual emissions, but the BRC exemption from the requirements of Idaho Air Rules Section 203.02 applies to all averaging periods of that specific pollutant. Air impact analyses for SO_2 and lead were not necessary for permit issuance because post-project facility-wide non-fugitive emissions of those pollutants are below BRC levels. This permitting project does not qualify for a BRC exemption from Idaho Air Rules Section 203.02 for PM_{10}, $PM_{2.5}$, CO, and NO_2 because there are existing permit conditions that require changes to throughput and emission limitations.

Site-specific air impact analyses may not be required for a project, even when the project cannot use the BRC exemption from the NAAQS demonstration requirements. If the emission increases associated with a project are below modeling applicability thresholds established in the *Idaho Air Modeling Guideline* ("State of Idaho Guideline for Performing Air Quality Impact Analyses[2]," available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf), then a project-specific analysis is not required. Modeling applicability emissions thresholds were developed by DEQ based on modeling of a hypothetical source and were designed to reasonably ensure that impacts are below the applicable SIL. DEQ has established two threshold levels: Level 1 thresholds are unconditional thresholds, requiring no DEQ approval for use; Level 2 thresholds are conditional upon DEQ approval, which depends on evaluation of the project and the site, including emissions quantities, stack parameters, number of sources emissions are distributed amongst, distance between the sources and the ambient air boundary, and the presence of sensitive receptors near the ambient air boundary.

Real Alloy was issued PTC P-2009.0139 Project 62075, on June 12, 2018, to change the name of the facility from Real Alloy Recycling, Inc. to Real Alloy Recycling, LLC. This PTC superseded PTC P-2009.0139 Project 61440, issued May 6, 2015, which established emission and product throughput limits of emission units affected by the current project. This project requests increased daily and annual throughputs for Rotary Furnaces #3 and #6. Revised emission factors derived from performance test results were applied to the requested increased process throughputs to calculate emissions.

The existing permit regulates emissions through a limit on both production/throughput and emission rate. The facility's PTE is the achievable emission quantity associated with maximum operations under the most restrictive of either the production/throughput limit or the emission limit. With revised emission factors that are lower than what was used for setting the existing limits, the existing production/throughput restriction is now the emission-limiting permit condition that establishes PTE. Therefore, increasing production/throughput will result in an emission increase, even though the emission limit in the revised permit may not increase. Since the project is effectively a revision of the existing permit to allow an increase in production without a physical modification of the facility, the project will not be evaluated based only on the change in emissions (therefore, Level 1 or Level 2 Modeling Applicability Thresholds are not applicable). The required air impact analyses are a revision of the analyses performed in support of the 2015 permit establishing the emission and production/throughput limits that are now proposed for change by this project.

Table 2 summarizes NAAQS compliance demonstration applicability. The increase in emissions resulting from the project are shown and compared to Modeling Applicability Thresholds for information purposes only. Modeling Applicability Thresholds were not used to evaluate the need to perform project-specific air impact modeling, as described above. Effectively, the 2015 era facility-wide NAAQS analyses were revised using future allowable PTE values with current meteorological data, ambient background values, and AERMOD version.

Table 2. CRITERIA POLLUTANT SIL AND NAAQS COMPLIANCE DEMONSTRATION APPLICABILITY

Pollutant	Averaging Period	BRC[a] Threshold (ton/year)	Post Project Facility-wide Emissions (ton/year)	Project Exempted Based on Facility-wide BRC?	Applicable Potential Emissions Increase for the Project	Level 1 Modeling Thresholds[b]	Project Exempted Based on Level 1 Thresholds?
PM_{10}[c]	24-hour average	1.5	6.7	No	1.5 lb/hr	0.22 lb/hr[e]	No
$PM_{2.5}$[d]	24-hour average	1.0	6.7	No	1.5 lb/hr	0.054 lb/hr	No
	Annual				6.7 T/yr[f]	0.35 T/yr	No
Carbon Monoxide (CO)	1-hour and 8-hour	10	59.2	No	14.5[g] lb/hr	15 lb/hr	Yes
Sulfur Dioxide (SO_2)	1-hour and 3-hour	4.0	0.23	Yes	NA[h]	0.21 lb/hr	NA[h]
Nitrogen Oxides (NOx)	1-hour	4.0	27.7[h]	No	11.2[g,i] lb/hr	0.20 lb/hr	No
	Annual				27.7[i] T/yr	1.2 T/yr	No
Lead (Pb)	monthly	0.06	1.0E-05	Yes	NA	14 lb/month	NA[h]

a. Below Regulatory Concern equal to 10% of the significant emission rate.
b. Modeling Applicability Thresholds were not used, but are listed for comparative purposes.
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
d. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
e. Pounds per hour.
f. Tons/year.
g. Maximum hourly emission rate based on rated engine capacity instead of the emission inventory submittal's calculation method to derive an hourly emission rate by averaging 500 hours per year of operation over 8,760 hours per year.
h. Not assessed because facility-wide emissions are below BRC thresholds.
i. Emergency engine NOx emissions count toward applicability but are not required for inclusion in 1-hour NO_2 SIL and NAAQS modeling per DEQ policy.

2.3.2 Ozone Modeling Applicability

Ozone (O_3) differs from other criteria pollutants in that it is not typically emitted directly into the atmosphere. O_3 is formed in the atmosphere through reactions of VOCs, NO_x, and sunlight. Atmospheric dispersion models used in stationary source air permitting analyses (see Section 3.3.3) cannot be used to estimate O_3 impacts resulting from VOC and NOx emissions from an industrial facility. O_3 concentrations resulting from area-wide emissions are predicted by using more complex airshed models such as the Community Multi-Scale Air Quality (CMAQ) modeling system. Use of the CMAQ model is very resource intensive and DEQ asserts that performing a CMAQ analysis for a particular permit application is not typically a reasonable or necessary requirement for air quality permitting.

Addressing secondary formation of O_3 has been somewhat addressed in EPA regulation and policy. As stated in a letter from Gina McCarthy of EPA to Robert Ukeiley, acting on behalf of the Sierra Club (letter from Gina McCarthy, Assistant Administrator, United States Environmental Protection Agency, to Robert Ukeiley, January 4, 2012):

> *. . . footnote 1 to sections 51.166(I)(5)(I) of the EPA's regulations says the following: "No de minimis air quality level is provided for ozone. However, any net emission increase of*

100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data."

The EPA believes it unlikely a source emitting below these levels would contribute to such a violation of the 8-hour ozone NAAQS, but consultation with an EPA Regional Office should still be conducted in accordance with section 5.2.1.c. of Appendix W when reviewing an application for sources with emissions of these ozone precursors below 100 TPY."

Allowable facility-wide emissions estimates for the project of VOCs at 3.5 ton/year and NOx at 28.7 ton/year are well below the 100 ton/year threshold, and DEQ determined it was not appropriate or necessary to require a quantitative source-specific O_3 impact analysis.

Secondary formation of ozone on an 8-hour basis was not required to be evaluated for particulate formation from VOCs and NOx emissions.

2.3.3 Secondary Particulate Formation Modeling Applicability

The impact from secondary particulate formation resulting from allowable facility-wide emissions of NOx at 28.7 ton/year and SO_2 at 0.2 ton/year was assumed by DEQ to be negligible on the basis of the magnitude of emissions and the short distance from emissions sources to modeled receptors where maximum PM_{10} and $PM_{2.5}$ impacts would be anticipated.

Requested allowable facility-wide criteria pollutant emissions were below annual significant emission rate thresholds. Secondary formation of $PM_{2.5}$ on 24-hour and annual bases was not required to be evaluated for particulate formation from SO_2 and NO_x.

2.4 Significant and Cumulative NAAQS Impact Analyses

If maximum modeled pollutant impacts to ambient air from emissions sources associated with a new facility or the emissions increase associated with a modification exceed the SILs of Idaho Air Rules Section 006 (referred to as a significant contribution in Idaho Air Rules), or as incorporated by reference as per Idaho Air Rules Section 107.03.b, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with NAAQS and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis may also be required for permit revisions driven by compliance/enforcement actions, any correction of emissions limits or other operational parameters that may affect pollutant impacts to ambient air, or other cases where DEQ believes NAAQS may be threatened by the emissions associated with the facility or proposed project.

A cumulative NAAQS impact analysis for attainment area pollutants involves assessing ambient impacts, according to established DEQ/EPA guidance, policies, and procedures, from applicable facility-wide emissions and emissions from any nearby co-contributing sources. A DEQ-approved background concentration value is then added to the modeled result that is appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 3. Table 3 also lists SILs and specifies the modeled design value that must be used for comparison to the NAAQS. NAAQS compliance is evaluated on a receptor-by-receptor basis.

Table 3. APPLICABLE REGULATORY LIMITS				
Pollutant	**Averaging Period**	**Significant Impact Levels[a] (μg/m³)[b]**	**Regulatory Limit[c] (μg/m³)**	**Modeled Design Value Used[d]**
PM_{10}[e]	24-hour	5.0	150[f]	Maximum 6th highest[g]
$PM_{2.5}$[h]	24-hour	1.2	35[i]	Mean of maximum 8th highest[j]
	Annual	0.2	12[k]	Mean of maximum 1st highest[l]
Carbon monoxide (CO)	1-hour	2,000	40,000[m]	Maximum 2nd highest[n]
	8-hour	500	10,000[m]	Maximum 2nd highest[n]
Sulfur Dioxide (SO_2)	1-hour	3 ppb[o] (7.8 μg/m³)	75 ppb[p] (196 μg/m³)	Mean of maximum 4th highest[q]
	3-hour	25	1,300[m]	Maximum 2nd highest[n]
Nitrogen Dioxide (NO_2)	1-hour	4 ppb (7.5 μg/m³)	100 ppb[s] (188 μg/m³)	Mean of maximum 8th highest[t]
	Annual	1.0	100[r]	Maximum 1st highest[n]
Lead (Pb)	3-month[u]	NA	0.15[r]	Maximum 1st highest[n]
	Quarterly	NA	1.5[r]	Maximum 1st highest[n]
Ozone (O_3)	8-hour	40 TPY VOC[v]	70 ppb[w]	Not typically modeled

a. Idaho Air Rules Section 006 (definition for significant contribution) or as incorporated by reference as per Idaho Air Rules Section 107.03.b.
b. Micrograms per cubic meter.
c. Incorporated into Idaho Air Rules by reference, as per Idaho Air Rules Section 107.
d. The maximum 1st highest modeled value is always used for the significant impact analysis unless indicated otherwise. Modeled design values are calculated for each ambient air receptor.
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers.
f. Not to be exceeded more than once per year on average over 3 years.
g. Concentration at any modeled receptor when using five years of meteorological data.
h. Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers.
i. 3-year mean of the upper 98th percentile of the annual distribution of 24-hour concentrations.
j. 5-year mean of the 8th highest modeled 24-hour concentrations at the modeled receptor for each year of meteorological data modeled. For the SIL analysis, the 5-year mean of the 1st highest modeled 24-hour impacts at the modeled receptor for each year.
k. 3-year mean of annual concentration.
l. 5-year mean of annual averages at the modeled receptor.
m. Not to be exceeded more than once per year.
n. Concentration at any modeled receptor.
o. Interim SIL established by EPA policy memorandum.
p. 3-year mean of the upper 99th percentile of the annual distribution of maximum daily 1-hour concentrations.
q. 5-year mean of the 4th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of 1st highest modeled 1-hour impacts for each year is used.
r. Not to be exceeded in any calendar year.
s. 3-year mean of the upper 98th percentile of the annual distribution of maximum daily 1-hour concentrations.
t. 5-year mean of the 8th highest daily 1-hour maximum modeled concentrations for each year of meteorological data modeled. For the significant impact analysis, the 5-year mean of maximum modeled 1-hour impacts for each year is used.
u. 3-month rolling average.
v. An annual emissions rate of 40 ton/year of VOCs is considered significant for O_3.
w. Annual 4th highest daily maximum 8-hour concentration averaged over three years.

If the cumulative NAAQS impact analysis predicts a violation of the standard, the permit cannot be issued if the proposed project or facility has a significant contribution (exceeding the SIL) to the modeled violation. This evaluation is made specific to both time and space. The facility or project does not have a significant contribution to a violation if impacts are below the SIL at all specific receptors showing violations during the time periods when modeled violations occurred.

Compliance with Idaho Air Rules Section 203.02 is demonstrated if: a) specific applicable criteria pollutant emissions increases are at a level defined as Below Regulatory Concern (BRC), using the criteria established by DEQ regulatory interpretation[1], or alternatively, if BRC is not applicable, pollutant emissions increases are at a level below the Level 1 de minimis modeling threshold or the

DEQ-approved Level 2 modeling threshold in the DEQ *Modeling Guideline*[2]; or b) all modeled impacts of the SIL analysis are below the applicable SIL or other level determined to be inconsequential to NAAQS compliance; or c) modeled design values of the cumulative NAAQS impact analysis (modeling applicable emissions from the facility and co-contributing sources, and adding a background concentration) are less than applicable NAAQS at receptors where impacts from the proposed facility/modification exceeded the SIL or other identified level of consequence; or d) if the cumulative NAAQS analysis showed NAAQS violations, the impact of proposed facility/modification to any modeled violation was inconsequential (typically assumed to be less than the established SIL) for that specific receptor and for the specific modeled time when the violation occurred.

2.5 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permitting requirements for toxic air pollutants (TAPs) from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the total project-wide emissions increase of any TAP associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated.

Idaho Air Rules Section 210.20 states that if TAP emissions from a specific source are regulated by the Department or EPA under 40 CFR 60 (NSPS), 61 (NESHAP), or 63 (MACT), then a TAP impact analysis under Section 210 is not required for that TAP. The DEQ permit writer evaluates the applicability of specific TAPs to the Section 210.20 exclusion. The facility's rotary furnaces (RF#3 and RF#6) are subject to 40 CFR 63 Subpart RRR, and emissions of hydrogen chloride, fluorides, and dioxins and furans, which are state TAPs that are also federal HAPs regulated by this MACT standard, are exempted from modeling requirements. The diesel-fired emergency firewater pump engine is subject to area source requirements for 40 CFR 63 Subpart ZZZZ.

There were no TAPs emissions increases from emissions units not regulated by an NSPS, NESHAP, or MACT, thus, no other TAPs emission exceeded any screening emission rate limit listed in Sections 585 and 586 of the Idaho *Air Rules*.

The ambient impact analyses for PTC P-2009.0139 Project 61440, issued May 6, 2015, analyzed TAPs compliance for natural gas combustion in heaters supporting each rotary furnace and RF#3 and RF#6, as well as two small crucible heaters. Arsenic, cadmium, formaldehyde, and nickel emissions were emitted from the primary furnace stacks #6 and #7, which are controlled with trona-injected baghouses. Formaldehyde emissions from the diesel-fired emergency firewater pump engine were also included, and it is evident that the engine's TAPs that are HAPs qualified for exemption under Section 210.20 of the Idaho *Air Rules*, including formaldehyde. The 2015-era project's TAPs analyses utilized a unit emission rate analysis using the maximum annual impact for each stack that was not paired in space or time. The unit emission rate impact showed that the engine stack had a maximum annual impact over 3 times greater than either rotary furnace stack. The diesel engine's formaldehyde emission rate of 0.00485 pounds/hour was approximately equal to the total natural combustion formaldehyde emissions for the rotary furnace stacks combined (0.0042 pounds/hour), so the majority of the facility-wide formaldehyde ambient impact was attributed to the engine. Impacts for the arsenic, cadmium, and nickel emissions were 8% or less than the allowable increment; and based on the results of the revised criteria pollutant analyses, DEQ is confident that TAPs compliance would not be affected. Also, there is no underlying emissions increase to trigger any such remodeling requirement.

TAPs modeling was not required nor performed for this project.

3.0 Analytical Methods and Data

3.1 Modeling Methodology

This section describes the modeling methods used by DEQ to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

DEQ performed project-specific air impact analyses that were regarded by DEQ to be reasonably representative of the facility, using established DEQ policies, guidance, and procedures. Results of the submitted analyses, in combination with DEQ's analyses, demonstrated compliance with applicable air quality standards to DEQ's satisfaction, provided the facility is operated as described in the submitted application and in this memorandum. The DEQ-approved dispersion modeling analyses submitted by Real Alloy for PTC P-2009.0139 Project 61440, issued May 6, 2015, was used as the baseline model setup for this project.

Table 4 provides a brief description of parameters used in the modeling analyses. The Project 61440 modeling demonstration's setup for receptors, buildings, and emission points was used for the basis of these ambient impact analyses and this information is presented in Table 4.

Table 4. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Addition Description
General Facility Location	Post Falls, Idaho	The area is an attainment or unclassified area for all criteria pollutants.
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 19191.
Meteorological Data	Spokane	2012-2016 - See Section 3.1.5 of this memorandum. Surface data from Coeur d'Alene and upper air data from Spokane, Washington.
Terrain	Considered	Receptor, building, and emissions source stack base elevations were determined using USGS 1.0 arc second National Elevation Dataset

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description**
		(NED) files based on the NAD83 datum.
Building Downwash	Considered	Plume downwash was considered for the structures associated with the facility.
Receptor Grid	Grid 1	50-meter spacing along the ambient air boundary except along the southeast ambient air boundary, shared with Solid Rock Gate Supply, where the 15-meter spacing is present and along the eastern boundary where a maximum spacing of 45 meters was present.
	Grid 2	15-meter spacing within the property parcel in the southeast corner of the property owned and operated by Solid Rock Gate Supply.
	Grid 3	50-meter spacing in a rectangular grid from the ambient air boundary outward to a distance of 500 meters along the ambient air boundary in the primary south, east, and west directions. North of the ambient air boundary and in the regions not covered by the 50-meter rectangular grid, located southwest and southeast of the facility, receptors were spaced at distances ranging from approximately 5 meters to 150 meters.
	Grid 4	100-meter spacing in a 2,000-meter (x) by 2,000-meter (y) rectangular grid roughly centered on Grid 3.
	Grid 5	250-meter spacing in a 5,000-meter (x) by 5,000-meter (y) rectangular grid centered on Grid 4.
	Grid 6	500-meter spacing in a 10-kilometer (x) by 10-kilometer (y) rectangular grid centered on Grid 5.
	Grid 7	1,000-meter spacing in a 20-kilometer (x) by 20-kilometer (y) rectangular grid centered on Grid 6.
	Grid 8	5,000-meter spacing in a 100-kilometer (x) by 100kilometer (y) rectangular grid centered on Grid 7.

3.1.2 Modeling Protocol

A modeling protocol was not submitted to DEQ for this project. Project-specific modeling was conducted using data and methods described in the *Idaho Air Modeling Guideline*[2].

3.1.3 Model Selection

Idaho Air Rules Section 202.02 requires that estimates of air pollutant concentrations in ambient air be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple-source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. AERMOD retains the single straight-line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

DEQ used AERMOD version 19191 to evaluate pollutant impacts to ambient air from the facility, which is the current version of AERMOD.

NO_2 1-hour impacts can be assessed using a tiered approach to account for $NO/NO_2/O_3$ chemistry. Tier 1 assumes full conversion of NO to NO_2. Tier 2 Ambient Ratio Method (ARM) assumes a 0.80 default ambient ratio of NO_2/NOx. Tier 2 ARM2[3] was recently developed and replaces the previous ARM. Recent EPA guidance[4] on compliance methods for NO_2 states the following for ARM2:

> "This method is based on an evaluation of the ratios of NO_2/NO_x from the EPA's Air Quality System (AQS) record of ambient air quality data. The ARM2 development report (API, 2013)

specifies that ARM2 was developed by binning all the AQS data into bins of 10 ppb increments for NO_x values less than 200 ppb and into bins of 20 ppb for NO_x in the range of 200-600 ppb. From each bin, the 98th percentile NO_2/NO_x ratio was determined and finally, a sixth-order polynomial regression was generated based on the 98th percentile ratios from each bin to obtain the ARM2 equation, which is used to compute a NO_2/NO_x ratio based on the total NO_x levels."

Tier 3 methods account for more refined assessment of the NO to NO_2 conversion, using a supplemental modeling program with AERMOD to better account for $NO/NO_2/O_3$ atmospheric chemistry. Either the Plume Volume Molar Ratio Method (PVMRM) or the Ozone Limiting Method (OLM) can be specified within the AERMOD input file for the Tier 3 approach. EPA guidance (Memorandum: from Tyler Fox, Leader, Air Quality Modeling Group, C439-01, Office of Air Quality Planning and Standards, USEPA; to Regional Air Division Directors. *Additional Clarification Regarding Application of Appendix W Modeling Guidance for the 1-hour NO_2 National Ambient Air Quality Standard.* March 01, 2011) has not indicated a preference for one option over the other (PVMRM vs OLM) for particular applications.

The Tier 2 ARM2 and Tier 3 PVMRM and OLM methods are now regulatory options following the publication of final changes to EPA's Guideline on Air Quality Models on January 17, 2017. DEQ used the Tier 1 compliance method for the 1-hour NO_2 and annual NO_2 NAAQS demonstrations where 100% of NOx is assumed to be converted to NO_2. This is a conservative approach and if compliance is easily demonstrated using the Tier 1 method there is no need to apply Tier 2 or Tier 3 methods.

The existing diesel-fired emergency electricity generator engines are exempted from 1-hour NO_2 modeling requirements, but modeling may be required for all other pollutants and averaging periods.

AERMOD algorithms for treatment of point sources with horizontal release orientation or equipped with a rain cap that impedes the vertical momentum of exhaust plumes were adopted as guideline techniques with the revisions to Appendix W (Guideline on Air Quality Models). The Appendix W final rule was signed by the Administrator on December 2016, and published in January 17, 2017, in the Federal Register, with a delayed final effective date of May 22, 2017. This method eliminates momentum-induced plume rise while still accounting for thermal buoyancy-induced plume rise. All point sources in the Real Alloy analyses were modeled as uninterrupted vertical releases and horizontal or capped algorithms were not applied.

3.2 Background Concentrations

Updated background concentration values were used for analyses supporting this project. The modeling conducted for the 2015 PTC project for the construction of RF#6 used the ambient background lookup tool developed by the Northwest International Air Quality Environmental Science and Technology Consortium (NW AIRQUEST). This tool was recently replaced by a new ambient background tool developed by the Idaho Department of Environmental Quality, Washington State Department of Ecology, and Oregon Department of Environmental Quality. The new tool is based on ambient monitoring data from July 2014 through June 2017, and uses regional scale modeling of pollutants in Washington, Oregon, and Idaho, which was conducted by Washington State University using the Community Multi-Scale Air Quality Model (CMAQ), a gridded photochemical atmospheric dispersion model, using a fine resolution 4 kilometer grid. The current 2014-2017 background tool may be accessed at the following link: https://arcg.is/1jXmHH.

The background concentration is added to the design value for each pollutant and averaging period. The default ambient background values were used for 24-hour PM_{10}, 24-hour $PM_{2.5}$, annual $PM_{2.5}$, 1-hour NO_2, and annual NO_2 for the cumulative compliance demonstration.

The DEQ-approved background concentrations are shown in Tables 5.

Table 5. AMBIENT BACKGROUND CONCENTRATIONS		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	95.5
$PM_{2.5}$[c]	24-hour	21.7
	Annual	7.6
NO_2[d]	1-hour	34.2 (18.2 ppb[e])
	Annual	9.0 (4.8 ppb[e])

a. Micrograms per cubic meter, except where noted otherwise.
b. Particulate matter with an aerodynamic diameter of 10 microns.
c. Particulate matter with an aerodynamic diameter of 2.5 microns.
d. Nitrogen dioxide.
e. Parts per billion by volume.

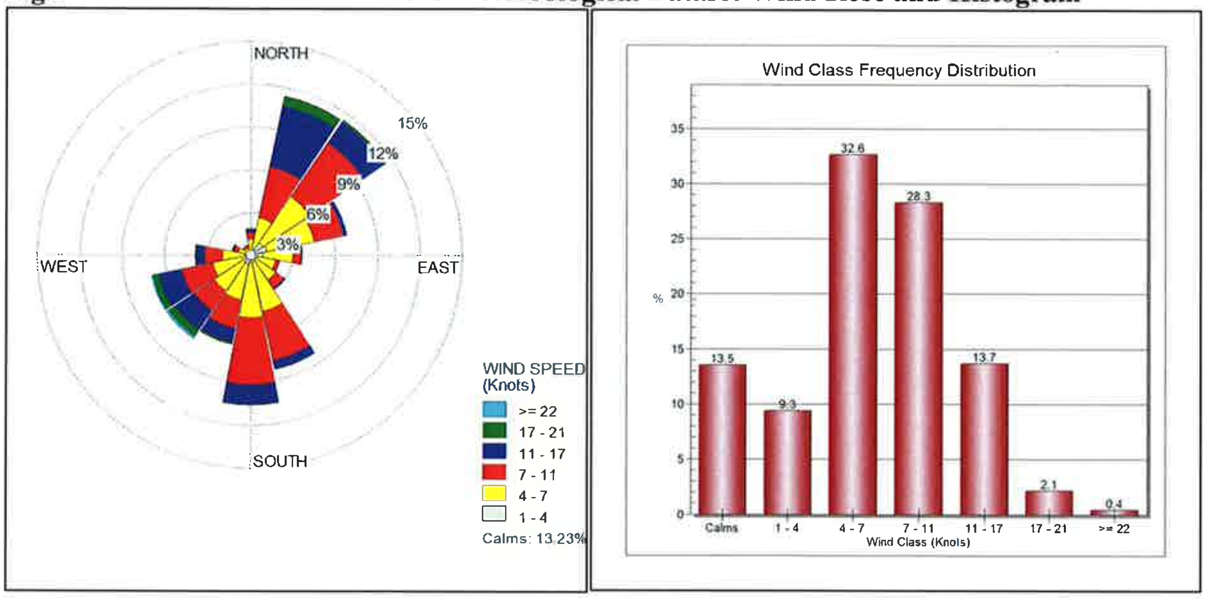
3.3 Meteorological Data

A DEQ-generated meteorological dataset using Spokane surface and upper air data for the years 2008 through 2012 was used for the previous ambient impact analyses. DEQ has generated an AERMOD-ready meteorological dataset using more current data covering 2012 through 2016, consisting of Coeur d'Alene airport surface data and Spokane airport upper air data, which is regarded by DEQ as the appropriate dataset for this project.

The dataset was generated from monitored surface data collected for five consecutive years for 2012 through 2016, at the Coeur d'Alene airport (FAA airport code KCOE, station ID 727834-24136). Upper air data were obtained from the Spokane, Washington airport (Station ID 04106). Surface characteristics were determined by DEQ staff using AERSURFACE version 13016. DEQ modeling staff evaluated annual moisture conditions for the AERSURFACE runs based on thirty years of Boise airport precipitation data. Conditions were determined to be "wet" for 2012, with 35.4 inches of precipitation, and 2016, with 27.4 inches of precipitation in this year. The year 2014 was determined to be an "average" year for precipitation with 23.5 inches of precipitation. The years 2013 and 2015 were determined to by "dry" years with 18.6 and 13.7 inches of precipitation, respectively. Average moisture conditions were established for years of moisture exceeding the 30th percentile of the thirty-year mean value of 11.2 inches. Continuous snow cover at the Coeur d'Alene airport site was determined to have existed during these years. ASOS wind data for processing with AERMINUTE and use in AERMET was not available for the Coeur d'Alene airport site. AERMET version 18101 was used to process surface and upper air data and to generate a model-ready meteorological data input file. DEQ determined these data were representative for the project site and approved use of this dataset for the project.

DEQ generated separate datasets processed with and without the "adjust U star" (ADJ_U*) option with AERMET. The ADJ_U* option adjusts the surface friction velocity (u*) to address AERMOD's tendency to over predict from some sources under stable, low wind speed conditions. The method was approved as a regulatory guideline method in EPA's final rulemaking for changes to the 40 CFR 51, Appendix W-Guideline on Air Quality Models, published in the Federal Register on January 17, 2017. The analyses were performed by using the ADJ_U* option. Figure 1 presents wind direction, frequency, and magnitude of wind speed in the meteorological dataset's wind rose and the histogram of the wind speed data. Missing data and calms were each less than 1% of the total data.

Figure 1: 2012-2016 Coeur d'Alene Meteorological Dataset Wind Rose and Histogram



3.4 *Terrain Effects*

A 1 arc second National Elevation Dataset (NED) files, in the North American Datum 1983 (NAD83), was used to calculate elevations of receptors. The terrain preprocessor AERMAP version 11103 was used to extract the elevations from the NED files and assign them to receptors in the modeling domain in a format usable by AERMOD. AERMAP also determined the hill-height scale for each receptor. The hill-height scale is an elevation value based on the surrounding terrain which has the greatest effect on that individual receptor. AERMOD uses the hill heights to evaluate whether the emissions plume has sufficient energy to travel up and over the terrain or if the plume will travel around the terrain.

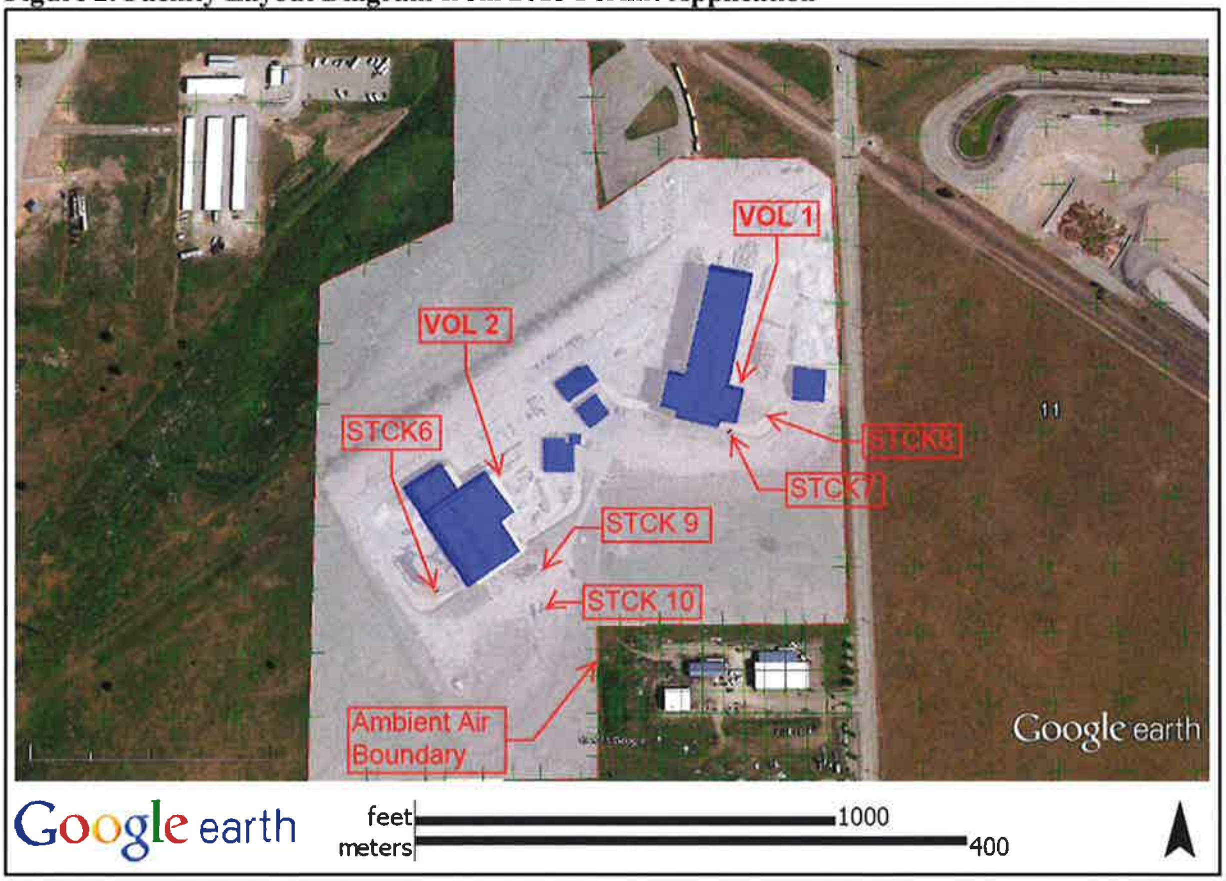
3.5 *Building Downwash Effects on Modeled Impacts*

Potential downwash effects on the emissions plume were accounted for in the model by using building dimensions and locations in the model setup. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME) was used to calculate direction-specific dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and release parameters for input to AERMOD. Modeled structure base elevations and stack base elevations nearly matched, thereby assuring that downwash is appropriately handled in the model. Base elevations of stacks were determined using AERMAP. The 2015 PTC's modeling setup was used without any changes. No structure or physical changes to stack parameters were noted in the permit application and DEQ did not alter the model setup structure and stack base elevations, release heights, and diameters.

3.6 Facility Layout

Real Alloy's modeled emission points, structures, and ambient air boundary in the model setup are shown in Figure 2. The facility's structure locations and horizontal dimensions closely matched those presented in Google earth photographic imagery.

Figure 2. Facility Layout Diagram from 2015 Permit Application



3.7 Ambient Air Boundary

The discussion for the ambient air boundary was taken from the April 22, 2015, modeling review memorandum for Project 61440, and is listed below:

> The ambient air boundary for this project was corrected in the March 19, 2015, revised modeling report and modeling files. Real Alloy has a security fence around the entire facility except in the southeastern corner of the facility. A parcel of property was sold to an entity that is independent from Real Alloy, so common ownership or control of that land does not apply. A welding and fabrication facility currently owns the parcel and the ambient air boundary was adjusted to reflect the limits of the property boundary. Section 4.1 of the final

March 19, 2015, modeling report states:

> "The public is precluded from accessing the areas excluded from the receptor network by a security fence. As the fence line will restrict public access it served as the ambient air boundary in the model. Additionally, there are no trespassing signs posted and regular security patrols that inspect the perimeter and routinely ask trespassers to leave. Attachment D provides a recordkeeping form for routine security patrols which also inspect the integrity of physical barriers and illumination that would allow security personnel to identify trespassers. There are no other features such as rivers bisecting the Facility, leasing agreements or right of ways that might complicate ambient air issues."
>
> A combination of physical obstructions and notifications including fencing, gates, and no trespassing signs will be used by Real Alloy along the entire ambient air boundary to preclude public access.

DEQ determined the ambient air boundary described uses appropriate methods to control access as described in DEQ's *Modeling Guideline*[2].

3.8 Receptor Network

Table 4 describes the receptor network used in the DEQ verification modeling analyses. The 50-meter spacing along the ambient air boundary and receptor grid is a relatively coarse grid. Design impacts were predicted to occur at the ambient air boundary near the Rotary Furnace #6 building. The highest impacts are centered in this region and impacts drop off considerably as distance from the sources increases.

Figures 3 and 4 below present the modeled receptor network for the project. This receptor network is identical to the one used in the 2015 PTC project's analyses. DEQ determined that the receptor network was adequate to reasonably assure compliance with applicable air quality standards at all ambient air locations.

Figure 3. Real Alloy Full Receptor Grid

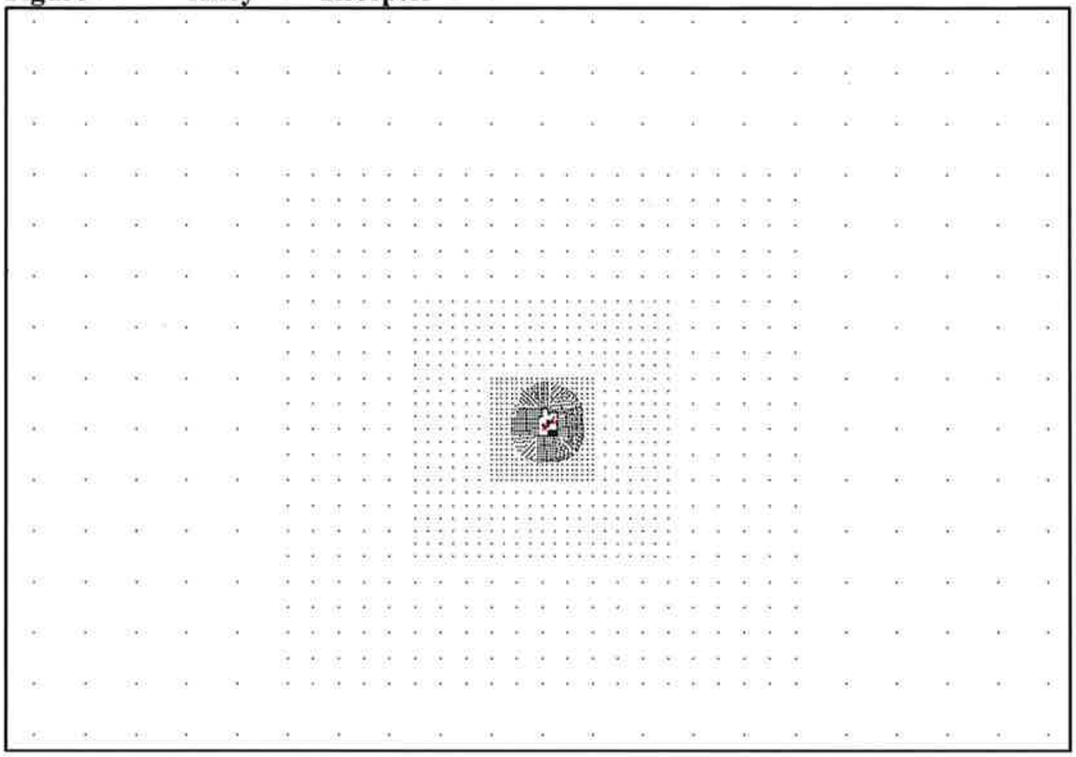
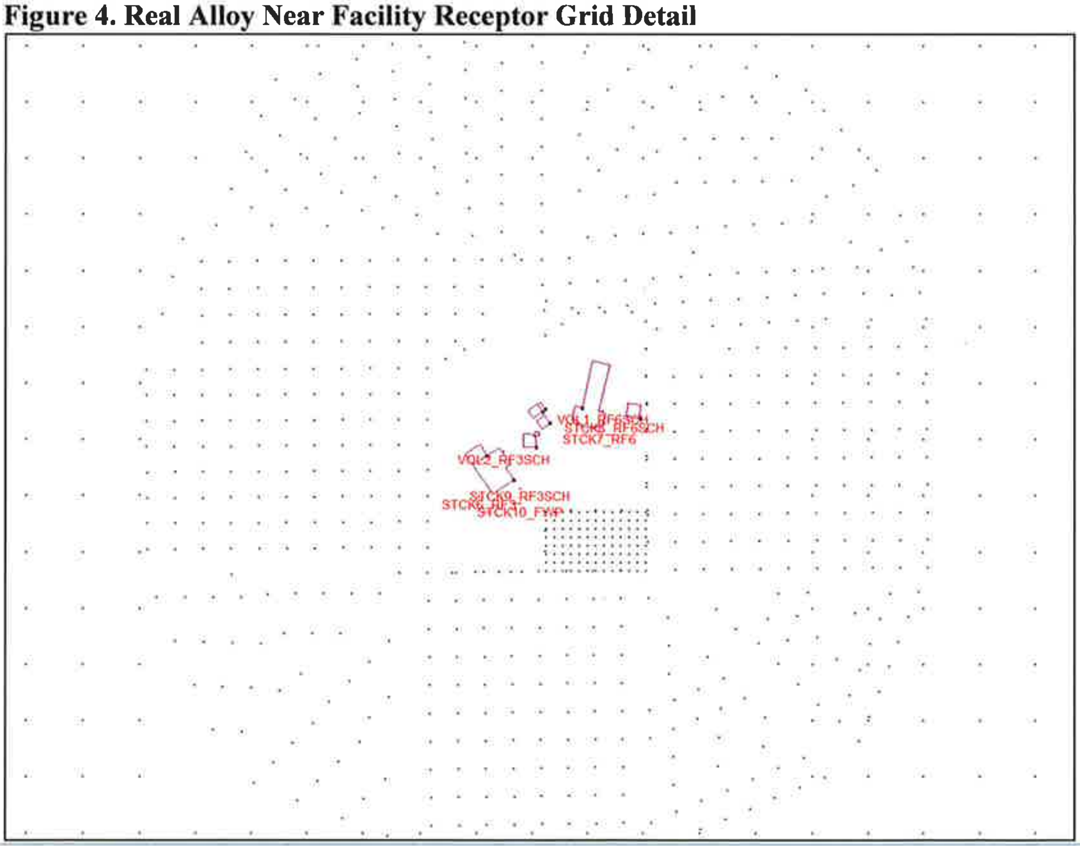


Figure 4. Real Alloy Near Facility Receptor Grid Detail



3.9 Emission Rates

Review and approval of estimated emissions is the responsibility of the DEQ permit writer, and the representativeness and accuracy of emissions estimates is not addressed in this modeling review memorandum. DEQ air impact analyses review included verification that the potential emissions rates provided in the emissions inventory were properly used in the model. The modeled emission rates must represent the maximum allowable rate as averaged over the specified period. This means maximum hourly emission rates must be used for 1-hour averaging period; for the 24-hour averaging period, the total allowable emissions over a 24-hour period may be averaged evenly over 24 hours; and, for the annual average, an average hourly emission rate may be based on the total allowable annual emissions averaged evenly over 8,760 hours per year.

DEQ modeling staff re-evaluated the emissions inventory for the emergency firewater pump engine to determine the appropriate emission rates for each averaging period. This engine is exempted from 1-hour NO_2 NAAQS modeling by DEQ policy and is exempt for 1-hour and 8-hour CO NAAQS modeling based on the Level I modeling threshold. The previous modeling analyses used hourly emission rates based on 500 hours/year of operation averaged evenly over 8,760 hours/year. Current DEQ permitting and modeling methods apply an annual operating limit of 100 hours/year for emergency generator engines, which is only applied to annual averaging periods. Air impact analyses were required for 24-hour average PM_{10} and $PM_{2.5}$ NAAQS. An hour-per-day limitation on engine operation was not requested in the permit application, so DEQ used an unlimited operation case as an upper end to establish whether a daily operating limit for testing and maintenance purposes is necessary. A second case was modeled using six hours per day, which is the upper end of requested daily operating hours for emergency engine operation, and likely to be the highest daily operating hours desired by a permittee for this source. A third case involved using the 2015 project's assumption of 1.36 hours/day (82 minutes/day). Daily emissions were averaged evenly over 24 hours per day.

Emission rates used for the dispersion modeling analyses, as listed in this memorandum, should be reviewed by the DEQ permit writer and compared with those in the final emissions inventory. All modeled criteria air pollutant and TAP emission rates must be equal to or greater than the facility's potential emissions calculated in the PTC emissions inventory or proposed permit allowable emission rates.

3.9.1 Criteria Pollutant Emissions Rates for NAAQS Analyses

Table 6 lists criteria pollutant continuous (24 hour/day) emission rates used to evaluate NAAQS compliance for standards with averaging periods of 24 hours or less, except where noted. Table 7 lists criteria pollutant continuous (8,760 hours/year) emission rates used to evaluate NAAQS compliance for standards with an annual averaging period.

The modeled PM_{10}, $PM_{2.5}$, and NO_x emission rates were based on throughput-based emission factors establishing the requested potential emission rates for the process emissions sources. The factors, as described in Real Alloy's emission inventory spreadsheet, included a 25% safety factor.

DEQ altered stack identification names used in the modeling analyses. Emission rates, except for the emergency firewater pump engine, were provided by the DEQ permit writer for the ambient air impact analyses. Salt cake handling fugitives did not reflect an additional 50% control efficiency for fugitive emissions created within a building enclosure, so the emission rates derived from the uncaptured 2% of total salt cake handling emissions are conservative estimates.

Table 6. NAAQS SHORT-TERM CRITERIA POLLUTANT EMISSION RATES				
Emissions Point	**Description**	**PM_{10}[a] (lb/hr)[b]**	**$PM_{2.5}$[c] (lb/hr)**	**NO_x[d] (lb/hr)**
STCK6_RF3	Rotary Furnace #3 Stack	0.41	0.41	2.99
STCK7_RF6	Rotary Furnace #6 Stack	0.78	0.78	2.99
STCK9_RF3SCH	Rotary Furnace #3 Salt Cake Handling Baghouse Stack	0.0395	0.0395	0
STCK8_RF6SCH	Rotary Furnace #6 Salt Cake Handling Baghouse Stack	0.0263	0.0263	0
STCK10_FWP	158 hp Diesel-fired Fire Water Pump Engine	0.3476 (24 hours/day operation)	0.3476 (24 hours/day operation)	0[e]
		Not rerun for 6 hours/day operation	0.0869 (6 hours/day operation)	
		Not rerun for 82 minutes/day operation	0.020 (82 minutes/day operation)	
VOL1_RF6SCH	Rotary Furnace#6 Salt Cake Handling Fugitives	0.0537	0.0537	0
VOL2_RF3SCH	Rotary Furnace #3 Salt Cake Handling Fugitives	0.0805	0.0805	0

a. Particulate matter with a mean aerodynamic diameter of 10 microns or less.
b. Pounds per hour.
c. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.
d. Nitrogen oxides.
e. Emergency electrical generator engines are exempted from modeling requirements for the 1-hour average NO_2 SIL and NAAQS in accordance with DEQ policy for testing and maintenance operation of 100 hours or less.[5]

Table 7. NAAQS ANNUAL CRITERIA POLLUTANT EMISSION RATES			
Emissions Point	**Description**	**$PM_{2.5}$[a] (lb/hr)[b]**	**NO_x[c] (lb/hr)**
STCK8_RF6SCH	Rotary Furnace #6 Salt Cake Handling Baghouse Stack	0.0263	0
STCK7_RF6	Rotary Furnace #6 Stack	0.78	2.99
STCK6_RF3	Rotary Furnace #3 Stack	0.41	2.99
STCK10_FWP	158 hp diesel FW Pump Engine	0.00397	0.056
STCK9_RF3SCH	Rotary Furnace #3 Salt Cake Handling Baghouse Stack	0.0395	0
VOL1_RF6SCH	Rotary Furnace#6 Salt Cake Handling Fugitives	0.0537	0
VOL2_RF3SCH	Rotary Furnace #3 Salt Cake Handling Fugitives	0.0805	0

a. Particulate matter with a mean aerodynamic diameter of 2.5 microns or less.
b. Pounds per hour.
c. Nitrogen oxides.

3.9.2 Toxic Air Pollutant Emissions

The increase in emissions from the proposed project are required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact analyses for any applicable TAP having a requested potential emission rate that exceeds the screening emissions level (EL) specified by Idaho Air Rules Section 585 or 586. Review of the TAPs emissions inventory is the responsibility of the permit writer. Real Alloy and DEQ's permit writer determined that the both of the facility's rotary furnaces and the diesel-fired emergency fire water pump engine were subject to federal emission standards, thus, all TAPs that also qualify as HAPs were not subject to modeling requirements per Section 210.20 of the Idaho *Air Rules*.

No other sources TAPs emissions were identified in the permit application. Modeling was not required to be performed to demonstrate compliance with TAP increments.

3.10 Emission Release Parameters

Tables 8, 9, 10, and 11 list emission release parameters for modeled sources at the Real Alloy facility for the NAAQS analyses in metric and English units, respectively.

Table 8. EMISSION POINT SOURCE RELEASE PARAMETERS – METRIC

Release Point	Source Description	UTM Coordinates[a]		Stack Base Elevation (m)	Stack Height (m)	Stack Gas Temp (K)[c]	Stack Exit Velocity (m/s)[d]	Stack Diameter (m)	Stack Release Type
		Easting (m)[b]	Northing (m)						
STCK7_RF6	Rotary Furnace #6 Stack	499,755.74	5,287,678.65	645.95	21.34	329.93	22.88	1.38	Default[e]
STCK6_RF3	Rotary Furnace #3 Stack	499,540.42	5,287,562.74	646.79	13.20	347.48	17.31	1.38	Default[e]
STCK8_RF6SCH	Rotary Furnace #6 Salt Cake Handling BH Stack	499,783.13	5,287,699.31	646.06	15.24	352.26	20.37	1.02	Default[e]
STCK9_RF3SCH	Rotary Furnace #3 Salt Cake Handling BH Stack	499,614.14	5,287,577.59	646.42	6.61	352.26	10.82	1.12	Default[e]
STCK10_FWP	158 hp diesel FW Pump engine	499,612.82	5,287,549.77	646.41	2.29	755.37	30.41	0.09	Default[e]

a. Universal Transverse Mercator, NAD83 horizontal datum, Zone 11.
b. Meters.
c. Kelvin.
d. Meters per second.
e. "Default" release represents a vertical orientation with an uninterrupted release point.

Table 9. FUGITIVE EMISSION RELEASE PARAMETERS – METRIC

Release Point	Source Description	UTM Coordinate[a] Easting (m)[b]	UTM Coordinate Northing (m)	Source Base Elevation (m)	Release Height (m)	Initial Horizontal Dimension (m)	Initial Vertical Dimension (m)
VOL1_RF6SCH	Rotary Furnace#6 Salt Cake Handling Fugitives	499,762.24	5,287,714.06	645.88	0	1.134	8.0
VOL2_RF3SCH	Rotary Furnace #3 Salt Cake Handling Fugitives	499,584.28	5,287,643.13	646.75	0	1.134	8.0

a. Universal Transverse Mercator, NAD83 horizontal datum, Zone 11.
b. Meters.

Table 10. EMISSIONS POINT RELEASE PARAMETERS – ENGLISH									
Release Point	**Source Description**	**UTM Coordinate[a] Easting (m)[b]**	**UTM Coordinate Northing (m)**	**Stack Base Elevation (ft)[c]**	**Stack Height (ft)**	**Stack Gas Temp (°F)[d]**	**Stack Flow Velocity (fps)[e]**	**Stack Diam (ft)**	**Stack Release Type**
STCK7_RF6	Rotary Furnace #6 Stack	499,783.13	5,287,699.31	2,119.62	50.0	174.4	66.85	3.33	Default[f]
STCK6_RF3	Rotary Furnace #3 Stack	499,755.74	5,287,678.65	2,119.26	70.0	134.2	75.06	4.52	Default[f]
STCK8_RF6SCH	Rotary Furnace #6 Salt Cake Handling Baghouse Stack	499,540.42	5,287,562.74	2,122.01	43.3	165.8	56.81	4.52	Default[f]
STCK9_RF3SCH	Rotary Furnace #3 Salt Cake Handling Baghouse Stack	499;612.82	5,287,549.77	2,120.77	7.5	900.0	99.76	0.29	Default[f]
STCK10_FWP	158 hp diesel FW Pump engine	499,612.82	5,287,549.77	2,120.77	7.5	900.0	99.76	0.29	Default[f]

[a] Universal Transverse Mercator, NAD83 datum, Zone 11.
[b] Meters.
[c] Feet.
[d] Degrees Fahrenheit.
[e] Feet per second.
[f] Vertical and uninterrupted release.

Table 11. FUGITIVE EMISSION RELEASE PARAMETERS – ENGLISH							
Release Point	**Source Description**	**UTM Coordinate[a] Easting (m)[b]**	**UTM Coordinate Northing (m)**	**Source Base Elevation (ft)[c]**	**Release Height (ft)**	**Initial Horizontal Dimension (ft)**	**Initial Vertical Dimension (ft)**
VOL1_RF6SCH	Rotary Furnace#6 Salt Cake Handling Fugitives	499,762.24	5,2877,14.06	2,119.03	0	3.72	26.25
VOL2_RF3SCH	Rotary Furnace #3 Salt Cake Handling Fugitives	499,584.28	5,287,643.13	2,121.88	0	3.72	26.25

[a] Universal Transverse Mercator, NAD83 horizontal datum, Zone 11.
[b] Meters.
[c] Feet.

DEQ's permitting policies and guidance require that each permit application have stand-alone documentation to support the appropriateness of release parameters used in the air impact analyses. The modeling report submitted to DEQ by Real Alloy in the May 2015 permitting project provided justification and documentation of assumptions and data supporting key release parameters used to model the facility's emission sources, except for the exhaust flow rates and exit temperatures for the

RF#3 and RF#6 trona-injected baghouse stacks. Exhaust flow rates and exit temperatures were based on recent performance test documentation for these two stacks.
Stack base elevations for point sources and structure base elevations where the stacks were located were nearly identical, which created a consistent relationship between stack and structures base elevations versus building tier heights for evaluating building downwash effects with BPIP-PRIME.

- **Rotary Furnace #3 (model ID STCK6_RF3)**
  A performance test was conducted on June 26, 2019, for PM, which was used to establish PM_{10} and $PM_{2.5}$ emission factors. A performance test was also conducted on November 29, 2018, which was used to establish a NOx emission factor. Modeling staff was not able to locate the November 29, 2018, performance test in DEQ's document database. The 3-run average exhaust flow rate and exit temperature from June 26, 2019, test were applied in DEQ's revised model setup. The average exhaust flow rate was 54,715 actual cubic feet per minute (ACFM) and the average exhaust temperature was 165.8 degrees Fahrenheit (°F).

  Stack release height and exit diameter were taken from the May 6, 2015, PTC project's model report, and these release parameters were justified by Real Alloy as field-measured values. The performance test report documentation lists the stack diameter as 4.5 feet at the sampling port location.

- **Rotary Furnace #6 (model ID STCK7_RF6)**
  Performance tests were conducted on the RF#6 stack for fluorides, dioxins and furans, hydrogen chloride, PM for PM_{10} and $PM_{2.5}$, and NOx. The NOx test was not found in DEQ's records database. Test average stack flow rates ranged from 72,293 ACFM to 97,747 ACFM. Exhaust temperature ranged from 134.2 °F to 187.4 °F. Worst-case minimum values of 72,293 ACFM and 134.2 °F were applied by DEQ to the model setup.

  Stack release height and diameter were justified in the May 6, 2015, PTC modeling report as field-measured values. The performance test report documentation lists the stack diameter as 4.5 feet at the sampling port location.

DEQ's analyses supporting issuance of this project's permit revision utilized the same release parameters that Real Alloy applied in the modeling demonstration supporting PTC P-2009.0139 Project 61440, issued May 6, 2015, for the other modeled sources. DEQ modeling staff assumed the locations and other release parameters for the RF#6 Salt Cake Handling Baghouse and fugitive volume source are accurate for use in this project's analyses. The modeling review memorandum in the May 6, 2015, SOB modeling memorandum lists the following DEQ review discussion for the remaining release parameters:

STACK #8 (current model ID STCK8_RF6SCH)
Stack #8 represents the baghouse-controlled stack venting emissions collected from the salt cake handling for proposed Rotary Furnace #6. Emissions from an intermittent crucible cleaning operation were also assumed to be vented to this stack. As discussed above, the exhaust parameters for this source were stated as being based on design information that was available at the time the application was submitted. The same stack temperature for the trona-injected baghouse stack for a rotary furnace was applied to salt cake handling and crucible cleaning. It is unknown how the exit temperatures for these two dissimilar processes compare and if there is a varying temperature profile over the period the slag cools before it is transported from the salt cake cooling area. As described above for Stack #7, DEQ found the exhaust parameter substantiation

lacked the necessary detail to concur that exhaust parameters were accurately established for this point source.

STACK #9 (current model ID STCK9_RF3SCH)
Stack #9 is the baghouse-equipped stack that vents the salt cake handling process associated with existing Rotary Furnace #3. The salt cake cooler was removed from service in a previous air permitting project. Real Alloy used the average temperature for the trona-injected baghouse stack that exhausts emissions for existing Rotary Furnace #3. Measured values or design data representative of this source for stack volumetric flow rate and temperature were not available at this time. Real Alloy and Conestoga-Rovers described the values as being based on the best engineering estimate assuming conservative exhaust flow rates. Stack release height and diameter were described as having been measured on-site.

STACK #10 (current model ID STCK10_FWP)
Stack #10 vents the exhaust from the 158-horspower diesel-fired generator engine used to power the firewater pump at the facility. DEQ accepted the modeled exhaust parameters without additional substantiation due to the limited and intermittent operation of the source and the exhaust parameters appear reasonable given the modeled release height of 2.3 meters above grade indicates that the engine is equipped with a very short stack.

VOL1 and VOL2 (current model IDsVOL1_RF6SCH and VOL2_RF3SCH)
The fugitive emissions for the salt cake handling and crucible cleaning operations were modeled as ground level release volume sources from each building housing the process areas. Real Alloy's submittal states that the dimensions of the sources are based on the approximate dimensions of the opening of the bay doorways on each building. The release height was assumed to be at ground level. Given the extremely small particulate matter emissions rates presented in the modeling demonstration for these fugitive sources DEQ accepted the release parameters as submitted.

Of additional note, the diesel-fired emergency firewater pump engine exit temperature falls within the values supported by the Washington Department of Ecology's documentation[6] of various diesel-fired emergency engines. The modeled exit velocity was 30 meters/second, which is well below the 50 meter/sec threshold where DEQ typically requests additional substantiation, and it is accepted as an appropriately conservative value.

DEQ concludes that the release parameters used in the air impact modeling analyses were adequately supported and were appropriate for this project.

4.0 Results for Air Impact Analyses

DEQ performed ambient air impact analyses reflecting the requested allowable emissions rates listed in the permit application, except for the emergency fire water pump engine, where short-term averaging period emission rates were altered by DEQ to reflect emission rates based on the averaging period rather than using annual emissions averaged over 8,760 hours per year to determine whether a daily operating limitation is warranted. $PM_{2.5}$ 24-hour impacts were limiting for NAAQS compliance, and three $PM_{2.5}$ scenarios were analyzed to evaluate permit limit recommendations for emergency engine testing and maintenance operation. The first scenario applied unlimited daily operation of the emergency engine to determine whether an operating hour limitation recommendation would be required, a second scenario applied what is generally considered a very flexible amount of engine operation at 6 hours per 24-hour period, and a third scenario reflecting the application's emissions inventory equivalent operations at 82 minutes per 24-hour period. The 24-hour average PM_{10} NAAQS analyses modeled firewater pump with unlimited operation at 24 hours per day. Predicted

Annual operating hours for the emergency firewater pump engine were limited to 100 hours per year for annual NO_2 and annual $PM_{2.5}$ NAAQS analyses, which reflects the current standard annual limitation on operating hours.

4.1 Results for Significant Impact Analyses

DEQ did not perform SIL analyses for this project. This project was performed to establish NAAQS compliance for pollutants and averaging periods subject to modeling requirements using the current version of AERMOD, current meteorological data, and the project's potential emissions. A cumulative impact analysis was conducted for all pollutants and averaging periods where future requested potential emissions exceeded the Level I modeling thresholds specified in the DEQ *Modeling Guideline*[2] or the BRC exemption from NAAQS compliance requirements.

4.2 Results for Cumulative NAAQS Impact Analyses

The results for the cumulative impact analyses are listed in Table 12. Ambient impacts for the facility were below the applicable NAAQS.

Table 12. RESULTS FOR CUMULATIVE IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Design Value Concentration (µg/m³)[a]	Background Concentration (µg/m³)	Maximum Total Ambient Impact (µg/m³)	NAAQS[b] (µg/m³)	Percent of NAAQS
NO_2[c]	1-hour	35.5[f]	34.2	69.7	188	37%
	Annual	2.6[g]	9.0	11.6	100	12%
$PM_{2.5}$[d]	24-hour (worst-case unlimited 24 hours/day operation of emergency firewater pump engine)	10.5[h]	21.7	32.2	35	92%
	24-hour (emergency firewater pump engine limited to 6 hours/day operation)	5.4[h]		27.1		77%
	24-hour (emergency firewater pump engine limited to 82 minutes/day operation per application emission inventory)	5.0[h]		26.7		76%
	Annual	1.1[i, j]	7.6	8.7	12	73%
PM_{10}[e]	24-hour	14.7[k, l]	95.5	14.7	150	73%

Table 12. RESULTS FOR CUMULATIVE IMPACT ANALYSES

a. Micrograms per cubic meter.
b. National ambient air quality standards.
c. Nitrogen dioxide.
d. Particulate matter with an aerodynamic diameter of 2.5 microns or less.
e. Particulate matter with an aerodynamic diameter of 10 microns or less.
f. Modeled design value is the maximum 5-year mean of 8th highest daily 1-hour maximum impacts for each year of a 5-year meteorological dataset. 100% conversion of NOx to NO_2 was assumed.
g. Maximum annual average impact from 5 individual years of meteorological data is typically used. A concatenated 5-year dataset with the maximum annual impact averaged over 5 years was used in this analysis. The margin of compliance is large and compliance is adequately demonstrated.
h. Modeled design value is the maximum 5-year mean of 8th highest 24-hour average impacts for each year of a 5-year meteorological dataset.
i. Maximum annual impact averaged over 5 years of meteorological data.
j. The firewater pump was modeled with an average hourly emissions rate based on 100 hours per year of operation averaged evenly over 8,760 hours per year.
k. Design value is the 6th highest impact from a 5-year meteorological dataset.
l. Worst-case assumption of 24 hours per day of emergency fire water pump engine operation. Impacts were low enough not to warrant additional modeling runs reflecting limited hours of operation.

5.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the Real Alloy facility will not cause or significantly contribute to a violation of any NAAQS and will not exceed allowable TAP increments.

References

1. *Policy on NAAQS Compliance Demonstration Requirements of IDAPA 58.01.01.203.02 and 403.02.* Idaho Department of Environmental Quality Policy Memorandum. Tiffany Floyd, Administrator, Air Quality Division, June 10, 2014.

2. *State of Idaho Guideline for Performing Air Quality Impact Analyses.* Idaho Department of Environmental Quality. September 2013. State of Idaho DEQ Air Doc. ID AQ-011. Available at http://www.deq.idaho.gov/media/1029/modeling-guideline.pdf.

3. *Ambient Ratio Method Version 2 (ARM2) for use with AERMOD for1-hr NO_2 Modeling Development and Evaluation Report,* Prepared for American Petroleum Institute, 1220 L Street NW, Washington, DC 20005, by M. Podrez, RTP Environmental Associates, Inc., 2031 Broadway, Suite 2, Boulder, Colorado 80302, September 20, 2013.

4. *Clarification on the Use of AERMOD Dispersion Modeling for Demonstrating Compliance with the NO_2 National Ambient Air Quality Standard,* R. Chris Owen and Roger Brode, Environmental Protection Agency, Office of Air Quality Planning and Standards, September 30, 2014.

5. *DEQ Guidance for Minor New Source Review Modeling of 1-Hour NO_2 from Intermittent Testing of Emergency Engines*, State of Idaho Department of Environmental Quality September 2013, Doc. I D AQ-011 (September 2013).

6. *Suitability of Diesel-Powered Emergency Generators for Air Quality General Order of Approval: Evaluation of Control Technology, Ambient Impacts, and Potential Approval Criteria*, Washington State Department of Ecology, Air Quality Program, General Order Engineering Team, June 26, 2006.

APPENDIX C – FACILITY DRAFT COMMENTS

The following comments were received from the facility on November 14, 2019:

Facility Comment: We suggest that a consistent, common name should be use for the furnaces in the PTC and SOB. (RF3 and RF6 is what we decided to name the furnaces going forward) Will need change permit and SOB to reflect these names for these furnaces only. There are several names that reference the same two furnaces now.

DEQ Response: All references to Rotary Furnaces #3 and #6 were changed to use the nomenclature RF3 and RF6, respectively.

Facility Comment: Remove Section 2.9 in the PTC. We don't have a #2 Rotary that we are going to leave idle. There were two Reverb furnaces back in the 2003 time period known as #2 and #3 but they are long gone.

DEQ Response: Permit Condition 2.9 was removed.

Facility Comment: Both Section 2.5 and Section 2.13 should read similar in the permit.

DEQ Response:

Facility Comment: See my markups on changes proposed to recordkeeping on Section 2.13 in the PTC. We currently track charge materials on a per heat cycle basis and intend to continue while calculating the average daily and rolling 12-month totals for the permit.

DEQ Response: The marked changes were incorporated to align the emission limits with the recordkeeping requirements.

Facility Comment: Name of the facility has been updated since the May 2018 sale of the company to its current ownership team.

DEQ Response: An instance of the incorrect company name "Real Alloy Inc." was changed to "Real Alloy LLC".

APPENDIX D – PROCESSING FEE

Payment Receipt

Idaho Department of Environmental Quality
State Fiscal Office
1410 North Hilton
Boise ID 83706

Received From:
REAL ALLOY RECYCLING INC
REAL ALLOY RECYCLING INC
JEFF BOHANNON
16168 WEST PRARIE AVE
POST FALLS, ID 83854

Date Received	12/03/2019	**Payment Amount**	$1,000.00
Payment Method	Check		
Check/Ref. No.	1100057508		

Invoices Paid

Date	Number	Amount Applied
11/07/2019	14132	-$1,000.00