DES
DEPARTMENT OF ENVIRONMENT AND SUSTAINABILITY

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PART 70
TECHNICAL SUPPORT DOCUMENT
(STATEMENT of BASIS)

APPLICATION FOR:
Reopen for Cause with a minor revision

SUBMITTED BY:
Titanium Metals Corporation
Source ID: 19

LOCATION:
181 North Water Street
Henderson, Nevada 89015

SIC Code 3339: Primary Smelting and Refining of Nonferrous Metals, Except Copper and Aluminum

NAICS Code 331410: Nonferrous (except Aluminum) Smelting and Refining

November 22, 2021

EXECUTIVE SUMMARY

Titanium Metals Corporation (TIMET), located in the Black Mountain Industrial Complex near Henderson, is a titanium "sponge" manufacturing facility that converts rutile ore into titanium metal. The legal description of the source's location is as follows: Portions of T22S, R62E, Section 12 in the Las Vegas Valley, County of Clark, Nevada. TIMET is situated in Hydrographic Area 212 (the Las Vegas Valley), which the U.S. Environmental Protection Agency (EPA) has designated an attainment area for all pollutants except ozone. Effective August 3, 2018, EPA designated Hydrographic Area 212 as a marginal nonattainment area for the 2015 national ozone standard. This is not a categorical source.

TIMET emits PM_{10}, $PM_{2.5}$, CO, NO_x, SO_2, VOCs, and HAPs. TIMET is a major stationary source for CO, a synthetic minor source for PM_{10}, $PM_{2.5}$ and total HAPs, and a minor source for NO_x, SO_2, VOCs, and individual HAPs. The sponge plant (chlorination, magnesium recovery, and vacuum distillation process) produces up to 125 million pounds of $TiCl_4$ and 32 million pounds of titanium sponge per year. The melt shop uses the vacuum arc re-melt process to produce titanium ingots from sponge, scrap, alloy ingredients, and elemental additives. TIMET is capable of producing up to 30 million pounds of titanium ingots per year.

The following table summarizes the source's potential to emit each regulated air pollutant from all emission units addressed by this Part 70 Operating Permit (OP).

Table 1. Potential to Emit (tons per year)

Pollutant	PM_{10}	$PM_{2.5}$	NO_X	CO	SO_2	VOC	HAPs (other)	HCl	Cl_2	COS	H_2SO_4	Total HAPs
Tons/year	81.45	68.65	32.38	282.19	30.46	7.84	3.08	7.22	2.84	0.31	3.78	17.23
Major Source Thresholds (Title V)	100	100	100	100	100	100	10/25[1]	10	10	10	10	25
Major Stationary Source Thresholds (PSD)	250	250	250	250	250	250	10/25[1]	10	10	10	10	25

[1]Ten tons for any individual HAP or 25 tons for combination of all HAPs.

DAQ requires sources to estimate their potential to emit greenhouse gases in terms of each individual pollutant (carbon dioxide, methane, nitrous oxide, hexafluoroethane, etc.) for a major source applicability analysis. This TSD includes those numbers.

The titanium sponge and ingot facility is subject to 40 CFR Part 60, Subpart Dc; 40 CFR Part 60, Subpart IIII; and 40 CFR Part 63, Subpart ZZZZ. The engines, which are subject to 40 CFR Part 60, Subpart IIII, may satisfy the requirements of 40 CFR Part 63, Subpart ZZZZ through compliance with 40 CFR Part 60, Subpart IIII, and 40 CFR Part 63, Subpart CCCCCC.

Based on the information submitted by the applicant and a technical review performed by DAQ staff, DAQ proposes the reopen for causes and minor revision of TIMET's Part 70 OP.

EPA has delegated to DAQ the authority to implement the requirements of the Part 70 permit program. Based on the information submitted by the applicant, supplemental information provided to DAQ, and a staff technical review, DAQ proposes renewal of the Titanium Metals Corporation Part 70 OP. Pursuant to Section 12.5.2 of the Clark County Air Quality Regulations (AQRs), all terms and conditions in the OP are federally enforceable unless explicitly stated otherwise.

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I. ACRONYMS

Table I-1: List of Acronyms and Abbreviations

Acronym	Term
AQR	Clark County Air Quality Regulation
Ar	argon
ATC	Authority to Construct
BACT	Best Achievable Control Technology
bhp	brake horsepower
CAA	Clean Air Act
CAAA	Clean Air Act Amendments (1990)
CAM	Compliance Assurance Monitoring
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CI	compression ignition
Cl_2	chlorine gases
CO	carbon monoxide
COMS	Continuous Opacity Monitoring System
COS	carbanyl sulfide
CSD	Continuous Sludge Dryer
DAQ	Clark County Department of Air Quality
EPA	U.S. Environmental Protection Agency
EU	emission unit
GDO	gasoline dispensing operation
GHG	greenhouse gas
gpm	gallons per minute
gr/kW	grams per kilowatt
H_2SO_4	sulfuric acid
HAP	hazardous air pollutant
HCl	hydrochloric acid
ICE	internal combustion engine
kW	kilowatt
LAER	Lowest Achievable Emission Rate
MACT	Maximum Achievable Control Technology
Mg	magnesium
$MgCl_2$	magnesium chloride
MMBtu	British thermal units (millions)
MW	megawatt
NAICS	North American Industry Classification System
NED	National Elevation Dataset
NESHAP	National Emission Standards for Hazardous Air Pollutants

Acronym	Term
NO_x	nitrogen oxides
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standard
OP	Operating Permit
PEMS	Predictive Emission Monitoring System
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
ppm	parts per million
ppmvd	parts per million, volumetric dry
PSD	Prevention of Significant Deterioration
PTE	potential to emit
QA	quality assurance
QA/QC	quality assurance/quality control
RATA	Relative Accuracy Test Audits
RICE	reciprocating internal combustion engine
RMP	risk management plan
SCC	Source Classification Codes
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	sulfur dioxides
TCS	toxic chemical substance
TDS	total dissolved solids
Ti	titanium
$TiCl_4$	titanium tetrachloride
TIMET	Titanium Metals Corporation
TiO_2	titanium dioxide
TSD	Technical Support Document
USGS	United States Geological Survey
VDP	Vacuum Distillation Process
VOC	volatile organic compound
WCF	Water Conservation Facility

II. SOURCE INFORMATION

A. General

Permittee:	Titanium Metals Corporation
Mailing Address:	P.O. Box 2128, Henderson, Nevada 89009
Responsible Official:	Alun Davies, Director of Operations
Environmental Contact:	Nettie Johnston, Environmental Engineer
Phone Number:	(702) 564-2544
Fax Number:	(702) 564-2689

B. Description of Process

TIMET is a major stationary source for CO, a synthetic minor source for PM_{10}, $PM_{2.5}$ and total HAPs, and a minor source for NO_x, SO_2, VOCs, and individual HAPs. Processes at the facility are described below. This source is not a categorical source. The federal definition for chemical processing says the NAICS starts with 325. This source starts with 331. This source will not be a secondary metal processing facility because its main function is the primary smelting and refining of nonferrous metals.

1. Storage of Raw Materials

Rutile ore is delivered to the TIMET facility by rail. When the rutile ore (about 97% TiO_2) arrives at the facility, it is unloaded onto underground conveyer belts and conveyed to chutes and silos located to the east of the Building J-2 warehouse. Currently, Silo #2 and Silo #3 are being used as a pass-through for the ore. The rutile ore is then conveyed to the Building J-2 warehouse, with 10% of the ore conveyed to two transfer bins and then into hoppers. The other 90% of the ore is stockpiled inside the building, and a front-end loader is used to load the ore into hoppers. All hoppers are then transported via forklift to the Chlorination Process.

Similarly, petroleum coke is stockpiled in the storage silos after it arrives by rail or truck. From the silo, the coke is conveyed to transfer bins and into hoppers, which are then transported to the Chlorination Process.

Alloys are received in steel drums and stored in Unit 13, then transported to Unit 11 (Blending). Diesel fuel and gasoline are also stored on-site in aboveground storage tanks.

The PTE emissions from this process are PM_{10} and $PM_{2.5}$.

2. Chlorination Process

In the chlorination process, the titanium in the rutile ore is converted to $TiCl_4$.
The raw materials in this process include rutile ore, petroleum coke, Cl_2, and compressed air. The Cl_2 is supplied as recovered gas from the Magnesium Recovery Process, and is supplemented by fresh ("Olin") chlorine from the underground pipeline. The rutile ore and coke are conveyed to this process from the raw materials warehouse.

Chlorination of the TiO_2 is achieved by passing Cl_2 through a mixture of rutile ore and excess coke at approximately 1,000ºC through one of four chlorinators:

$$TiO2 + 2Cl2 + 2C \rightarrow TiCl4 + 2CO$$
$$TiO2 + 2Cl2 + C \rightarrow TiCl4 + CO2$$

Gaseous crude $TiCl_4$ is collected at the top of the chlorination reaction vessel. Unreacted rutile ore and ash are removed from the gas stream by cyclones and collected as a solid waste. The crude $TiCl_4$, along with other metal chlorides, is liquefied in a series of condensing towers and collected in crude $TiCl_4$ storage tanks. This "chlorinator dust" is collected in a closed hopper, then transferred into roll-off bins kept under suction by a wet scrubber. Full roll-off bins are later transported to the on-site landfill for disposal.

In each of the four "chlorination trains," residual $TiCI_4$ in the off-gas from the final condenser is removed from the gas stream in a wash tower, where TiO_2 and HCl are generated from the reaction between water and $TiCl_4$. Residual acids and Cl_2 are scrubbed from the off-gas stream in a caustic scrubber tower. Off-gas from the four caustic scrubbers is directed to a common manifold, and particulates are removed by two venturi scrubbers. The caustic scrubber towers can emit directly to the atmosphere if the venture scrubber is not operating. The PM_{10}-scrubbed off-gas is ducted to the CO burner, then to the SO_2 scrubber, which removes the majority of the CO and SO_2 before exhausting to the atmosphere. If the scrubber is not operating, the CO burner can emit directly to the atmosphere. Operation of the SO_2 scrubber meets BACT requirements for SO_2 emissions from the CO boiler. The CO burner has a boiler section for heat recovery, and the steam is used in the Purification Process.

If the CO burner will be off-line for an extended period, the thermal oxidizer is available to burn the CO in the process gas. The exhaust from the thermal oxidizer is not routed through the SO_2 scrubber before discharging into the atmosphere. The CO burner has a semi-planned outage for approximately one week each time, and the CO burner is occasionally offline for unexpected reasons. The thermal oxidizer and a rental boiler are brought in to operate together while the CO burner is off-line for planned outages. The thermal oxidizer is also utilized if the CO burner is expected to be down for more than four hours during unplanned maintenance.

Chlorination reaction vessels occasionally must be rebuilt. Before one of these vessels is rebuilt, it is first cooled and emptied. After it is rebuilt, the vessel is slowly heated with a natural gas burner for curing. When the internal temperature reaches an acceptable level, petroleum coke and rutile ore are introduced to build a bed in the chlorinator. During the vessel heating process, the emissions bypass the primary and secondary condensers and are scrubbed for particulate. Depending on the number of chlorination vessels that require rebuilding, the heating and bed building process may require up to 30 days per year of operation.

The PTE emissions from this process are PM_{10}, $PM_{2.5}$, NO_x, VOCs, CO, SO_2, HCl, Cl_2, COS, and H_2SO_4.

3. Purification

The $TiCl_4$ from the chlorination process is transferred to crude feed tanks prior to purification. The crude $TiCl_4$ is first distilled (i.e., vaporized and condensed) to leave behind most of the impurities. Crude $TiCl_4$ is mixed with a proprietary chemical in a confidential process to remove trace impurities from the product stream. The mixture is then double-heated to remove first low-boiling, then higher-boiling chlorides through fractionation columns. The purified liquid $TiCl_4$ is

condensed and stored in tanks with a helium cover gas to prevent any contact with the air. A recycle stream of liquid $TiCl_4$ containing approximately 25 percent solids is diverted to the CSD. The $TiCl_4$ is vaporized from the solids, condensed, and recycled to crude feed tanks. The CSD solids are sluiced with effluent and sent to the WCF for neutralization prior to discharge to the lined settling ponds. $TiCl_4$-laden vapors from purification tanks, columns, and CSDs are combined and ducted into a heat exchanger and an OPW-wetted packed column before venting the scrubber off-gas at the PVS scrubber stack.

The PTE emissions from this process are PM_{10}, $PM_{2.5}$, NO_x, VOCs, CO, SO_2, and HCl.

4. Vacuum Distillation Process

VDP refers to the reduction of $TiCl_4$ into Ti sponge and the distillation of $MgCl_2$:

$$2\ Mg + TiCl_4 \rightarrow Ti + 2\ MgCl_2$$

In the VDP, a sealed reduction vessel is heated in an electric furnace and molten Mg metal, collected during the electrolytic reduction of MgCl2 to Mg metal, is added by transfer with inert gas pressure from a closed, insulated pot. TiCl4 is subsequently injected into the closed vessel and reacts with the molten Mg to form Ti metal sponge and MgCl2. Pressure is relieved periodically from the reactor to prevent excessive pressure build-up. The evacuated gases are discharged via a particulate knockout vessel to the emission control system. The VDP uses a closed system for tapping the molten $MgCl_2$. A transportable $MgCl_2$ vessel is coupled to the reduction vessel by piping. Valves are opened and the $MgCl_2$ is transferred to the transportable vessel by Ar gas pressurization. A fume shroud encloses the charge port and discharge piping at each reduction vessel. Particulate emissions resulting from the transfer of the $MgCl_2$ are collected via this shroud and ducted to the VDP scrubber, which is located outside the VDP building. Suction in the ductwork is maintained by the VDP scrubber fan. Particulates are scrubbed from the gas stream by high-pressure “reverse jets” and by packing, and are later filtered or flushed from the system.

Upon completion of the $TiCl_4$ reduction reaction, a second tank is connected to the reduction vessel to serve as a condenser. The reduction vessel is then heated as the condenser vessel is cooled, and a vacuum is drawn on the reduction vessel. Heating the reduction vessel causes Mg and $MgCl_2$ to vaporize and then condense in the condenser vessel. The titanium, now absent the $MgCl_2$ and any untreated Mg, remains in the reduction vessel as sponge. The condenser containing Mg and $MgCl_2$ is transferred to the Magnesium Recovery Process. Titanium sponge is cooled and then forced out of the reduction vessel for further processing.

The PTE emissions from this process are VOCs, CO, SO_2, HCl, and Cl_2.

5. Magnesium Recovery Process

Magnesium chloride separation is achieved by introducing the molten $MgCl_2$ into brick-lined electrolytic cells containing electrolytic salts. An electrical current is applied to separate the chlorine gas from the Mg. The chlorine is removed under vacuum, filtered, compressed, and sent to the Chlorination Process. The molten Mg is cast into ingots and returned to the VDP.

This process includes an emergency chlorine scrubber, along with a diesel-fired generator to operate the scrubber if an emergency occurs; such emergencies include any time the pressure in the chlorine gas line from the electrolytic cells to the chlorine gas compressor is higher than the safe set point. The emergency scrubber is also used whenever maintenance is required on the chlorine pipeline. When chlorine gas is diverted to the chlorine scrubber, the gas is 100% captured.

This process also includes one 4,500 gpm cooling tower with a TDS limit of 7,500 and a 0.001% drift rate.

The PTE emissions from this process are NO_x, VOCs, CO, SO_2, Cl_2, and H_2SO_4.

6. Blending Processes

The blending operations combine titanium sponge into larger blends. The proportioned volumes of sponge required for a particular blend are sent through blenders and splitters, then sent to the Melt Shop. This process is skipped for customers that purchase sponge.

The PTE emissions from this process are PM_{10} and $PM_{2.5}$.

7. Melt/Scrap Reclaim

After blending, the resultant feed material is combined with bulk purchased metal alloys, pressed into solid blocks, welded, melted in consumable electrode vacuum arc furnaces, and cast into ingots.

Scrap titanium delivered from various areas of the plant is cleaned and welded together for melting. The scrap is processed by torch cutting and shot blasting, welded into electrodes for melting, and then reused on-site in the Reclaim Process. Scrap can also be purchased from or sold to off-site customers.

The PTE emissions from this process are NO_x, VOCs, CO, and SO_2.

8. Miscellaneous Processes

The plant has various ancillary operations that have been grouped as "miscellaneous processes." These include a wheelabrator baghouse, an outdoor abrasive blasting area, gasoline and diesel aboveground storage tanks, paint shop operations, a cooling tower, and an emergency diesel generator.

The PTE emissions from this process are PM_{10}, $PM_{2.5}$, NO_x, VOCs, CO, and SO_2.

9. Water Conservation Facility

This process, commissioned in 2005, receives "spent caustic" and CSD slurry from the Chlorination Process and "other process water" from various facility areas. Air emissions result from wastewater neutralization, a chlorine scrubber, wastewater clarification and filtration, and two emergency generators.

The PTE emissions from this process are PM_{10}, $PM_{2.5}$, NO_x, VOCs, CO, SO_2, HCl, and Cl_2.

10. Groundwater Remediation System

This process is in place to remove various VOCs and HAPs from the groundwater. It involves two 8-tray air stripping units that releases the organic compounds to the atmosphere. One unit will be utilized as a backup to the other unit. These units will not operate simultaneously.

The PTE emissions from this process are VOCs.

11. Industrial Landfill

This landfill accepts waste from the facility. The waste is moved by a front-end loader and is covered by the requirements in the facility landfill permit.

The PTE emissions from this process are PM_{10} and $PM_{2.5}$.

C. Permitting History

TIMET is regulated by DAQ with a Title V permit. It is a major source for CO. The initial Part 70 OP was issued on May 20, 2004, and the permit was renewed on May 28, 2019 with five minor revisions.

D. Current Permitting Action

$PM_{2.5}$ Emissions

DAQ's $PM_{2.5}$ EF memo was utilized for each emission unit and activity related to processing, transporting, and/or sorting materials to incorporate the $PM_{2.5}$ emissions into the Title V Operating Permit. The current permit already addressed $PM_{2.5}$ emission for all emission units and processes except for paved haul roads. No open for cause was created for this source to address $PM_{2.5}$ emissions.

$PM_{2.5}$ emissions have been incorporated in this permitting action for the paved haul roads (EUs: B21 and LF02).

Reopen for Cause – August 9, 2021

The Department of Environment and Sustainability, Division of Air Quality (DAQ) has identified this source as possibly emitting 25 tons or more of actual emissions for oxides of nitrogen (NO_X) and/or volatile organic compounds (VOCs) in any calendar year. Clark County was required to implement Section 182(a)(3)(B) of the Clean Air Act (CAA) which requires all ozone nonattainment areas to have in place a program that requires emissions statements from stationary sources of NO_X and/or VOCs.

Section 12.9.1 of the Clark County Air Quality Regulations (AQRs) codifies this requirement for Clark County and states the following:

1. The Responsible Official of each Stationary Source that emits 25 tons or more of NO_X and/or VOC shall submit an Annual Emissions Statement (Statement) to the department for the previous calendar year.

2. Pursuant to CAA Section 182, the Statement must include all actual emissions for all NO_X and VOC emitting activities.

3. The Statement shall be submitted to and received by the department on or before March 31 of each year or other date, upon prior notice by the Control Officer, and shall include a certification that the information contained in the Statement is accurate to the best knowledge of the individual certifying the Statement.

The source's permit has been revised to include this requirement.

Reopen for Cause – September 2, 2021

This source is an existing major source that has a Title V operating permit. The Division of Air Quality (DAQ) is revising the permit pursuant to Sections 12.5.2.15 of the Clark County Air Quality Regulations (AQR), which maintain that the Control Officer may reopen and revise a permit "to assure compliance with the applicable requirements." This permit is revised to include recently promulgated fugitive dust requirements for stationary sources.

AQR Sections 92 (Fugitive Dust from Unpaved Parking Lots and Storage Areas) and 94 (Permitting and Dust Control for Construction Activities) were recently revised to address fugitive dust at stationary sources. The revised regulations became effective on August 17, 2021. Subsections 92.1(c) and 94.1.1(a) require that the control measures and stabilization standards therein be made enforceable by the terms and conditions of the stationary source permit.

The source's permit has been revised to include these fugitive dust requirements.

Minor Revision Application received 08/19/2021:

The addition of another groundwater remediation system (EU: GW02). Source proposed this second system for backup purposes during times of breakdown or maintenance of the existing groundwater remediation system (EU: GW01). Since this new system is a backup, there is no increase in PTE. Therefore this change is a minor revision.

Other changes made through this permitting action:

Revised paved haul road (EU: B21) calculation to correct a previous calculation error which shows a decrease in PM_{10} and $PM_{2.5}$ emissions after the correction.

E. Alternate Operating Scenario

None proposed.

III. SUMMARY OF EMISSION UNITS

This section lists the emission units covered by this operating permit.

Table III-1: List of Emission Units – Raw Material Storage and Handling

EU	Description	Rated Capacity	Manufacturer	SCC
A01	Coke Rail Car Unloading		TIMET design	30601301
A02	Coke Storage Silo #1		TIMET design	30601301
A03	Coke Storage Silo #2		TIMET design	30601301
A04	Rutile Ore Rail Car Unloading		TIMET design	30303012
A04a1	Rutile Belt Conveyor		TIMET design	30303012
A06	Rutile Transfer into Silo #2		TIMET design	30303012
A07	Rutile Transfer into Silo #3		TIMET design	30303012
A09	Rutile Transfer Bins (2) Offloading		TIMET design	30303012
A10	Rutile Transfer from Silos to Stockpile		TIMET design	30303012
A11	Rutile Transfer from Stockpile to Hoppers		TIMET design	30303012

Table III-2: List of Emission Units – Chlorination Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
B11	Chlorinator #81		TIMET design			30301201
B12	Chlorinator #82		TIMET design			30301201
B13	Chlorinator #83		TIMET design			30301201
B14	Chlorinator #84		TIMET design			30301201
B15	Chlorinator #85		TIMET design			30301201
B16	Chlorinator #86		TIMET design			30301201
B17	Chlorinator #87		TIMET design			30301201
B18	Chlorinator #88		TIMET design			30301201
B01	Caustic Scrubbing Tower #1 Vent (Tower #84)					30301201
B02	Caustic Scrubbing Tower #2 Vent (Tower #83)					30301201
B03	Caustic Scrubbing Tower #3 Vent (Tower #82)					30301201
B04	Caustic Scrubbing Tower #4 Vent (Tower #81)					30301201
B05	Venturi Scrubber Exhaust Stack (2 scrubbers, 4 blowers)	2,970 cfm total	Ducon Oriclone	Type VO, Size 42		30301201
B06a	CO Burner/Boiler exhausting through SO_2 Scrubber	18.5 MMBtu/hr	Clever Brooks	CB700350200	OL102330	10201402
B06b	SO_2 Scrubber	N/A	MECS	Dynaware		30301201
B09	Natural Gas Steam Boiler	6.7 MMBtu/hr	Kewanee	A3S-200-G11	AN861008	10200601
B10	Thermal Oxidizer (alternative control device for CO boiler)	6.0 MMBtu/hr	North American	2942-22-33AW	GS-2953	30301201
B19	Natural Gas Boiler – Rental Unit	Up to 14.7 MMBtu/hr	Varies	Varies	Varies	10200602
B20	Chlorinator Dust Loading in Roll-off Bins controlled by Wet Scrubber	1,700 cfm	New York Blower Company	H06909		30301299
B21	Truck Hauling of Chlorinator Dust Roll-offs in/out of facility	0.5 mile paved				

Table III-3: Insignificant Units and Activities – Chlorination Process

Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
Ammonia Refrigeration System (EU: M02)	2,900 lbs NH_3	Frick of York	RFX-101N	0407YFMNWHGA03 York - 154837	30301299

Table III-4: List of Emission Units – Purification Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
C01	Purification #2 PVS Scrubber	300 cfm				30301299
C04	Hot Oil Expansion Tank Vent					40301099
C05	Hot Oil Heater – South	1.0 MMBtu/hr	American Hydrotherm	Northern American		30590003
C05a	Hot Oil Heater – North	1.5 MMBtu/hr	Maxon			30590003
C07	Fugitive (valves, flanges, seals)					30301201
M15	Pure $TiCl_4$ Storage Tanks (10) West					30183001

Table III-5: Insignificant Units and Activities – Purification Process

Description	Rated Capacity	Manufacturer	Model #	Serial #
Natural Gas Hot Oil Heater	0.9 MMBtu/hr	HOH-American Hydrotherm	PowerFlame NPM30-12-120	5077

Table III-6: List of Emission Units – Vacuum Distillation Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
E01	VDP Scrubber (20 furnaces)		MECS	Dynaware		30301299
E02	General Arc Welding					30905000
E03	Emergency Engine; DOM: pre-1993	1,290 hp	Mitsubishi	S12-NPTA	10950	20300101
	Emergency Generator	825 kW	Marathon	574RSL403BWW	YB3877293	
E05a	VDP Cooling Tower – East	4,800 gpm	Phoenix	2FT-20.2/24.7-50-P5		38500101
E05b	VDP Cooling Tower – West	7,000 gpm	Evapco	24-924B		38500101
E06	VDP Fugitives Emissions from 42 Furnaces					30301220
E07	Electric Sponge Dryer	3,800 cfm	General Kinematics			30301299
	Sponge Dryer Cyclone		Airecon	12-1	L-5817	
M16	Pure $TiCl_4$ Storage Tanks, J-1 to J-5 Area - Wet Scrubber	100 acfm at 2.5 psig	Advanced Air Technologies	Orion	051091	30183001

Table III-7: Insignificant Units and Activities – Vacuum Distillation Process

Description	Rated Capacity	Manufacturer	Model #	Serial #
Diesel Storage Tank (EU: E04)	1,600 gallons	Mark Steel Corp.		

Table III-8: List of Emission Units – Magnesium Recovery Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
G01	Emergency Chlorine Scrubber		US Filter			30400660
G03	Magnesium Recovery Fugitives					30400660
G04a	Sulfuric Acid Tank West	7,500 gal				30187009
G04b	Sulfuric Acid Tank North	2,100 gal				30187009
G20	Cooling Tower	4,500 gpm	CTI			38500101
G21	Bi-Pole Cell Natural Gas Heaters – 19	1.5 MMBtu/hr	Hauck			10200601
	Cell 1-2; installed 11/12/2014 Cell 1-3; installed 10/15/2015 Cell 1-4; installed 07/12/2017 Cell 1-5; installed 09/15/2015 Cell 2-3; installed 12/15/2016 Cell 2-4; installed 10/10/2017 Cell 2-5; installed 05/26/2016 Cell 3-3; installed 06/17/2017 Cell 3-4; installed 11/09/2016 Cell 3-5; installed 02/23/2016 Cell 4-2; installed 08/13/2016 Cell 4-3; installed 10/13/2017 Cell 4-4; installed 04/06/2017 Cell 5-2; installed 05/07/2017 Cell 5-3; installed 02/01/2017 Cell 5-4; installed 05/20/2018 Cell 6-3; installed 04/21/2016 Cell 6-4; installed 10/05/2016 Cell 6-5; installed 08/15/2017					
G22	Emergency Engine; DOM: 2018	350 hp	Caterpillar	C9	S9PO1736	20300101
	Emergency Generator	250 kW		SD250	G5A09852	

Table III-9: List of Emission Units – Blending Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
H01	Sponge Blending System #1 – South Wall Unit 12		Ducon	Type SDW, size 10		30301299
H02	Sponge Blending System #2 - South Wall Unit 12		Ducon	Type SDW, size 10		30301299
H03	Sponge Blending System #3 – South Wall Unit 12		Ducon	Type SDW, size 10		30301299
H04	Sponge Blending System #4 – South Wall Unit 12		Ducon	Type SDW, size 10		30301299
H05	Splitter System – North Wall Unit 12		Ducon	Type SDW, size 10		30301299
H06	Blending Sampler Dust Collector – North Wall Unit 12		Ducon	Type SDW, size 10		30301299
H07	Sponge Blending System #7 – East Wall Unit 12		Murphy Rogers	MRC 985-D	1541	30301299

Table III-10: List of Emission Units – Melt/Reclaim Process

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
I01	Blending Press & Weld – Press Cyclone (north)		Ducon			30301299
I02	Blending Press & Weld – Weld-Splitter Cyclone (south)		Ducon			30301299
J01	Primary Melt Vacuum Pump and SEV System – 10 pumps					30301299
J02	Secondary Melt Vacuum Pump and SEV System – 5 pumps		SIHI Dry			30301299
J03[1]	Maintenance Stand: Furnace Leak Station – 1 pump		Tuthill			30301299
J04[1]	Crucible Leak Pump Down Station – 2 pumps		Kinney			30301299
J05[1]	Double Melt Weld Chamber - 1 pump		Kinney			30301299
J06[1]	Primary Weld Chamber – 2 pumps		Bush			30301299
K01	Ingot Preparation - Torch Cutting		American Air Filter	Model C, size 1296	AT-60005	30904600
L02	Scrap & Reclaim - Crusher/Torch Cutting		Wheelabrator Frye	A130289		30904600
L03	Scrap & Reclaim - Crusher/Torch Cutting		Wheelabrator Frye			30904600
L04	Unit 8 Alloy Cyclone		Ducon			30301299

Table III-11: List of Emission Units – Miscellaneous Processes

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
M01	Unit 7 Wheelabrator Baghouse		US Filter	A14-2515, 2516		30900205
M04	Outdoor Abrasive Blast Area		Donaldson Torit			30200201
M07	Above Ground Gasoline Storage Tank, J-2	500 gal				20200106
M13	Paint Shop					40200710
M14	Cooling Tower (west of WCF)	4,500 gpm	BAC- Pritchard	4392-2		38500101
M17	Emergency Engine; DOM: May 2011	51 hp	Generac	A2400T-GEN	TN4T00136	20300101
	Emergency Generator	15 kW		SD015	2110482	
M18	Material Management Building for maintenance activities					30301299
M19	Maintenance activities (Portable Scrubber)	10,000 cfm	Club-2550			30301299
M20	Maintenance activities (Portable Scrubber)	10,000 cfm	Club-3000			30301299

Table III-12: Insignificant Units and Activities – Miscellaneous Process

Description	Make	Model #	Serial #
Diesel Above Ground Storage Tank – 500 gallons (EU: M08)			
Laboratory Fume Hoods, S-11 East and West (EU: M09)			
Laboratory Fume Hoods, K-52 East and South (EU: M10)			

Table III-13: List of Emission Units – Wastewater Conservation Facility

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
W01	Wastewater Neutralization	130 gal/min				30382599
W02	WCF Chlorine Scrubber	1,800 ft^3/min	Viron International	VCB-1112-BD-FRP-9-CW45-SHP-TEFC-PREM-460-3-60	12764	30382599
W03	Wastewater Clarification/Filtration	130 gal/min				30382599
W04	Emergency Engine; DOM: May 2008	35 hp	John Deere	4024TF281	PE4024R005122	20300101
	Emergency Generator	25 kW	Generac	9781650200	2098264	
W05	Emergency Engine; DOM: February 2016	217 hp	Caterpillar	469-6214	E5500302	20300101
	Emergency Generator	161.6 kW		D125-8	L7C00217	

Table III-14: Insignificant Units and Activities – Wastewater Conservation Facility

Description	Make	Model #	Serial #
Caustic Storage Tank (TK-04A) – 21,879 gallons	Amber Steel		
Caustic Storage Tank (TK-04B) – 21,879 gallons	Amber Steel		
Dilute Caustic Storage Tank (TK-05A) – 11,640 gallons	ID Industries		
Dilute Caustic Storage Tank (TK-05B) – 11,640 gallons	ID Industries		

Table III-15: List of Emission Units – Groundwater Remediation System

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
GW01	Groundwater remediation system, 8-tray air stripping unit	100 gpm, 850 cfm flow rate	QED	EZ-16.4SS		30382599
GW02[1]	Groundwater remediation system, 8-tray air stripping unit	100 gpm, 850 cfm flow rate	QED	EZ-16.4SS		30382599

[1]New.

Table III-16: List of Emission Units – Industrial Landfill

EU	Description	Rated Capacity	Manufacturer	Model #	Serial #	SCC
LF01	Landfill Maintenance	3.2 acres				50100402
LF02	Haul Road - Paved	0.25 miles RT				30301299

The units or activities listed in in Table III-3, 5, 7, 12, and 14 are present at this source, but are deemed insignificant.

The control devices covered by this operating permit are described with their respective processes.

IV. EMISSIONS INFORMATION

A. Source-wide PTE

TIMET is a major stationary source for CO, a synthetic minor source for PM_{10}, $PM_{2.5}$ and total HAPs, and a minor source for NO_x, SO_2, VOCs, and individual HAPs.

Table IV-A-1: Source-wide PTE (tons per year)

PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAPs	HCl	Cl_2	COS	H_2SO_4	Total HAPs
81.45	68.65	32.38	282.19	30.46	7.84	3.08	7.22	2.84	0.31	3.78	17.23

The table below shows the facility PTE prior to this action. There is a decrease in PM_{10} and $PM_{2.5}$ emissions due to the recalculation of the Chlorination haul roads. The slight decrease in HCl and total HAP emission is due to the correction of a previous copy error.

B. Allowable Emissions Calculations

The following tables summarize the allowable PTE for all processes.

Table IV-B-1: All Processes

Process	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	HCl	Cl_2	COS	H_2SO_4	Total HAPs
Raw Materials Storage and Handling	2.89	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chlorination	26.00	19.82	10.25	269.03	30.32	0.19	0.07	5.08	0.74	0.31	3.77	9.97
Purification	6.02	5.43	1.09	0.89	0.02	0.44	0.02	1.41	0.00	0.00	0.00	1.43
Vacuum Distillation	27.11	24.04	7.74	1.77	0.01	0.23	0.01	0.73	0.35	0.00	0.00	1.16
Magnesium Recovery	8.01	7.21	12.79	10.36	0.08	0.68	0.25	0.00	1.45	0.00	0.01	1.71
Blending	2.10	1.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melt/Reclaim	4.26	3.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous	4.06	3.14	0.09	0.03	0.01	5.79	2.49	0.00	0.00	0.00	0.00	2.49
Wastewater Reclamation	0.02	0.02	0.42	0.11	0.02	0.16	0.02	0.00	0.30	0.00	0.00	0.32
Groundwater Remediation	0.00	0.00	0.00	0.00	0.00	0.35	0.22	0.00	0.00	0.00	0.00	0.22
Landfill	0.98	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Totals:	**81.45**	**68.65**	**32.38**	**282.19**	**30.46**	**7.84**	**3.08**	**7.22**	**2.84**	**0.31**	**3.78**	**17.23**

Table IV-B-2: PTE (pounds per hour) – Chlorination Process

EU	Conditions	NO_x	CO	SO_2	Cl_2	HCl	COS	H_2SO_4
B06a,b	1 hour	2.04	60.80	6.90	0.17	1.16	0.07	0.86
B10	1 hour	1.14	0.45	27.66	1.00	0.03	0.07	0.09
B19	1 hour	0.54	0.55	0.00	0.00	0.00	0.00	0.00

Table IV-B-3: PTE (pounds per hour) – Upset/Breakdown Emissions (Chlorination)

EU	Conditions	NO_x	CO	SO_2	HCl	Cl_2	COS	H_2SO_4
B01	1 hour	0.05	532.73	0.01	0.34	0.04	9.12	0.01
B02	1 hour	0.05	532.73	0.01	0.34	0.04	9.12	0.01
B03	1 hour	0.05	532.73	0.01	0.34	0.04	9.12	0.01
B04	1 hour	0.05	532.73	0.01	0.34	0.04	9.12	0.01
B05	1 hour	0.22	2,029.00	0.01	1.36	0.16	36.48	0.01
B06a	1 hour	0.24	60.80	27.66	0.82	0.08	0.07	1.82
B10	1 hour	1.14	0.45	27.66	0.14	0.02	0.07	1.12

Table IV-B-4: PTE (tons per year) – Excess Emissions[1]

EU	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	HCl	Cl_2	COS	H_2SO_4
All	0.08	0.06	0.19	39.17	6.21	0.02	0.05	0.70	0.15

[1]Supplemental information submitted 01/31/2019 with proposed language for excess emissions for CO in pounds. DAQ used this information for the reporting of excessive emissions.

Table IV-B-5: PTE (pounds per hour) – Purification Process

EU	Conditions	PM_{10}	HCl
C01	1 hour	1.30	0.22

NOTE: Any operations not vented to the CO boilers are considered deviations from normal permitted operations. Processes vented to the thermal oxidizer that exceed the emissions listed in Table IV-B-4 have to be reported as excess emissions.

C. Operational Limits

The addition of the ground water treatment system required a limitation to be added to the permit to indicate the units (EUs: GW01 and GW02) would share 8,760 hours and not be in operation simultaneously.

No other new operation limitation is added with this permitting action. All existing operation limits remains.

D. Control Technology and Continuous Emissions Monitoring System

AQR Section 92 and 94 dust control conditions and emission limits have been incorporated in this permit. All existing control requirements and continuous monitoring within the different process sections of this permit remain the same.

E. Monitoring

The permittee shall monitor operations of the new groundwater remediation system.

F. Performance Testing

No changes since the previous renewal issued on May 28, 2019.

G. RACT Analysis

No RACT analysis is required for this permitting action.

H. Public Participation

Pursuant to AQR 12.5.2.17, the Control Officer should provide for public notice, comment, and an opportunity for a hearing on initial permit issuances, significant revisions, reopenings for cause, and renewals in accordance with the procedures outlined in the regulation. Given the broad range of changes that can be addressed through a reopening of the permit, including those that typically do not require public participation, DAQ relied on the other criteria for public participation to ascertain whether it should be initiated for this reopening of the permit. As the updates addressed in this reopening qualify as neither an initial permit issuance nor a renewal of the Title V permit, the criteria for a significant permit revision was used to determine whether public participation is warranted. The changes addressed in this reopening of the permit do not meet any criterion for a significant revision that would otherwise require public participation. Instead, the changes addressed in this reopening introduce permit conditions that are more stringent than those in the current permit and should not be a matter of public objection. Therefore, considering the stringency of the new permit conditions, the cost of a public notice publication, and the delay in permit issuance relating to a public comment period, initiation of another public participation process cannot be adequately supported.

V. REGULATORY REVIEW

A. Local Regulatory Requirements

No changes since the previous renewal issued on May 28, 2019.

B. Federally Applicable Regulations

No changes since the previous renewal issued on May 28, 2019.

VI. COMPLIANCE

A. Compliance Certification

Recordkeeping requirements are to be met for all limitations specified in this permit.

1. Requirements for Reporting: AQR 12.5.2.8, "Requirements for Compliance Certification"

a. Regardless of the date of issuance of this Part 70 OP, the permittee shall follow the schedule for report submittal to DAQ in Table V-A-1.

Table V-A-1: Reporting Schedule

Required Report	Applicable Period	Due Date
Semiannual report for 1st half of the year	January, February, March, April, May, June	July 30 each year[1]
Semiannual report for 2nd half of year; any additional annual records required	July, August, September, October, November, December	January 30 each year[1]
Annual Compliance Certification	Calendar year	January 30 each year[1]
Annual Emission Inventory Report	Calendar year	March 31 each year[1]
Annual Emission Statement[2]	Calendar year	March 31 each year[1]
Notification of Malfunctions, Startup, Shutdowns, or Deviations with Excess Emission	As required	Within 24 hours of the permittee learns of the event
Report of Malfunctions, Startup, Shutdowns, or Deviations with Excess Emission	As required	Within 72 hours of the notification
Deviation Report without Excess Emissions	As required	Along with semiannual reports[1]
Excess Emissions that Pose a Potential Imminent and Substantial Danger	As required	Within 12 hours of the permittee learns of the event
Performance Testing Protocol	As required	No less than 45 days, but no more than 90 days, before the anticipated test date[1]
Performance Testing	As required	Within 60 days of the end of the test[1]
RATA	As required	Within 60 days of end of test[1]

[1]If this date falls on a Saturday, Sunday, or federal or state holiday, submittals are due on the next regularly scheduled business day.
[2] Required only for stationary sources that emit 25 tons or more of nitrogen oxide (NO_X) and/or emit 25 tons or more of volatile organic compounds (VOC) during a calendar year.

The regulation also requires the following:

b. A statement of methods used for determining compliance, including a description of monitoring, recordkeeping, and reporting requirements and test methods.

c. A schedule for submission of compliance certifications during the permit term.

d. A statement indicating the source's compliance status with any applicable enhanced monitoring and compliance certification requirements of the CAA.

B. Compliance Summary

No changes since the previous renewal issued on May 28, 2019.

VII. EMISSION REDUCTION CREDITS (OFFSETS)

The source is subject to offset requirements in accordance with AQR 59. Offset requirements and associated mitigation are pollutant-specific.

VIII. ADMINISTRATIVE REQUIREMENTS

No changes since the previous renewal issued on May 28, 2019.

IX. MODELING

TIMET is a major source in Hydrographic Area 212 (Las Vegas Valley). Permitted emission units include titanium production processes. Since minor source baseline dates for NO_X (October 21, 1988) and SO_2 (June 29, 1979) have been triggered, Prevention of Significant Deterioration (PSD) increment analysis is required.

Air Quality modeled the source using AERMOD to track the increment consumption. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (2011 to 2015) of meteorological data from the McCarran Station were used in the model. United States Geological Survey (USGS) National Elevation Dataset (NED) terrain data was used to calculate elevations. Table IX-1 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table IX-1: PSD Increment Consumption

Pollutant	Averaging Period	Source's PSD Increment Consumption ($\mu g/m^3$)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO_2	3-hour	273.91[1]	680371	3990359
SO_2	24-hour	79.41[1]	680354	3990456
SO_2	Annual	2.88	680756	3991157
NO_X	Annual	7.29	680896	3991058

[1] Highest Second High Concentration.

X. ATTACHMENTS: ALL PROCESS CALCULATIONS

Chlorination Process

EU	Conditions	PM_{10}	$PM_{2.5}$
B21	500 VMT/yr	0.04	0.02
	Total	**0.04**	**0.02**

Groundwater Remediation System (tons per year)

EU	Rated Capacity	Conditions	VOC	HAP
GW01	100 gpm	8,760 hrs/yr	0.35	0.22
GW02	100 gpm			
		Total	**0.35**	**0.22**

Landfill (tons per year)

EU	Conditions	PM_{10}	$PM_{2.5}$
LF01	3.2 Acres	0.97	0.15
LF02	150 VMT/yr	0.01	0.01
	Total	**0.98**	**0.16**

Landfill (tons per year)

EU	Throughput	$PM_{2.5}$ EF	PM_{10} EF	Control Method	$PM_{2.5}$ (ton/hr)	PM_{10} (ton/yr)
LF01	3.2 acres	0.25 lb/acre-day	1.66 lb/acre-day	--	0.15	0.97

Landfill (tons per year)

EU	Description	Throughput	$PM_{2.5}$ EF	PM_{10} EF	Control Method	$PM_{2.5}$ (ton/hr)	PM_{10} (ton/yr)
LF02	Landfill haul roads	150 VMT/year	1.14 lb/VMT	7.57 lb/VMT	98.0% control	0.01	0.01
					$PM_{2.5}$/PM_{10} Total	**0.01**	**0.01**

Chlorination Haul Roads

EU	Throughput	$PM_{2.5}$ EF	PM_{10} EF	Control Method	$PM_{2.5}$ (ton/hr)	PM_{10} (ton/yr)
B21	500 VMT/year	1.14 lb/VMT	7.57 lb/VMT	98.0% Control	0.02	0.04

Applicability/Source Determination:

Process	PM_{10}	$PM_{2.5}$	NO_x	CO	SO_2	VOC	HAP	HCl	Cl_2	COS	H_2SO_4	Total HAP
Raw Materials Storage and Handling	9.6	8.96	0	0	0	0	0	0	0	0	0	0
Chlorination	25.96	19.80	10.25	269.03	30.32	0.19	0.07	5.08	0.74	0.31	3.77	9.97
Purification	56.95	51.54	1.09	0.89	0.02	0.44	0.02	10.04	0.00	0.00	0.00	10.06
Vacuum Distillation	27.11	24.04	7.74	1.77	0.01	0.23	0.01	1.45	0.70	0.00	0.00	2.16
Magnesium Recovery	8.01	7.21	12.79	10.36	0.08	0.68	0.25	0.00	1.45	0.00	0.01	1.71
Blending	210.02	188.87	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Melt/Reclaim	177.59	159.48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Miscellaneous	370.21	332.98	0.09	0.03	0.01	5.79	2.49	0.00	0.00	0.00	0.00	2.49
Wastewater Reclamation	0.02	0.02	0.42	0.11	0.02	0.16	0.02	0.00	0.30	0.00	0.00	0.32
Groundwater Remediation	0.00	0.00	0.00	0.00	0.00	0.35	0.22	0.00	0.00	0.00	0.00	0.22
IA-Heater	0.03	0.03	0.39	0.32	0.01	0.02	0.01	0.00	0.00	0.00	0.00	0.01
IA-Tank	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
IA-Tank	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
IA-Fume Hoods	0.05	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
IA-WCF	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
Total	**885.55**	**792.96**	**32.77**	**282.51**	**30.47**	**7.96**	**3.09**	**16.57**	**3.19**	**0.31**	**3.78**	**26.94**

For all other emissions not identified in this TSD and for a determination for the OP, see 00019_20190528_TSD.