Missouri Department of NATURAL RESOURCES
dnr.mo.gov
Michael L. Parson, Governor
Carol S. Comer, Director

DEC 0 4 2018

Mr. Sergio Valdez
Production Manager
Phoenix Manufacturing, LLC
500 Industrial Drive
Glasgow, MO 65254

RE: New Source Review Permit - Project Number: 2018-06-030

Dear Mr. Valdez:

Enclosed with this letter is your permit to construct. Please study it carefully and refer to Appendix A for a list of common abbreviations and acronyms used in the permit. Also, note the special conditions on the accompanying pages. The document entitled, "Review of Application for Authority to Construct," is part of the permit and should be kept with this permit in your files. Operation in accordance with these conditions, your new source review permit application and with your operating permit is necessary for continued compliance. The reverse side of your permit certificate has important information concerning standard permit conditions and your rights and obligations under the laws and regulations of the State of Missouri.

This permit may include requirements with which you may not be familiar. If you would like the department to meet with you to discuss how to understand and satisfy the requirements contained in this permit, an appointment referred to as a Compliance Assistance Visit (CAV) can be set up with you. To request a CAV, please contact your local regional office or fill out an online request. The regional office contact information can be found at the following website: http://dnr.mo.gov/regions/. The online CAV request can be found at http://dnr.mo.gov/cav/compliance.htm.

If you were adversely affected by this permit decision, you may be entitled to pursue an appeal before the administrative hearing commission pursuant to Sections 621.250 and 643.075.6 RSMo. To appeal, you must file a petition with the administrative hearing commission within thirty days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed; if it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the administrative hearing commission, whose contact information is: Administrative Hearing Commission, United States Post Office Building, 131 West High Street, Third Floor, P.O. Box 1557, Jefferson City, Missouri 65102, phone: 573-751-2422, fax: 573-751-5018, website: www.oa.mo.gov/ahc.

If you have any questions regarding this permit, please do not hesitate to contact Ryan Schott, at the Department of Natural Resources' Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or at (573) 751-4817. Thank you for your attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM

Susan Heckenkamp
New Source Review Unit Chief

SH:rsj

Enclosures

c: Northeast Regional Office
PAMS File: 2018-06-030

Permit Number: 122018-002

MISSOURI
DEPARTMENT OF
NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: 122018-002

Project Number: 2018-06-030
Installation Number: 089-0001

Parent Company: Turnkey Processing Solutions

Parent Company Address: 28369 Davis Parkway #407, Warrenville, IL 60555

Installation Name: Phoenix Manufacturing, LLC

Installation Address: 500 Industrial Drive, Glasgow, MO 65254

Location Information: Howard County (Landgrant 2456)

Application for Authority to Construct was made for:
The installation of a steel tank and structure fabrication facility. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

☐ Standard Conditions (on reverse) are applicable to this permit.

☑ Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

Director or Designee
Department of Natural Resources

DEC 04 2018

Effective Date

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Enforcement and Compliance Section of the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Enforcement and Compliance Section of the Department's Air Pollution Control Program of the anticipated date of startup of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department's regional office responsible for the area within which you are located within 15 days after the actual startup of this (these) air contaminant source(s).

A copy of the permit application and this permit and permit review shall be kept at the installation address and shall be made available to Department's personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit using the contact information below.

Contact Information:
Missouri Department of Natural Resources
Air Pollution Control Program
P.O. Box 176
Jefferson City, MO 65102-0176
(573) 751-4817

The regional office information can be found at the following website:
http://dnr.mo.gov/regions/

SPECIAL CONDITIONS:
The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted to the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Phoenix Manufacturing, LLC
Howard County (Landgrant 2456)

1. $PM_{2.5}$ Emission Limitation
   A. Phoenix Manufacturing, LLC shall emit less than 10.0 tons of $PM_{2.5}$ in any consecutive 12-month period from the entire installation, which includes the following equipment:

1)	Plasma Cutting	EU-01
2)	Grinding/Sanding	EU-02
3)	Welding	EU-03
4)	Abrasive Blasting	EU-04
5)	Spray Coating	EU-05/EU-06
6)	Haul Roads	EU-07

   B. Attachment A or an equivalent form, such as an electronic form, approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Condition 1.A.

2. Capture Device Requirement – Blast Booth
   A. Phoenix Manufacturing, LLC shall capture emissions from abrasive blasting (EU-04) using a blast booth, as specified in the permit application.

   B. All doorways into the booth shall be closed during operation, and all fresh air vents shall be equipped with visual indicators, such as streamers, that show air flow into the booth.

3. Control Device Requirement – Baghouse
   A. Phoenix Manufacturing, LLC shall control emissions from abrasive blasting (EU-04) using a baghouse, as specified in the permit application.

   B. The baghouse shall be operated and maintained in accordance with the manufacturer's specifications. The baghouse shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. This gauge or meter shall be located such that Department of Natural Resources' employees may easily observe it.

   C. Replacement filters for the baghouse shall be kept on hand at all times. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

SPECIAL CONDITIONS:
The permittee is authorized to construct and operate subject to the following special conditions:

D. Phoenix Manufacturing, LLC shall monitor and record the operating pressure drop across the baghouse at least once every 24 hours while the equipment is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

4. Capture Device Requirement – Paint Booth

A. Phoenix Manufacturing, LLC shall capture emissions from spray coating (EU-05) using a paint booth, as specified in the permit application.

B. All doorways into the booth shall be closed during operation, and all fresh air vents shall be equipped with visual indicators, such as streamers, that show air flow into the booth.

5. Control Device Requirement – Paint Booth Filters

A. Phoenix Manufacturing, LLC shall control emissions from spray coating (EU-05) using paint booth filters, as specified in the permit application.

B. The filters shall be operated and maintained in accordance with the manufacturer's specifications.

C. Replacement filters shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).

D. Phoenix Manufacturing, LLC shall maintain a copy of the filter manufacturer's performance warranty on site.

E. Phoenix Manufacturing, LLC shall monitor and record the operating pressure drop across the filters at least once every 24 hours while the equipment is operating. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

F. Phoenix Manufacturing, LLC shall maintain an operating and maintenance log for the paint booths, which shall include the following:

1) Incidents of malfunction, with impact on emissions (tons), duration of event, probable cause, and corrective actions; and
2) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.

6. Paint Gun Usage Restriction

Phoenix Manufacturing, LLC shall not use more than two (2) spray guns at a time in the paint booth.

SPECIAL CONDITIONS:
The permittee is authorized to construct and operate subject to the following special conditions:

7. Record Keeping and Reporting Requirements

A. Phoenix Manufacturing, LLC shall maintain all records required by this permit for not less than five years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request. These records shall include SDS for all materials used.

B. Phoenix Manufacturing, LLC shall report to the Air Pollution Control Program's Compliance/Enforcement Section at P.O. Box 176, Jefferson City, MO 65102 or by email at AirComplianceReporting@dnr.mo.gov, no later than 10 days after the end of the month during which any record required by this permit shows an exceedance of a limitation imposed by this permit.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW
Project Number: 2018-06-030
Installation ID Number: 089-0001
Permit Number: 122018-002

Installation Address:
Phoenix Manufacturing, LLC
500 Industrial Drive
Glasgow, MO 65254
Howard County (Landgrant 2456)

Parent Company:
Turnkey Processing Solutions
28369 Davis Parkway #407
Warrenville, IL 60555

REVIEW SUMMARY

- Phoenix Manufacturing, LLC has applied for authority to install a steel tank and structure fabrication facility.
- The application was deemed complete on July 3, 2018.
- HAP emissions are expected from the proposed equipment. HAPs of concern from this process include chromium, cobalt, ethyl benzene, lead, manganese, methyl isobutyl ketone, nickel, and xylene.
- None of the NSPS or NESHAPs apply to the installation.
- 40 CFR 63, Subpart MMMM – *National Emission Standard for Hazardous Air Pollutants for Surface Coating of Miscellaneous Metal Parts and Products* does not apply because the installation is not a major source for HAPs.
- 40 CFR 63, Subpart XXXXXX – *National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Nine Metal Fabrication and Finishing Source Categories* applies to the installation.
- Fabric filters and a baghouse are being used to control particulate emissions from the equipment in this permit.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM are above the de minimis level but below the major source level. Potential emissions of all other pollutants are conditioned below de minimis levels.
- This installation is located in Howard County, an attainment area for all criteria pollutants.

- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.

- Although PM emissions exceed the de minimis level, ambient air quality modeling was not performed because no modeling standards currently exist for PM.

- Emissions testing is not required for the equipment as a part of this permit. Testing may be required as part of other state, federal, or applicable rules.

- No Operating Permit is required for this installation. Although PM emissions are above the de minimis level, operating permit requirements are not triggered.

- Approval of this permit is recommended with special conditions.

INSTALLATION DESCRIPTION

Phoenix Manufacturing, LLC operates a steel tank and structure manufacturing facility at 500 Industrial Drive in Glasgow, Missouri. This site was previously occupied by another manufacturing facility, Standard Havens, Inc., which installed an air blast room and structural descaling machine under Construction Permit No. 1090-007. No permits have been issued to Phoenix Manufacturing, LLC by the Air Pollution Control Program.

PROJECT DESCRIPTION

Phoenix Manufacturing, LLC is obtaining a construction permit for all active equipment at the installation, which has not previously been permitted. Equipment and operations include plasma cutting (EU-01), grinding/sanding (EU-02), welding (EU-03), abrasive blasting (EU-04), and spray coating (EU-05 & EU-06). The facility has one haul road (EU-07) that is used to transport raw materials onsite and finished product offsite.

The process for manufacturing steel structures is as follows: Steel plates arrive at the facility and are cut to size with the plasma cutter. The steel then undergoes grinding/sanding to prepare the parts for welding. After welding the steel into a final structure (e.g. storage tank), it is cleaned and blasted with steel shot. Then, the structure is spray painted, yielding the final product. Due to the variability of the types of structures produced and the custom nature of operations, an overall maximum production rate was not determined; however, maximum design rates for each individual process were used in determining potential emissions.

EMISSIONS/CONTROLS EVALUATION

PM, NO_x, and HAP emissions from plasma cutting were calculated using emission factors taken from the Swedish Institute of Production Engineering Research document: *Emissions of Fume, Nitrogen Oxide, and Noise in Plasma Cutting of Stainless and Mild*

Steel (March 1994) and the TSD Appendix document: *Potential to Emit – Emissions Inventory for Thurston Manufacturing Company, Draft Synthetic Minor Source Permit* (June 2014). Only mild steel will be cut in EU-01, and it was assumed that all steel plates will be between ½ inch (12.7 mm) and 1 inch (25.4 mm) thick. The worst case emission were assumed, which for PM is when the steel is the thinnest and for NO_x when the steel is the thickest.

PM_{10} and $PM_{2.5}$ emissions from plasma cutting were calculated using the particle size distribution taken from the Hemispheric Center for Environmental Technology, Florida International University document: *Size Distribution and Rate Production of Airborne Particulate Matter Generated During Metal Cutting* (January 2001). HAP constituent percentages of the metal were taken from the highest values listed on various SDS for mild steel.

PM, PM_{10}, and $PM_{2.5}$ emissions from grinding/sanding were calculated using emission factors taken from WebFIRE under SCC 30400340. Because the amount of grinding/ sanding required is different for each steel structure, a maximum design rate of 0.7 tons per hour was estimated. Although not exactly representative of actual operations, this value is approximately equivalent to grinding 60 feet of ½ inch thick steel per hour.

PM and HAP emissions from gas metal arc welding (GMAW) were calculated using emission factors taken from AP-42 Section 12.19 *Electric Arc Welding* (January 1995). Phoenix Manufacturing, LLC will be consuming up to 47 pounds of ER70S-6 welding wire per hour, using an argon/carbon dioxide shielding gas blend. It was assumed that all emitted PM is $PM_{2.5}$.

PM emissions from abrasive blasting were calculated using emission factors taken from AP-42 Section 13.2.6 *Abrasive Blasting* (October 1997). The blasting equipment is capable of cycling 100 pounds of steel shot per hour in the blast booth and is controlled by a baghouse. It was assumed that all emitted PM is $PM_{2.5}$.

Spray coating operations normally occur in the paint booth (EU-05), which is a large enclosed structure with a strong fan that pulls overspray emissions through the paint booth filters. Including total paint/dry time, two paint guns can apply up to 2.2 gallons of coating per hour in the paint booth. In the infrequent event that a manufactured steel structure is too large to fit in the paint booth, the unfinished part is moved to the warehouse where it is spray coated without any emission control (EU-06). One paint gun can apply up to 1.1 gallons of coating per hour in the warehouse. It was conservatively assumed that 10% of spray coating on an annual basis will take place in the warehouse.

PM, VOC, and HAP emissions from spray coating were calculated using mass balances. The solids content, volatile content, and HAP constituents of each coating were obtained from the SDS, and the coatings with the highest potential emissions were conservatively assumed to be used at all times (excluding accelerators and solvents). The solids transfer efficiency of the spray guns is 50% [taken from the spray coating section of the APTI document, *Sources and Control of Volatile Organic Air Pollutants* (November 2002)] and the paint booth filters were taken to have a 95% control

efficiency for particulates. It was assumed that 100% of VOCs and HAPs are emitted to the atmosphere and all emitted PM is $PM_{2.5}$.

PM, PM_{10}, and $PM_{2.5}$ emissions from the haul road were calculated using the methods found in AP-42 Section 13.2.2 *Unpaved Roads* (November 2006).

The following table provides an emissions summary for this project. The installation has not been permitted since 1990; therefore, existing potential emissions are unknown. The installation has not submitted an EIQ since 2001; therefore, actual emissions are unknown. Potential emissions of the project represent the potential of the equipment, assuming continuous operation (8,760 hours per year).

Table 1: Emissions Summary (tons per year)

Pollutant	Regulatory *De Minimis* Levels/SMAL	Existing Potential Emissions	Existing Actual Emissions	Potential Emissions of the Project	Conditioned Potential Emissions
PM	25.0	N/D	N/D	81.94	45.84
PM_{10}	15.0	N/D	N/D	24.78	13.86
$PM_{2.5}$	10.0	N/D	N/D	17.87	<10.0
SO_x	40.0	N/D	N/D	N/A	N/A
NO_x	40.0	N/D	N/D	6.29	3.52
VOC	40.0	N/D	N/D	31.96	17.88
CO	100.0	N/D	N/D	N/A	N/A
Chromium	10.0/5	N/D	N/D	0.26	0.14
Chromium (VI)	10.0/0.002	N/D	N/D	$5.59x10^{-5}$	$3.31x10^{-5}$
Cobalt	10.0/0.1	N/D	N/D	$2.06x10^{-3}$	$1.15x10^{-3}$
Ethyl Benzene	10.0/10	N/D	N/D	1.38	0.77
Lead	10.0/0.01	N/D	N/D	0.02	0.01
Manganese	10.0/0.8	N/D	N/D	0.78	0.44
Methyl Isobutyl Ketone	10.0/10	N/D	N/D	5.23	2.93
Nickel	10.0/1	N/D	N/D	0.13	0.07
Xylene	10.0/10	N/D	N/D	4.40	2.46
Total HAPs	25.0	N/D	N/D	12.19	6.82

SMAL = Screening Model Action Level; N/D = Not Determined; N/A = Not Applicable

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of PM are above the de minimis level but below the major source level. Potential emissions of all other pollutants are conditioned below de minimis levels.

APPLICABLE REQUIREMENTS

Phoenix Manufacturing, LLC shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved.

GENERAL REQUIREMENTS

- *Start-Up, Shutdown, and Malfunction Conditions,* 10 CSR 10-6.050

- *Submission of Emission Data, Emission Fees and Process Information,* 10 CSR 10-6.110
  - Per 10 CSR 10-6.110(4)(B)2.B(II) and (4)(B)2.C(II) a full EIQ is required for the first full calendar year the equipment (or modifications) approved by this permit are in operation.

- *Restriction of Emission of Odors*, 10 CSR 10-6.165

- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170

- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220

SPECIFIC REQUIREMENTS

- *MACT Regulations*, 10 CSR 10-6.075
  - *National Emission Standards for Hazardous Air Pollutants: Area Source Standards for Nine Metal Fabrication and Finishing Source Categories* – 40 CFR 63, Subpart XXXXXX

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, it is recommended that this permit be granted with special conditions.

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated June 13, 2018, received June 18, 2018, designating Turnkey Processing Solutions as the owner and operator of the installation.

Attachment A – $PM_{2.5}$ Compliance Worksheet

Phoenix Manufacturing, LLC
Howard County (Landgrant 2456)
Project Number: 2018-06-030
Installation ID Number: 089-0001
Permit Number:

This sheet covers the period from ________________ to ____________________.
(month, year) (month, year)

A	B	C	D	E	F
Month	Monthly Hours of Operation[1] (hr/month)	Composite Emission Factor (lb/hr)	Monthly Emission Rate[2] (ton/month)	SSM Emissions[3] (ton/month)	12-Month Rolling Total Emissions[4] (ton/yr)
Example	*400*	*4.081*	*0.816*	*0*	*9.79*
		4.081			
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[1]Enter the number of hours the installation operated in the current month
[2]Calculate by multiplying the current value of [B] with the current value of [C] and dividing by 2,000
[3]Startup, Shutdown, and Malfunction emissions, as reported to the Air Pollution Control Program's Compliance/Enforcement Section according to the provisions of 10 CSR 10-6.050
[4]Calculate by adding the current values of [D] & [E] to the previous 11 months' values of [D] & [E]
A total of less than **10.0** tons of $PM_{2.5}$ per 12 consecutive months is necessary for compliance with Special Condition 1

APPENDIX A

Abbreviations and Acronyms

% ..... percent
°F ..... degrees Fahrenheit
acfm ..... actual cubic feet per minute
BACT ..... Best Available Control Technology
BMPs ..... Best Management Practices
Btu ..... British thermal unit
CAM ..... Compliance Assurance Monitoring
CAS ..... Chemical Abstracts Service
CEMS ..... Continuous Emission Monitor System
CFR ..... Code of Federal Regulations
CO ..... carbon monoxide
CO_2 ..... carbon dioxide
CO_2e ..... carbon dioxide equivalent
COMS ..... Continuous Opacity Monitoring System
CSR ..... Code of State Regulations
dscf ..... dry standard cubic feet
EIQ ..... Emission Inventory Questionnaire
EP ..... Emission Point
EPA ..... Environmental Protection Agency
EU ..... Emission Unit
fps ..... feet per second
ft ..... feet
GACT ..... Generally Available Control Technology
GHG ..... Greenhouse Gas
gpm ..... gallons per minute
gr ..... grains
GWP ..... Global Warming Potential
HAP ..... Hazardous Air Pollutant
hr ..... hour
hp ..... horsepower
lb ..... pound
lbs/hr ..... pounds per hour
MACT ..... Maximum Achievable Control Technology
$\mu g/m^3$ ..... micrograms per cubic meter
m/s ..... meters per second
Mgal ..... 1,000 gallons
MW ..... megawatt
MHDR ..... maximum hourly design rate
MMBtu ..... Million British thermal units
MMCF ..... million cubic feet
MSDS ..... Material Safety Data Sheet
NAAQS ..... National Ambient Air Quality Standards
NESHAPs National Emissions Standards for Hazardous Air Pollutants
NO_x ..... nitrogen oxides
NSPS ..... New Source Performance Standards
NSR ..... New Source Review
PM ..... particulate matter
$PM_{2.5}$ ..... particulate matter less than 2.5 microns in aerodynamic diameter
PM_{10} ..... particulate matter less than 10 microns in aerodynamic diameter
ppm ..... parts per million
PSD ..... Prevention of Significant Deterioration
PTE ..... potential to emit
RACT ..... Reasonable Available Control Technology
RAL ..... Risk Assessment Level
SCC ..... Source Classification Code
scfm ..... standard cubic feet per minute
SDS ..... Safety Data Sheet
SIC ..... Standard Industrial Classification
SIP ..... State Implementation Plan
SMAL ..... Screening Model Action Levels
SO_x ..... sulfur oxides
SO_2 ..... sulfur dioxide
SSM ..... Startup, Shutdown & Malfunction
tph ..... tons per hour
tpy ..... tons per year
VMT ..... vehicle miles traveled
VOC ..... Volatile Organic Compound

2018-06-030 / Phoenix Manufacturing / 089-0001

EU-01

	Pollutant	Emission Factor	Units	Emission Factor Source	Emission Rate (lb/hr)	Potential Emissions (ton/yr)
Plasma Cutting of Mild Steel	PM	21.93	g/min	Swedish Institute document	2.90	12.70
	PM10	16.75	g/min	Particle Size Distribution	2.22	9.70
	PM2.5	9.30	g/min	Particle Size Distribution	1.23	5.39
	NOx	10.85	g/min	TSD Thurston document	1.44	6.29
	Cr	2.0%	% of PM	SDS	0.06	0.25
	Cr (IV)	0.00022	lb/lb Cr	SCAQMD document	0.00001	0.0001
	Pb	0.15%	% of PM	SDS	0.00	0.02
	Mn	1.0%	% of PM	SDS	0.03	0.13
	Ni	1.0%	% of PM	SDS	0.03	0.13

Steel thickness = 0.5 in (12.7 mm) to 1 in (25.4 mm)

Sources:

Swedish Institute of Production Engineering Research document: *Emissions of Fume, Nitrogen Oxide, and Noise in Plasma Cutting of Stainless and Mild St*

Hemispheric Center for Environmental Technology, Florida International University document: *Size Distribution and Rate Production of Airborne Particula*

TSD Appendix document: *Potential to Emit – Emissions Inventory for Thurston Manufacturing Company, Draft Synthetic Minor Source Permit* (June 2014)*

SCAQMD document: *Permit to Operate Evaluation – Plasma Cutters* (July 2008)

*PM Emission Factor =	26	g/min @ 8mm		**NOx Emission Factor =	6.6	g/min @ 8mm	
	2.6	g/min @ 35 mm			13.2	g/min @ 35 mm	
Interpolate ==>	21.93	g/min @ 12.7 mm		Interpolate ==>	10.85	g/min @ 25.4 mm	

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EU-02

Maximum Design Rate (ton/hr)	0.7

Grinding, Sanding, and Drilling of Metal Plates	Pollutant	Emission Factor (lb/ton)	Emission Rate (lb/hr)	Potential Emissions (ton/yr)
	PM	17	11.9	52.12
	PM10	1.7	1.19	5.21
	PM2.5	1.7	1.19	5.21

Source: WebFIRE SCC 30400340

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EU-03

Welding Wire	Composition Percentage (Maximum)							
	Iron	Carbon	Manganese	Silicon	Copper	Nickel	Chromium	Molybdenum
Carbon Steel - Viking ER70S-6	97.74%	0.15%	1.85%	1.15%	0.50%	0.15%	0.15%	0.15%

Welding Wire	Emission Factor (lb/1,000 lb electrode consumed)				
	PM	Cr	Co	Mn	Ni
Carbon Steel - Viking ER70S-6	5.2	0.01	0.01	3.18	0.01

Source: AP-42 Section 12.19

Maximum Design Rate lb/hr)	47

Pollutant	PM	Cr	Co	Mn	Ni
Emission Rate (lb/hr)	0.24	0.00047	0.00047	0.14946	0.00047
Potential Emissions (ton/yr)	1.07	0.0021	0.0021	0.6546	0.0021

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EU-04

Maximum Design Rate (lb/hr)	100

Abrasive Blasting of Metal Parts (controlled with a fabric filter)	PM Emission Factor (lb/1,000 lb abrasive)	PM Emission Rate (lb/hr)	Potential PM Emissions (ton/yr)
	0.69	0.069	0.30

Source: AP-42 Section 13.2.6

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EU-05 / EU-06

MHDR of spray coating = 2.2 gal/hr (Booth); 1.1 gal/hr (Warehouse)
Solids Transfer Efficiency = 50%
Filter Control Efficiency = 95% (Booth)

Coating	Description	Density (lb/gal)	VOC Content (lb/gal)	Solids Content (lb/gal)	HAP Constituents	CAS Number	Maximum HAP Percentage
Durethane DTM Yellow Base Comp A	Acrylic Urethane	9.43	3.51	5.92	(None)	N/A	0%
Amercoat 370 Cure	Epoxy Coating	7.84	2.08	5.76	(None)	N/A	0%
Amercoat 370 Blue FS 15187 Resin	Epoxy Coating	15.11	2.85	12.26	Methyl Isobutyl Ketone	108-10-1	3.8%
					Xylene	1330-20-7	3.2%
					Ethyl Benzene	100-41-4	1.0%
866M Urethane Accel/Amercoat 866M	Urethane Accelerator	8.18	8.08	0.10	(None)	N/A	0%
861 Epoxy Accelerator / 97-723	Epoxy Accelerator	8.10	0.00	8.10	(None)	N/A	0%
Methyl Ethyl Ketone	Solvent/Thinner	6.68	6.68	0.00	(None)	N/A	0%

Coating	Potential Emissions (ton/yr)					
	PM (100% Booth)	VOC	Methyl Isobutyl Ketone	Xylene	Ethyl Benzene	Total HAPs
Durethane DTM Yellow Base Comp A	1.43	33.82	-	-	-	-
Amercoat 370 Cure	1.39	20.04	-	-	-	-
Amercoat 370 Blue FS 15187 Resin	2.95	27.46	5.53	4.66	1.46	11.65
866M Urethane Accel/Amercoat 866M	0.02	77.86	-	-	-	-
861 Epoxy Accelerator / 97-723	1.95	-	-	-	-	-
Methyl Ethyl Ketone	-	64.37	-	-	-	-

Total Worst Case Coatings (not counting additives)	100% Booth Potential Emissions (ton/yr)					
	PM	VOC	Methyl Isobutyl Ketone	Xylene	Ethyl Benzene	Total HAPs
	2.95	33.82	5.53	4.66	1.46	11.65

90% of Total Spray Coating (Booth)	2.66	30.44	4.98	4.19	1.31	10.48
10% of Total Spray Coating (Warehouse)	2.95	1.52	0.25	0.21	0.07	0.52

Total Emissions	5.61	31.96	5.23	4.40	1.38	11.01

EU-07

Activity	MHDR (tons/hr)	(trips/hr)	Transport	type	type	type	We*	Wf*
Receiving	30.0	1.071	100%				12	40
Shipping	30.0	1.071	100%				12	40
title		0.000					0	0
title		0.000					0	0
title		0.000					0	0
title		0.000					0	0
title		0.000					0	0
title		0.000					0	0
title		0.000					0	0

Truck Types

Truck Type	We (tons)	Wf (tons)
Transport	12	40
type		
type		
type		

truck type row must sum to 100% per each activity

1=empty
2=full
3=both

Activities

Road Segment ID	1	2	3	4	5	6	7	8	9	10	11	12	13	14
D one way (feet)	400	400												
D one way (miles)	0.076	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Receiving	3	3												
Shipping														
title														
title														
title														
title														
title														
title														
title														

W

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Receiving	26.000	26.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Shipping	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
title	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
W	26.00	26.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Surface	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Unpaved	Paved

MHDR

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
E(PM2.5) (lbs/VMT):	0.28447	0.28447	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
E(PM10) (lbs/VMT):	2.84467	2.84467	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
E(PM30) (lbs/VMT):	10.00362	10.00362	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM2.5) (lbs/VMT):	0.20263	0.20263	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM10) (lbs/VMT):	2.02634	2.02634	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Eext(PM30) (lbs/VMT):	7.12587	7.12587	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000
Receiving	0.162338	0.162338	0	0	0	0	0	0	0	0	0	0	0	0
Shipping	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
title	0	0	0	0	0	0	0	0	0	0	0	0	0	0
MHDR	0.162338	0.162338	0	0	0	0	0	0	0	0	0	0	0	0

PTE (lb/hr) / PTE (tons/yr)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
PTE PM2.5 (lb/hr)	0.04618	0.04618	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM10 (lb/hr)	0.461797	0.461797	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM30 (lb/hr)	1.623965	1.623965	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM2.5 (lb/hr) w/ rain	0.032895	0.032895	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM10 (lb/hr) w/ rain	0.328951	0.328951	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM30 (lb/hr) w/ rain	1.156797	1.156797	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM2.5 (tons/yr)	0.202267	0.202267	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM10 (tons/yr)	2.022671	2.022671	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM30 (tons/yr)	7.112966	7.112966	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM2.5 (tons/yr) w/ rain	0.144081	0.144081	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM10 (tons/yr) w/ rain	1.440807	1.440807	0	0	0	0	0	0	0	0	0	0	0	0
PTE PM30 (tons/yr) w/ rain	5.06677	5.06677	0	0	0	0	0	0	0	0	0	0	0	0

Totals

	PM	PM10	PM2.5
Receiving	2.313594	0.657903	0.06579
Shipping	0	0	0
title	0	0	0
title	0	0	0
title	0	0	0
title	0	0	0
title	0	0	0
title	0	0	0
title	0	0	0
Sum PTE (lb/hr)	2.313594	0.657903	0.06579
Sum PTE (Tons/yr)	10.13354	2.881614	0.288161

Control Efficiency %

Haul Road BMP's	PM	PM10	PM2.5
No Control	0	0	0

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Pollutant	Emission Rate (lb/hr)	Potential Emissions (ton/yr)	Conditioned Potential Emissions (ton/yr)
PM	18.08	81.94	45.84
PM10	5.66	24.78	13.86
PM2.5	4.08	17.87	10.00
SOx	-	-	-
NOx	1.44	6.29	3.52
VOC	7.30	31.96	17.88
CO	-	-	-
Cr	0.06	0.26	0.14
Cr (VI)	1.28E-05	5.59E-05	3.13E-05
Co	4.70E-04	2.06E-03	1.15E-03
Ethyl Benzene	0.31	1.38	0.77
Pb	0.004	0.019	0.01
Mn	0.18	0.78	0.44
Methyl Isobutyl Ketone	1.19	5.23	2.93
Ni	0.03	0.13	0.07
Xylene	1.01	4.40	2.46
Total HAPs	2.78	12.20	6.82

Composite PM2.5 EF (lb/hr)	4.081