

Public Notice

Virtual Public Hearings About NW Metals' Proposed Air Quality Permit: Dec. 12 and 15, 2020

The Oregon Department of Environmental Quality invites the public to attend a virtual public hearing and to comment on NW Metals Inc's proposed air quality permit, known officially as a Simple Air Contaminant Discharge permit.

Summary

The proposed permit is a new air quality permit for NW Metals auto salvage business at 9537 N. Columbia Blvd. DEQ received NW Metals application for the air quality permit on Feb. 12, 2020, and received an addendum on Aug. 16, 2020. The City of Portland approved NW Metals' Land Use Compatibility Statement, which was received by DEQ on Aug. 16, 2020.

Prior to finalizing the draft permit, NW Metals completed a health-based risk assessment as required by Cleaner Air Oregon, DEQ's newly adopted air toxics permitting program. DEQ has reviewed and approved the results of that assessment. DEQ has concluded the potential emissions meet health risk standards for the community and do not require additional emission control devices to be protective of public health. The draft permit includes operational limitations to maintain this protection. Learn more about the risk assessment at ordeq.org/nwmetals.

How do I participate?

DEQ is hosting two virtual public hearings via Zoom to provide information about the proposed permit and to record oral public comments. You can also submit written comments by mail, fax or email.

Public hearing information

The two virtual public hearings are scheduled on the days and times listed below. To get the meeting information, please register at the link below. If you need translation support during the meeting, you can indicate that during the meeting registration process.

- Saturday, Dec. 12, 2020 at 1 p.m. <http://ordeq.org/nwmhearing1>
- Tuesday, Dec. 15, 2020 at 6 p.m. <http://ordeq.org/nwmhearing2>

Send written comments by mail, fax or email:

Northwest Region AQ Permit Coordinator
700 NE Multnomah St., Ste. 600
Portland, OR 97232

Fax: 503-229-6945

Email: NWRAQPermits@deq.state.or.us

Comments due: 5 p.m., Jan. 8, 2021.

About the facility

NW Metals operates an auto salvage business at 9537 N. Columbia Blvd in Portland. Vehicles are bought from auctions and individual sellers. Upon arrival, all fluids are drained, refrigerant recovered, batteries removed, and wheels and tires are removed. Vehicles are then transferred to the shredding site where they are crushed and fed into an ARJES shredder to be shredded. Recoverable ferrous scrap is then separated out using conveyors and material handling operations.

What air pollutants does the permit regulate?

This permit regulates emissions of the criteria pollutants listed in the table at the end of this document – particulate matter, volatile organic compounds, and carbon monoxide. Toxic air contaminant emissions are also regulated by this permit – a full list of these pollutants can be found in the CAO emissions inventory at ordeq.org/nwmetals.

How does DEQ determine permit requirements?

DEQ evaluates types and amounts of pollutants and the facility's location, and determines permit requirements according to state and federal regulations.

What special conditions are in this permit?

The proposed permit requires NW Metals to remove fluids, refrigerants, batteries, mercury switches and wheels from automobiles prior to shredding and requires the materials removed to be properly recycled or disposed of. DEQ is also limiting the daily and yearly allowable hours of operation, on rolling 24-hour and 12-consecutive month periods, respectively, to maintain health



State of Oregon
Department of
Environmental
Quality

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Contact: David Graiver,
Permit Writer

www.oregon.gov/DEQ

DEQ is a leader in restoring, maintaining and enhancing the quality of Oregon's air, land and water.

protective levels of toxic air contaminant emissions. These conditions require the facility to monitor hours of shredder operation and report this information annually to DEQ.

How does DEQ monitor compliance with the permit requirements?

This permit will require the facility to monitor pollutants using federally approved monitoring practices and standards. The permittee must report instances of excess emissions and must submit semi-annual compliance certifications and an annual report, which includes operating parameters for demonstrating compliance with permit conditions.

DEQ conducts compliance inspections to verify permit conditions are being met and reviews annual reports for actual emissions generated by the facility's overall operations.

What happens after the hearing?

DEQ considers and responds to all comments received and may modify the proposed permit based on comments. If a facility meets all legal

requirements, DEQ will issue the facility's air quality permit.

Where can I get more information?

View information about this project online at ordeq.org/nwmetals, or contact the Northwest Region AQ Permit Coordinator using the following contact information:

Phone: 503-229-5582 or 800-452-4011

Fax: 503-229-6945

Email: NWRAQPermits@deq.state.or.us

View the application and related documents in person at the DEQ office in Portland. For a review appointment, call the NWR AQ Permit Coordinator at 503-229-5582.

Alternative formats

DEQ can provide documents in an alternate format or in a language other than English upon request. Call DEQ at 800-452-4011 or email deqinfo@deq.state.or.us.

Emissions limits

Criteria Pollutants: Table 1 below presents maximum allowable emissions of criteria pollutants for the facility. The proposed emission limit reflects maximum emissions the facility would be able to emit under the proposed permit. Typically, a facility's actual emissions are less than maximum limits established in a permit; however, actual emissions can increase up to the permitted limit.

Table 1

Criteria Pollutants	Proposed Limit (tons/yr)
Particulate matter	24
Carbon monoxide	99
Volatile organic compounds	39

For more information about criteria pollutants, go to: <http://www.epa.gov/criteria-air-pollutants>

Hazardous Air Pollutants

This facility is not a major source of hazardous air pollutants because the potential emissions of HAPs are less than 10 tons per year of any individual HAP and 25 tons per year of combined HAPs. This source is not subject to any National Emission Standards for Hazardous Air Pollutants. Potential emissions of combined hazardous air pollutants from the facility are approximately 0.51 tons per year. For more information about hazardous air pollutants, go to: <https://www.epa.gov/haps/health-effects-notebook-hazardous-air-pollutants>

Toxic Air Contaminants

This facility has the potential to emit a number of TACs from shredding and material handling operations, as well as diesel exhaust emissions. The CAO process for this facility indicated that daily and annual operational restrictions are required to maintain health protective levels of these emissions. More information is available at ordeq.org/nwmetals.



OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
SIMPLE
AIR CONTAMINANT DISCHARGE PERMIT

Northwest Region
700 NE Multnomah St., Suite 600
Portland, OR 97232

This permit is being issued in accordance with the provisions of ORS 468A.040 and based on the land use compatibility findings included in the permit record.

ISSUED TO:

NW Metals Inc
930 NW 12th Ave. Ste 524
Portland, OR 97209

INFORMATION RELIED UPON:

Application No.: 031787
Date Received: 02/12/2020

PLANT SITE LOCATION:

NW Metals Inc
9537 North Columbia Boulevard
Portland, OR 97203

LAND USE COMPATIBILITY FINDING:

Approving Authority: City of Portland
Approval Date: 08/07/2020

ISSUED BY THE DEPARTMENT OF ENVIRONMENTAL QUALITY

Steven A. Dietrich, Northwest Region Air Quality Manager

Dated

Source(s) Permitted to Discharge Air Contaminants (OAR 340-216-8010):

Table 1 Code	Source Description	SIC/NAICS
Part B, 85	Source which would have actual emissions, if the source were to operate uncontrolled, of 10 or more tons per year of any single criteria pollutant; Motor vehicle parts, used	5015/423140, 5093/423930

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1.0 DEVICE, PROCESS AND POLLUTION CONTROL DEVICE (PCD) IDENTIFICATION

1.1. The devices, processes, and pollution control devices regulated by this permit are the following:

Devices and Processes Description	Device ID	Pollution Control Device Description
Volvo Penta 700 hp Compression Ignition Shredder Engine	7600-Engine3	EPA Tier 4f Certified
Arjes VZ 950 Titan Shredder	7600-Shredder3	N/A
Material Handling	7600-MH	N/A
Fluid Draining of Automobiles	7600-Drain	N/A

1.2. The permittee is prohibited from operating the following devices which are located at the facility:

Devices and Processes Description	Device ID	Pollution Control Device Description
Volvo Penta 768 hp Compression Ignition Shredder Engine	7600-Engine2	EPA Tier 2 Certified
Arjes VZ 950 Titan Shredder	7600-Shredder2	N/A

2.0 GENERAL EMISSION STANDARDS AND LIMITS

2.1. Visible Emissions

- a. The permittee must comply with the following visible emission limits from air contaminant sources other than fugitive emission sources, as applicable.
 - i. Emissions from 7600-Engine3, and 7600-Shredder3 must not equal or exceed 20% opacity. [OAR 340-208-0110(2) and (4)]
 - ii. Any devices or processes installed, constructed, or modified on or after June 1, 1970 must not equal or exceed 20% opacity. [OAR 340-208-0110(4)]
- b. At least weekly, the permittee must conduct a six (6) minute visible emission survey of 7600-Engine3, and 7600-Shredder3 using EPA Method 22. [OAR 340-208-0210]
 - i. The permittee must conduct the EPA Method 22 test while the emissions units are operating under normal conditions.

- ii. The person conducting this survey does not have to be EPA Method 9 certified. However, the individual should be familiar with the procedures of EPA Method 9 including using the proper location to observe visible emissions.
- iii. If visible emissions are detected for more than 5% (18 seconds) of the survey time, the permittee must take corrective action to reduce visible emissions.
- iv. No monitoring is required if the entire facility is shut down.
- v. The permittee must record the corrective action taken or the results of the EPA Method 22 tests in a log.

2.2. Fugitive Emissions

- a. The permittee must take reasonable precautions to prevent fugitive dust emissions from leaving the property of a source. Reasonable precautions include, but are not limited to: [OAR 340-208-0210]
 - i. Using, where possible, water or chemicals for control of dust in the demolition of existing buildings or structures, construction operations, the grading of roads or the clearing of land;
 - ii. Applying water or other suitable chemicals on unpaved roads, materials stockpiles, and other surfaces which can create airborne dusts;
 - iii. Enclosing (full or partial) materials stockpiles in cases where application of water or other suitable chemicals are not sufficient to prevent particulate matter, including dust, from becoming airborne;
 - iv. Promptly removing earth or other material that does or may become airborne from paved streets;
 - v. Covering, at all times when in motion, open bodied trucks transporting materials likely to become airborne; and
 - vi. Developing a DEQ approved fugitive emission control plan upon request by DEQ if the above precautions are not adequate and implementing the plan whenever fugitive emissions leave the property for more than 18 seconds in a six-minute period.
- b. In no case may fugitive dust emissions leave the property of a source for a period or periods totaling more than 18 seconds in a six-minute period. Fugitive emissions must be measured by EPA method 22 weekly along the north, west, south, and east fence lines of the property with the minimum observation time of six minutes at each location.
- c. The permittee must record the results and any corrective actions taken of the EPA Method 22 tests in a log.

2.3. Particulate Matter Emissions

The permittee must comply with the following particulate matter emission limits.

- a. Particulate matter emissions from 7600-Engine3, and 7600-Shredder3 must not exceed 0.10 grains per standard cubic foot. [OAR 340-226-0210(2)(c)]
- b. Non-fugitive particulate matter emissions from processes listed in OAR 340-226-0300 must not exceed the process weight emission standards shown in the Table in OAR 340-226-8010.

- c. Particulate matter emissions from any fuel burning equipment (except solid fuel burning devices that have been certified under OAR 340-262-0500) that is installed, constructed or modified on or after April 16, 2015 must not exceed 0.10 grains per dry standard cubic foot, corrected to 12% CO₂ or 50% excess air. [OAR 340-228-0210(2)(c)]
- d. Particulate matter emissions from any device or process (other than fugitive emissions sources, fuel burning equipment, refuse burning equipment, or solid fuel burning devices certified under OAR 340-262-0500) that is installed, constructed or modified after April 16, 2015 must not exceed 0.10 grains per dry standard cubic foot. [OAR 340-226-0210(2)(c)]

2.4. Particulate Matter Fallout

The permittee must not cause or permit the deposition of any particulate matter larger than 250 microns in size at sufficient duration or quantity, as to create an observable deposition upon the real property of another person. [OAR 340-208-0450]

2.5. Complaint Log

The permittee must maintain a log of all complaints received by the permittee in person, in writing, by telephone or through other means that specifically refer to air pollution or odor concerns associated with the permitted facility. Documentation must include: [OAR 340-214-0114]

- a. The date the complaint was received;
- b. The date and time the complaint states the condition was present;
- c. A description of the pollution or odor condition;
- d. The location of the complainant/receptor relative to the plant site;
- e. The status of plant operation or activities during the complaint's stated time of pollution or odor condition; and
- f. A record of the permittee's actions to investigate the validity of each complaint and a record of actions taken for complaint resolution.

2.6. Fuels and Fuel Sulfur Content

The permittee must not use any fuels other than natural gas, propane, butane, or ultra-low sulfur diesel with no more than 0.0015% sulfur by weight. [OAR 340-228-0110]

3.0 SPECIFIC PERFORMANCE AND EMISSION STANDARDS

3.1. Processing of Incoming Automobiles

- a. The permittee must remove the following fluids from each automobile prior to shredding: [OAR 340-260-0030(1) and 340-226-0110]
 - i. chlorofluorocarbons;

- ii. Fuel (e.g., gasoline, diesel);
 - iii. Antifreeze;
 - iv. Brake fluid;
 - v. Engine oil;
 - vi. Transmission fluid;
 - vii. Power steering fluid;
 - viii. Differential fluid (if present); and
 - ix. Windshield washer fluid.
- b. The permittee must remove the following items from each automobile prior to shredding: [OAR 340-226-0110]
- i. Batteries;
 - ii. Mercury Switches; and
 - iii. Lead (e.g., battery connectors, wheel weights)
- c. The permittee must properly store and dispose of all materials removed from automobiles. [OAR 340-260-0030(1) and 340-226-0110]

3.2. Chlorofluorocarbons Removal

- a. The permittee must use only recovery and recycling equipment that is certified by Underwriters Laboratory (UL) as meeting the requirements and specifications of UL1963 and the Society of Automotive Engineers (SAE) Standards, J1990 and J1991, or other requirements and specifications determined by the Department as being equivalent. [OAR 340-260-0030 (3)]
- b. The permittee must operate and maintain all recovery and recycling equipment at full efficiency and effectiveness according to the manufacturer's directions and guidelines contained in SAE Standard J1989. [OAR 340-260-0030 (4)]

3.3. Asbestos

The permittee must comply with the asbestos abatement requirements in OAR 340, division 248 for all activities involving asbestos-containing materials, including, but not limited to, demolition, renovation, repair, construction, and maintenance.

4.0 OPERATION AND MAINTENANCE REQUIREMENTS

4.1. Operation of Pollution Control Devices and Processes

The permittee must operate and ensure proper functioning of all air pollution control devices and components at all times when the associated emission source is operating. [OAR 340-226-0120]

4.2. Highest and Best Practicable Treatment and Control

The permittee must provide the highest and best practicable treatment and control of air contaminant emissions in every case so as to maintain overall air quality at the highest possible levels, and to maintain contaminant concentrations, visibility reduction, odors, soiling, and other deleterious factors at the lowest possible levels. [OAR 340-226-0100]

5.0 PLANT SITE EMISSION LIMITS**5.1. Plant Site Emission Limits (PSEL)**

The permittee must not cause or allow plant site emissions to exceed the following: [OAR 340-222-0040]

Pollutant	Limit	Units
PM	24	Tons per year
CO	99	
VOC	39	

5.2. Annual Period

The annual plant site emissions limits apply to any 12-consecutive calendar month period. [OAR 340-222-0035]

6.0 SOURCE RISK LIMITS**6.1. Annual Activity**

The permittee must limit the shredding operations, including metal shredding, diesel combustion and associated material handling activities, of the facility to 2,800 hours per year. [OAR 340-245-0110]

6.2. Annual Period

The annual source risk limits of Condition 6.1. apply to any 12-consecutive calendar month period. [OAR 340-245-0110(1)(a)]

6.3. Acute Activity

The permittee must limit the shredding operations, including metal shredding, diesel combustion and associated material handling activities, of the facility to 8.5 hours per day. [OAR 340-245-0110]

6.4. Acute Period

The acute source risk limits of Condition 6.3. apply to any 24-consecutive hour period. [OAR 340-245-0110(1)(b)]

6.5. Risk Assessment Revision and Permit Modification

The permittee must submit an application for modification, and may be required to submit a revised risk assessment, pursuant to OAR 340-245-0100(8), if DEQ or the permittee determines that the shredding capacity of 7600-Shredder3 exceed 10 tons per hour as determined by Condition 7.4.

7.0 COMPLIANCE DEMONSTRATION

7.1. Monitoring Requirements

The permittee must monitor the operation and maintenance of the facility and associated air contaminant control devices as follows: [OAR 340-226-0120]

- a. Quantity of material shredded in 7600-Shredder3 (tons);
- b. Hours of operation of 7600-Engine3; and
- c. Quantity of automobiles that gasoline is removed from.

7.2. PSEL Compliance Monitoring using Emission Factors

The permittee must calculate the emissions for each 12-consecutive calendar month period based on the following calculation for each pollutant except GHGs: [OAR 340-222-0080]

$$E = \Sigma(EF \times P) \times 1 \text{ ton}/2000 \text{ pounds}$$

where:

- E = pollutant emissions (tons/year);
Σ = symbol representing “summation of”;
EF = pollutant emission factor (see Condition 13.0);
P = process throughput (e.g., tons, hours)

7.3. Emission Factors

The permittee must use the default emission factors provided in Condition 13.0 for calculating pollutant emissions, unless alternative emission factors are approved in writing by DEQ. The permittee may request or DEQ may require using alternative emission factors provided they are based on actual test data or other documentation (e.g., AP-42 compilation of emission factors) that has been reviewed and approved by DEQ. [OAR 340-222-0080]

7.4. Capacity Source Test

The permittee must perform source testing to determine the maximum capacity of the Arjes VZ 950 Titan Shredder (7600-Shredder3) within 90 days of permit issuance. [OAR 340-212-0120]

8.0 RECORDKEEPING REQUIREMENTS

8.1. Operation and Maintenance

The permittee must maintain the following records related to the operation and maintenance of the facility and associated air contaminant control devices: [OAR 340-214-0114]

- a. Quantity of material shredded (tons) in 7600-Shredder3 for each:
 - i. Month; and
 - ii. 12-consecutive month period.
- b. Hours of operation of 7600-Engine3 for each:
 - i. Hour;
 - ii. 24-consecutive hour period;
 - iii. Month; and
 - iv. 12-consecutive month period.
- c. Quantity of automobiles that gasoline is removed from for each:
 - i. Month; and
 - ii. 12-consecutive month period.
- d. Weekly Visible Emission logs identified in Conditions 2.1.b and 2.2.b.;
- e. Records that all fluids and materials identified in Conditions 3.1.a and 3.1.b are removed from automobiles prior to shredding;
- f. Documentation that chlorofluorocarbon recovery and recycling equipment meets the requirements of Condition 3.2.a.;
- g. Asbestos records in accordance with Condition 3.3;

8.2. Excess Emissions

- a. The permittee must maintain the records of excess emissions listed below and as defined in OAR 340-214-0300 through 340-214-0340, recorded on occurrence. Typically, excess emissions are caused by process upsets, startups, shutdowns, or scheduled maintenance.

In many cases, excess emissions are evident when visible emissions are greater than 20% opacity as a six-minute block average.

- i. The date and time of the beginning of the excess emissions event and the duration or best estimate of the time until return to normal operation;
 - ii. The date and time the permittee notified DEQ of the event;
 - iii. The equipment involved;
 - iv. Whether the event occurred during planned startup, planned shutdown, scheduled maintenance, or as a result of a breakdown, malfunction, or emergency;
 - v. Steps taken to mitigate emissions and corrective action taken, including whether the approved procedures for a planned startup, shutdown, or maintenance activity were followed;
 - vi. The magnitude and duration of each occurrence of excess emissions during the course of an event and the increase over normal rates or concentrations as determined by continuous monitoring or best estimate (supported by operating data and calculations); and
 - vii. The final resolution of the cause of the excess emissions;
- b. If there is an ongoing excess emission caused by an upset or breakdown, the permittee must immediately take action to minimize emissions by reducing or ceasing operation of the equipment or facility, unless doing so could result in physical damage to the equipment or facility, or cause injury to employees. In no case may the permittee operate more than 48 hours after the beginning of the excess emissions, unless continued operation is approved by DEQ in accordance with OAR 340-214-0330(4).
 - c. In the event of any excess emissions which are of a nature that could endanger public health and occur during non-business hours, weekends, or holidays, the permittee must immediately notify DEQ by calling the Oregon Emergency Response System (OERS). The current number is 1-800-452-0311.
 - d. The permittee must maintain a log of all excess emissions in accordance with OAR 340-214-0340(3).

8.3. Complaint Log

The permittee must maintain a log of all complaints received by the permittee in person, in writing, by telephone or through other means that specifically refer to air pollution concerns associated to the permitted facility. Documentation must include date of contact, date and time of observed nuisance condition, description of nuisance condition, location of receptor, status of plant operation during the observed period, and date and time of response to complainant. The log must include a record of the permittee's actions to investigate the validity of each complaint and a record of actions taken for complaint resolution. [OAR 340-214-0114]

8.4. Retention of Records

Unless otherwise specified, the permittee must retain all records for a period of at least five (5) years from the date of the monitoring sample, measurement, report, or application and make them available to DEQ upon request. The permittee must maintain the two (2) most recent years of records onsite. [OAR 340-214-0114]

9.0 REPORTING REQUIREMENTS

9.1. Initial Reporting

Within 30 days of permit issuance the permittee must provide DEQ with a dated photograph of the current hour meter reading of 7600-Engine2.

9.2. Excess Emissions

The permittee must notify DEQ of excess emissions events if the excess emission is of a nature that could endanger public health.

- a. The permittee must also submit follow-up reports summarizing records of excess emissions as required in Condition 8.2 when required by DEQ.
- b. Such notice must be provided as soon as possible, but never more than one hour after becoming aware of the problem. Notice must be made to the regional office identified in Condition 11.3. by email, telephone, facsimile, or in person.

9.3. Semi-annual Report

For each year this permit is in effect, the permittee must submit to DEQ by **July 31** for the January 1 to June 30 reporting period and by **February 15** for the July 1 to December 31 reporting period a Semi-Annual Compliance Certification (DEQ Form R1002) for the following Conditions: [OAR 340-214-0110 and 340-216-0064(3)(c)]

- a. Condition 3.1.a.;
- b. Condition 3.1.b.;
- c. Condition 3.1.c.;
- d. Condition 3.2.b.; and
- e. Condition 3.3.

9.4. Annual Report

For each year this permit is in effect, the permittee must submit to DEQ by **February 15** two (2) paper copies and one (1) electronic copy of the following information for the previous calendar year:

- a. Operating parameters:
 - i. Quantity of material shredded (tons) in 7600-Shredder3 for each:
 - A. Month; and
 - B. 12-consecutive month period.
 - ii. Hours of operation of and 7600-Engine3 for each:
 - A. Hour;

- B. 24-consecutive hour period;
 - C. Month; and
 - D. 12-consecutive month period.
- iii. Quantity of automobiles that gasoline is removed from for each:
- A. Month; and
 - B. 12-consecutive month period.
- b. The second semi-annual compliance certification.
 - c. A dated photograph of the current hour meter reading of 7600-Engine2.
 - d. Calculations of annual pollutant emissions determined each month in accordance with Condition 7.2.
 - e. A brief summary listing the date, time, and the affected device/process for each excess emission that occurred during the reporting period.
 - f. Summary of complaints relating to air quality received by permittee during the year in accordance with Condition 8.3.
 - g. List permanent changes made in facility process, production levels, and pollution control equipment which affected air contaminant emissions.
 - h. List major maintenance performed on emissions units identified in Condition 1.0.

9.5. Greenhouse Gas Registration and Reporting

- a. If the calendar year greenhouse gas emissions (CO₂e) are ever greater than or equal to 2,756 tons (2,500 metric tons), the permittee must annually register and report its greenhouse gas emissions with DEQ in accordance with OAR 340 division 215.
- b. If the calendar year greenhouse gas emissions (CO₂e) are less than 2,756 tons (2,500 metric tons) for three consecutive years, the permittee may stop reporting greenhouse gas emissions but must retain all records used to calculate greenhouse gas emissions for the five years following the last year that they were required to report. The permittee must resume reporting its greenhouse gas emissions if the calendar year greenhouse gas emissions (CO₂e) are greater than or equal to 2,756 tons (2,500 metric tons) in any subsequent calendar year.

9.6. Notice of Change of Ownership or Company Name

The permittee must notify DEQ in writing using a DEQ "Transfer Application Form" within 60 days after the following:

- a. Legal change of the name of the company as registered with the Corporations Division of the State of Oregon; or
- b. Sale or exchange of the activity or facility.

9.7. Construction or Modification Notices

The permittee must notify DEQ in writing using a DEQ “Notice of Intent to Construct Form,” or other permit application form and obtain approval in accordance with OAR 340-210-0205 through 340-210-0250 and OAR 340-245-0060(4)(c) before:

- a. Constructing, installing, or establishing a new stationary source that will cause an increase in any regulated pollutant emissions;
- b. Making any physical change or change in operation of an existing stationary source that will cause an increase, on an hourly basis at full production, in any regulated pollutant emissions; or
- c. Constructing or modifying any air pollution control equipment.

10.0 ADMINISTRATIVE REQUIREMENTS

10.1. Permit Renewal Application

The permittee must submit the completed application package for renewal of this permit **180 days prior to the expiration date**. Two (2) paper copies and one (1) electronic copy of the application must be submitted to the DEQ Permit Coordinator listed in Condition 11.2. [OAR 340-216-0040]

10.2. Permit Modifications

Application for a modification of this permit must be submitted within 60 days prior to the source modification. When preparing an application, the applicant should also consider submitting the application 180 days prior to allow DEQ adequate time to process the application and issue a permit before it is needed. A special activity fee must be submitted with an application for the permit modification. The fees and two (2) copies of the application must be submitted to the DEQ Business Office.

10.3. Annual Compliance Fee

The permittee must pay the annual fees specified in OAR 340-216-8020, Table 2, Part 2 and 3 for a Standard ACDP on **December 1** of each year this permit is in effect. An invoice indicating the amount, as determined by DEQ regulations will be mailed prior to the above date. **Late fees in accordance with Part 5 of the table will be assessed as appropriate.**

10.4. Change of Ownership or Company Name Fee

The permittee must pay the non-technical permit modification fee specified in OAR 340-216-8020, Table 2, Part 4 with an application for changing the ownership or the name of the company.

10.5. Special Activity Fees

The permittee must pay the special activity fees specified in OAR 340-216-8020, Table 2, Part 4 with an application to modify the permit.

11.0 DEQ CONTACTS / ADDRESSES

11.1. Business Office

The permittee must submit payments for invoices, applications to modify the permit, and any other payments to DEQ's Business Office:

Oregon Dept. of Environmental Quality
Financial Services – Revenue Section
700 Multnomah St., Suite 600
Portland, Oregon 97232-4100

11.2. Permit Coordinator

The permittee must submit all notices, reports (annual reports, source test plans and reports, etc.), and applications that do not include payment to the Permit Coordinator.

Oregon Dept. of Environmental Quality
Northwest Region
AQ Permit Coordinator
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100
nwraqpermits@deq.state.or.us

11.3. Report Submittals

Unless otherwise notified, the permittee must submit all reports (annual reports, source test plans and reports, etc.) to DEQ's Region. If you know the name of the Air Quality staff member responsible for your permit, please include it:

Oregon Dept. of Environmental Quality
Northwest Region Air Quality
700 NE Multnomah St., Suite 600
Portland, OR 97232-4100

11.4. Web Site

Information about air quality permits and DEQ's regulations may be obtained from the DEQ web page at www.oregon.gov/deq/.

12.0 GENERAL CONDITIONS AND DISCLAIMERS

12.1. Permitted Activities

- a. Until this permit expires or is modified or revoked, the permittee is allowed to discharge air contaminants from the following:
 - i. Processes and activities directly related to or associated with the devices/processes listed in Condition 1.0 of this permit;
 - ii. Any categorically insignificant activities, as defined in OAR 340-200-0020, at the source;
 - iii. Construction or modification changes that are Type 1 or Type 2 changes under OAR 340-210-0225 that are approved by DEQ in accordance with OAR 340-210-0215 through 0250, if the permittee complies with all of the conditions of DEQ's approval to construct and all of the conditions of this permit; and
 - iv. Construction or modification changes that are approved by DEQ in accordance with OAR 340-245-0060(4)(c) and OAR 340-245-0100(8), if the permittee complies with all of the conditions of DEQ's approval to construct and all of the conditions of this permit.
- b. Discharge of air contaminants from any other equipment or activity not identified herein is not authorized by this permit.

12.2. Other Regulations

In addition to the specific requirements listed in this permit, the permittee must comply with all other applicable legal requirements enforceable by DEQ.

12.3. Conflicting Conditions

In any instance in which there is an apparent conflict relative to conditions in this permit, the most stringent conditions apply. [OAR 340-200-0010]

12.4. Masking of Emissions

The permittee must not cause or permit the installation of any device or use any means designed to mask the emissions of an air contaminant that causes or is likely to cause detriment to health, safety, or welfare of any person or otherwise violate any other regulation or requirement. [OAR 340-208-0400]

12.5. DEQ Access

The permittee must allow DEQ's representatives access to the plant site and pertinent records at all reasonable times for the purposes of performing inspections, surveys, collecting samples, obtaining data, reviewing and copying air contaminant emissions discharge records and conducting all necessary functions related to this permit in accordance with ORS 468.095.

12.6. Permit Availability

The permittee must have a copy of the permit available at the facility at all times. [OAR 340-216-0020(3)]

12.7. Open Burning

The permittee may not conduct any open burning except as allowed by OAR 340, division 264.

12.8. Property Rights

The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state, or local laws or regulations.

12.9. Permit Expiration

- a. A source may not be operated after the expiration date of the permit, unless any of the following occur prior to the expiration date of the permit: [OAR 340-216-0082]
 - i. A timely and complete application for renewal of this permit or for a different ACDP has been submitted; or
 - ii. A timely and complete application for renewal or for an Oregon Title V Operating Permit has been submitted; or
 - iii. Another type of permit (ACDP or Oregon Title V Operating Permit) has been issued authorizing operation of the source.
- b. For a source operating under an ACDP or Oregon Title V Operating Permit, a requirement established in an earlier ACDP remains in effect notwithstanding expiration of the ACDP, unless the provision expires by its terms or unless the provision is modified or terminated according to the procedures used to establish the requirement initially.

12.10. Permit Termination, Revocation, or Modification

DEQ may terminate, revoke, or modify this permit pursuant to OAR chapter 340 division 216. [OAR 340-216-0082].

13.0 EMISSION FACTORS

Emissions device or activity	Pollutant	Emission Factor (EF)	EF units	EF Reference
Automobile Shredding	PM	0.00994	lb/ton material shredded	Compilation of Stack Test Data received by ODEQ
	VOC	0.282		
7600-Engine3 (Shredder #3 Engine)	PM	0.023	lb/hr	USEPA Tier 4f
	CO	3.97		
	VOC	0.22		
Material handling	PM	0.0674	lb/ton material shredded	AP-42 13.2.4 Drop Point Equation
Gasoline Draining from Automobiles	VOC	0.11	lb/automobile	Derived in Emission Detail Sheet

14.0 ABBREVIATIONS, ACRONYMS, AND DEFINITIONS

ACDP	Air Contaminant Discharge Permit	NSPS	New Source Performance Standard
ASTM	American Society for Testing and Materials	NSR	New Source Review
AQMA	Air Quality Maintenance Area	O ₂	oxygen
calendar year	The 12-month period beginning January 1st and ending December 31 st	OAR	Oregon Administrative Rules
CAO	Cleaner Air Oregon	ORS	Oregon Revised Statutes
CFR	Code of Federal Regulations	O&M	operation and maintenance
CO	carbon monoxide	Pb	lead
CO ₂	carbon dioxide	PCD	pollution control device
CO _{2e}	carbon dioxide equivalent	PM	particulate matter
DEQ	Oregon Department of Environmental Quality	PM ₁₀	particulate matter less than 10 microns in size
dscf	dry standard cubic foot	PM _{2.5}	particulate matter less than 2.5 microns in size
EF	Emission factor	ppm	part per million
EPA	US Environmental Protection Agency	PSD	Prevention of Significant Deterioration
FCAA	Federal Clean Air Act	PSEL	Plant Site Emission Limit
Gal	gallon(s)	PTE	Potential to Emit
GHG	greenhouse gas	RACT	Reasonably Available Control Technology
gr/dscf	grains per dry standard cubic foot	scf	standard cubic foot
HAP	Hazardous Air Pollutant as defined by OAR 340-244-0040	SER	Significant Emission Rate
hp	horsepower	SIC	Standard Industrial Code
I&M	inspection and maintenance	SIP	State Implementation Plan
lb	pound(s)	SO ₂	sulfur dioxide
MMBtu	million British thermal units	Special Control Area	as defined in OAR 340-204-0070
N/A	not applicable	TACT	Typically Achievable Control Technology
NESHAP	National Emissions Standards for Hazardous Air Pollutants	VE	visible emissions
NO _x	nitrogen oxides	VOC	volatile organic compound
		year	A period consisting of any 12-consecutive calendar months



State of Oregon
Department of
Environmental
Quality

SIMPLE AIR CONTAMINANT DISCHARGE PERMIT REVIEW REPORT

NW Metals Inc
9537 North Columbia Boulevard
Portland, OR, 97218

Source Information:

SIC	5015, 5093
NAICS	423140, 423930

Source Categories (Table 1 Part, code)	Part B, 85
Public Notice Category	III

Compliance and Emissions Monitoring Requirements:

FCE	
Compliance schedule	
Unassigned emissions	
Emission credits	
Special Conditions	X

Source test	
COMS	
CEMS	
PEMS	
Ambient monitoring	

Reporting Requirements

Annual report (due date)	February 15
Quarterly report (due dates)	

Monthly report (due dates)	
Excess emissions report	
Other (Semi-Annual)	Feb. 15, July 15

Air Programs

Synthetic Minor (SM)	
SM -80	
NSPS (list subparts)	
NESHAP (list subparts)	
CAO	X
NSR	

PSD	
GHG	
RACT	
TACT	
Other (specify)	

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PERMITTING

PERMITTEE IDENTIFICATION

1. NW Metals Inc
9537 North Columbia Boulevard
Portland, OR, 97203

PERMITTING ACTION

2. NW Metals Inc (NW Metals) was initially located at 7600 NE Killingsworth and was determined to be an existing source for the purposes of Cleaner Air Oregon in accordance with OAR 340-245-0020 because construction had commenced on this facility prior to November 16, 2018. As an existing source the permittee is required to perform a risk assessment in accordance with OAR 340-245-0050, and demonstrate compliance with the Risk Action Levels for an “Existing Source” in OAR 340-245-8010 Table 1 when called in by DEQ. NW Metals was called in on May 19, 2020. However, NW Metals moved to 9537 North Columbia Boulevard prior to finalizing the risk assessment.
3. NW Metals has been determined to be a new source for the purposes of Cleaner Air Oregon in accordance with OAR 340-245-0020 because the air quality permit application was not submitted and deemed complete, nor had construction commenced on this facility before November 16, 2018, at the Columbia Boulevard location. As a new source the permittee is required to perform a risk assessment in accordance with OAR 340-245-0050, and demonstrate compliance with the Risk Action Levels for a “New and Reconstructed Source” in OAR 340-245-8010 Table 1.

OTHER PERMITS

4. DEQ required NW Metals to obtain a Solid Waste Permit but has not issued any other permits for NW Metals at the North Columbia Boulevard location.

ATTAINMENT STATUS

5. The source is located in a maintenance area for carbon monoxide (CO) and ozone [oxides of nitrogen (NO_x) and volatile organic compounds (VOC) are precursors of ozone] and in an attainment area for all other NAAQS pollutants.

SOURCE DESCRIPTION

OVERVIEW

6. The permittee operates a metals recycling facility. NW Metals obtains end of life vehicles (ELVs), sheet metals, and left over metal from manufacturing.

ELVs are bought from auctions and individual sellers. Upon arrival, all fluids are drained, refrigerant recovered, batteries removed, and wheels and tires are removed. Batteries and oils are stored onsite and then sent for recycling. Gasoline and refrigerant are reused in automobiles. Usable tires are sold and waste tires are disposed of. Materials are then transferred to the shredding site where they are crushed and fed into an ARJES shredder (<https://www.arjes.de/en/>) to be shredded. NW Metals will not engage in any plasma or torch cutting in the dismantling process. Final products of the shredding process are iron, steel, zorba (e.g., aluminum) and fluff. The metals are sold as scrap and the fluff is sent to a municipal waste landfill. The facility began operation at 7600 NE Killingsworth St. on March 27, 2014, but did not operate a shredder until early 2018.

7. The permittee processes recreational vehicles (RVs). Some RVs contain asbestos-containing materials as defined in OAR 340-248-0010, and may not be demolished unless all conditions within OAR 340-248 are followed, including survey, abatement, and disposal requirements.
8. On June 20, 2018, DEQ approved a Type II Notice of Intent to Construct (NC) for installation and operation of an Arjes VZ 950 Mini Shredder for the shredding of scrap automobiles.
9. On August 24, 2018, DEQ informed NW Metals that the NC was reevaluated and an ACDP was required for installation and operation of the Arjes VZ 950 Shredder. DEQ provided NW Metals 60 days to submit an ACDP application.
10. In April of 2019, NW Metals informed DEQ that Arjes will be providing NW Metals with a replacement shredder due to the current shredder breaking down so frequently. The new shredder began operation on or around October 31, 2019.
11. On February 12, 2020, DEQ received an ACDP application. However, the application did not include a land use compatibility statement (LUCS). The LUCS was received by DEQ on March 13, 2020, and resulted in NW Metal's ACDP application being labeled complete as of March 13, 2020.
12. On August 16, 2020, the permittee notified DEQ that they plan to move their operations to 9537 North Columbia Boulevard and provided DEQ with a revised LUCS for the new location.
13. On September 8, 2020, the permittee provided DEQ with an updated project description and facility layout diagram for the North Columbia Boulevard location.

PROCESS AND CONTROL DEVICES

14. Air contaminant sources at the facility consist of the following:
 - a. Two Arjes VZ 950 Titan Shredders.
 - i. Shredder #2 (installed at the Killingsworth location in October 2018) is powered by a 768 hp Volvo Penta diesel engine certified to USEPA Tier 2 standards. NW Metals plans to move this unit off site but it is still capable of being operated. Until it's removed, NW Metals is prohibited from operating the emissions unit.

- ii. Shredder #3 (installed at the Killingsworth location in October 2019) is powered by a 700 hp Volvo Penta diesel engine certified to USEPA Tier 4f standards. NW Metals plans to operate the shredder for approximately 30 hours per week.
- iii. Both shredders are shearing shredders and each have a maximum capacity of approximately 10 tons of automotive scrap per hour.
- b. Fluid (e.g., gasoline, oils) draining of autos prior to shredding which results in the emissions of VOC and HAP. All oils drained from automobiles are sent off-site for processing.
- c. Aggregate insignificant activities from draining and recycling of automotive refrigerants (e.g., chlorofluorocarbons) which can result in emissions of GHGs to the atmosphere.

CONTINUOUS MONITORING DEVICES

- 15. The facility has non-resettable hour meters on both of the Volvo Penta engines that power the Arjes VZ 950 Titan Shredders.

COMPLIANCE HISTORY

- 16. On November 7, 2018, DEQ issued a Pre Enforcement Notice (2018-PEN-4015) to NW Metals for failing to submit an ACDP application.
- 17. On November 5, 2019, DEQ issued a Pre Enforcement Notice (2019-PEN-5105) to NW Metals for installing the new shredder without first submitting an ACDP application.
- 18. A full discussion of the compliance history for this facility's operations at 7600 NE Killingsworth Street is available on DEQ's web page at <http://www.oregon.gov/deq/Programs/Pages/nescrap.aspx>.
- 19. The facility will continue to be inspected by DEQ personnel to ensure compliance with the permit conditions and all other applicable regulations.

EMISSIONS

20. Proposed PSEL information:

Pollutant	Baseline Emission Rate (tons/yr)	Netting Basis		Plant Site Emission Limits (PSEL)		
		Previous (tons/yr)	Proposed (tons/yr)	Previous PSEL (tons/yr)	Proposed PSEL (tons/yr)	PSEL Increase (tons/yr)
PM	N/A	N/A	0	N/A	24	24
CO	N/A	N/A	0	N/A	99	99
VOC	N/A	N/A	0	N/A	39	39

- a. The netting basis is zero for Simple ACDPs and portable sources in accordance with OAR 340-222-0046(2).
- b. For Simple ACDPs, the proposed PSELs for all pollutants are equal to the Generic PSEL in accordance with OAR 340-216-0064(3)(b).
- c. The PTE for PM₁₀ and PM_{2.5} are both below de minimis levels so PSELs for these pollutants are not included in the ACDP.
- d. The PSEL is a federally enforceable limit on the potential to emit.

SIGNIFICANT EMISSION RATE ANALYSIS

21. For each pollutant, the proposed Plant Site Emission Limit is less than the sum of the Netting Basis and the significant emission rate, thus no further air quality analysis is required at this time.

TITLE V MAJOR SOURCE APPLICABILITY

22. A major source is a facility that has the potential to emit 100 tons/year or more of any criteria pollutant or 10 tons/year or more of any single HAP or 25 tons/year or more of combined HAPs. This facility is not a major source of emissions. The basis for this determination can be found in the emission detail sheet.
23. A source that has the potential to emit less than major source thresholds is called a true minor. This source is a true minor. The basis for this determination can be found in the emission detail sheet.

CRITERIA POLLUTANTS

24. This facility is a minor source of criteria pollutant emissions.

HAZARDOUS AIR POLLUTANTS

25. This source is not a major source of hazardous air pollutants. The HAP emissions detail is provided in the emission detail sheet.

CLEANER AIR OREGON

26. NW Metals performed a Level 1 Risk Assessment for the metal shredding operations and associated material handling activities at this facility as required by the Cleaner Air Oregon (CAO) program. This assessment included Toxic Air Contaminant (TAC) emissions from Shredder #3, the diesel engine used to power Shredder #3, and material handling activities of Automotive Shredder Residue. This assessment assumed a shredding capacity of 10 tons per hour for the shredder in order to calculate TAC emissions using hours of operation as the basis. The results of this assessment are shown in the table below, and indicate that risk does not exceed the Toxic Lowest Achievable Emissions Rate Risk Assessment Levels; however community engagement is required for this facility. Both Annual and Acute Source Risk Limits for this facility will be based on hours of operation, with monitoring requirements based on the non-resettable hour meters of the diesel engines in the shredders. The facility will also be required to demonstrate compliance with the risk assessment results by demonstrating that the maximum shredder throughput capacity does not exceed 10 tons per hour.

Risk Type	Facility Risk	Risk Assessment Results
Cancer Risk – added cancer risk per million with 70 years of exposure		
Residential (e.g. homes near facility)	4	Facility Risk is below the Risk Action Level* limit of 10.
Non-Residential Child (e.g. school near facility)	<0.5	
Non-Residential Worker (e.g. office near facility)	10	Facility Risk is at the Risk Action Level limit of 10.
Noncancer Risk – Hazard Index (less than or equal to 1 is considered safe)		
Annual Exposure-Residential (e.g. home)	<0.5	Facility Risk is below the Risk Action Level limit of 1.
Annual Exposure-Non-Residential Child (e.g. school)	<0.5	
Annual Non-Residential Worker (e.g. office)	<0.5	
24-Hour Exposure (acute)	1	Facility Risk is at the Risk Action limit of 1.

*DEQ requires risk reduction if risk is above these Risk Action Levels.

TOXICS RELEASE INVENTORY

27. The Toxics Release Inventory (TRI) is a federal program that tracks the management of certain toxic chemicals that may pose a threat to human health and the environment, over which DEQ has no regulatory authority. It is a resource for learning about toxic chemical releases and pollution prevention activities reported by certain industrial facilities. Section 313 of the Emergency Planning and Community Right-to-Know Act (EPCRA) created the TRI Program. In general, [chemicals covered by the TRI Program](#) are those that cause:
- a. Cancer or other chronic human health effects;
 - b. Significant adverse acute human health effects; or
 - c. Significant adverse environmental effects.
28. There are currently over 650 chemicals covered by the TRI Program. Facilities that manufacture, process or otherwise use these chemicals in amounts above established levels must submit annual TRI reports on each chemical.
29. NW Metals is not covered by the TRI program because it is not one of the specific industry sectors required to report under the TRI program.

ADDITIONAL REQUIREMENTS

NEW SOURCE PERFORMANCE STANDARDS APPLICABILITY

30. There are no devices/processes at this facility for which a New Source Performance Standard has been promulgated. NSPS that appear applicable but do not apply to devices/processes at this facility are discussed below.
31. 40 CFR Part 60, Subpart III, “Stationary Compression Ignition Internal Combustion Engines” is not applicable to the source because the engines that power the shredders also propel the shredders, making them nonroad engines as opposed to stationary engines.

NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS APPLICABILITY

32. There are no sources at this facility for which a National Emission Standard for Hazardous Air Pollutant standard has been promulgated. NESHAP that appear applicable but do not apply to devices/processes at this facility are discussed below.
33. 40 CFR Part 63, Subpart ZZZZ, “Stationary Reciprocating Internal Combustion Engines” is not applicable to the source because the engines that power the shredders also propel the shredders, making them nonroad engines as opposed to stationary engines.

GREENHOUSE GAS REPORTING APPLICABILITY

34. The source is not subject to greenhouse gas reporting under division 215 if actual greenhouse gas emissions are less than 2,500 metric tons (2,756 short tons) of CO₂ equivalents per year. If the source ever emits more than this amount, they will be required to report greenhouse gas emissions.

REASONABLY AVAILABLE CONTROL TECHNOLOGY APPLICABILITY

35. The facility is located in the Portland AQMA but it is not one of the listed source categories in OAR 340-232-0010, thus the RACT rules do not apply.

TYPICALLY ACHIEVABLE CONTROL TECHNOLOGY APPLICABILITY

36. The source is likely meeting OAR 340-226-0130 Highest and Best Practicable Treatment and Control: Typically Achievable Control Technology (TACT) by:
 - a. Draining all fluids from automobiles prior to shredding;
 - b. Removing batteries, mercury switches, and lead from automobiles prior to shredding; and
 - c. Using an engine certified to USEPA Tier 4f standards.

SOURCE TESTING

PRIOR TESTING RESULTS

37. There are no previous source tests for this facility.

PROPOSED TESTING

38. DEQ is requiring NW Metals to perform source testing of Shredder#3 to determine its maximum throughput capacity.
39. DEQ is not requiring NW Metals to perform source testing to determine emissions from the shredding process. However, NW Metals may perform source testing if they want a source specific emission factor for their shredder. If NW Metals does emissions testing they must test in accordance with DEQ's Source Sampling Manual.

PUBLIC NOTICE

40. Pursuant to OAR 340-209-0030(4), issuance of this Air Contaminant Discharge Permit requires public notice in accordance with OAR 340-209-0030(3)(c), which requires DEQ

to provide notice of the proposed permit action and a minimum of 35 days for interested persons to submit written comments. **The public notice was emailed/mailed on November 6, 2020 and the comment period will end on January 8, 2021 at 5 p.m.**

DEQ is hosting two virtual public hearings via Zoom; one on Saturday, December 12, 2020 at 1 p.m. and the other on Tuesday, December 15, 2020 at 6 p.m.

dg:pj

Proposed

Permit No.: 26-0315-SI-01

Application No.: 031787

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ATTACHMENT A – EMISSION DETAIL SHEETS

VOC and PM Shredder EF Derivation

	Greenf[1]	Sims[2]	Omni[3]	MN[4]	SSI[5]	ISRI [9]	CCM [10]	GenI [11]	GenI [11]		Mean
	Autos										
PM (lb/hr)	2.2			0.769			0.16	1.9			
VOC (lb/hr)	7.13		22.93	39.55					94.87		
Rate	53.21		165	195.5			67.5	302.83	390.13		
PM (lb/ton)	4.13E-02	3.16E-03		3.93E-03		2.57E-03	2.37E-03	6.27E-03			9.94E-03
VOC (lb/ton)	1.34E-01	1.32E-01	1.39E-01	2.02E-01	8.40E-01				2.43E-01		2.82E-01

Key

[1] Greenfield MA - wTe Recycling, November 18-20, 2015

[2] SMM New England Corporation Johnston, RI, April 26, 2018, VOC results as propane

[3] Omnisource Jackson MI, April 2010, VOC results as propane

[4] MN NorMet2017. <https://www.pca.state.mn.us/air/northern-metals-shredder-building-test-results>

[5] Schnitzer Steel Compilation, October 2019 Foulweather Consulting Report, 100% Autos

[9] ISRI Title V Applicability Workbook, 1998 Edition Table D10-F

[10] Capitol City Metals 2005

[11] General Iron, Chicago, IL, May 25, 2018

Shredder Emissions

Shredder Capacity 10 ton/hr
 Operational Limit 85 ton/day CAO 24-hour Limit
 Operational Limit 28,000 ton/yr CAO Annual Limit

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	PTE (lbs/hr)	PTE (lbs/day)	PTE (tons/yr)	
PM	9.94E-03	lb/ton	VOC&PM Worksheet	0.10	0.85	0.14	
PM ₁₀	9.94E-03	lb/ton		0.10	0.85	0.14	
PM _{2.5}	9.94E-03	lb/ton		0.10	0.85	0.14	
VOC	2.82E-01	lb/ton		2.82	23.95	3.94	
Hazardous Air Pollutants							
As	7.00E-08	lb/ton	CAO Analysis	7.00E-07	5.95E-06	9.80E-07	
Benzene	1.14E-03	lb/ton		1.14E-02	9.68E-02	1.59E-02	
Cd	7.71E-06	lb/ton		7.71E-05	6.55E-04	1.08E-04	
Co	1.34E-07	lb/ton		1.34E-06	1.14E-05	1.88E-06	
Cr ⁶⁺	1.65E-05	lb/ton		1.65E-04	1.40E-03	2.31E-04	
Dioxins/Furans	1.74E-11	lb/ton		1.74E-10	1.48E-09	2.44E-10	
Ethylbenzene	1.05E-03	lb/ton		1.05E-02	8.91E-02	1.47E-02	
Hexane	3.42E-03	lb/ton		3.42E-02	2.91E-01	4.79E-02	
Hg	4.97E-05	lb/ton		4.97E-04	4.22E-03	6.95E-04	
Methyl bromide (Bromomethane)	1.30E-06	lb/ton		1.30E-05	1.10E-04	1.82E-05	
Methyl chloroform (1,1,1-Trichloroethane)	2.00E-04	lb/ton		2.00E-03	1.70E-02	2.80E-03	
Methyl Isobutyl Ketone	8.57E-05	lb/ton		8.57E-04	7.28E-03	1.20E-03	
Methylene chloride (Dichloromethane)	2.37E-04	lb/ton		2.37E-03	2.01E-02	3.32E-03	
Mn	2.39E-06	lb/ton		2.39E-05	2.03E-04	3.34E-05	
Naphthalene	3.44E-05	lb/ton		3.44E-04	2.92E-03	4.81E-04	
Ni	8.81E-07	lb/ton		8.81E-06	7.49E-05	1.23E-05	
Pb	7.72E-05	lb/ton		7.72E-04	6.56E-03	1.08E-03	
PCBs	1.51E-04	lb/ton		1.51E-03	1.28E-02	2.11E-03	
Sb	2.23E-07	lb/ton		2.23E-06	1.90E-05	3.12E-06	
Styrene	3.59E-04	lb/ton		3.59E-03	3.05E-02	5.03E-03	
Tetrachloroethylene (Perchloroethylene)	2.03E-05	lb/ton		2.03E-04	1.73E-03	2.84E-04	
Toluene	5.36E-03	lb/ton		5.36E-02	4.55E-01	7.50E-02	
Trichloroethylene	6.67E-05	lb/ton		6.67E-04	5.67E-03	9.34E-04	
Vinyl Chloride	3.44E-06	lb/ton		3.44E-05	2.92E-04	4.81E-05	
Vinylidene chloride (1,1-Dichloroethylene)	2.67E-05	lb/ton		2.67E-04	2.27E-03	3.74E-04	
Xylenes	4.89E-03	lb/ton		4.89E-02	4.16E-01	6.85E-02	
Total HAPs	1.72E-02				1.72E-01	1.46	0.24

Engine 2 Emissions

Volvo Penta TAD1643VE

Tier II

Engine Capacity:	768 hp	
Engine Capacity:	565 kW	
Maximum Fuel Capacity	210 g/kW-hr	(TAD1643VE Specifications)
Maximum Fuel Capacity	37.68 gal/hr	
Diesel Fuel Heat Content	0.138 MMBtu/gal	
Heat Input Capacity	5.20 MMBtu/hr	
Sulfur Content of Fuel	0.0015 %	
Operational Limit	0 hr/year	Use Prohibited

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	PTE (lbs/hr)	PTE (tons/yr)
PM	0.15	g/hp-hr	Reference 1	0	0
PM ₁₀	0.15	g/hp-hr	Reference 1	0	0
PM _{2.5}	0.15	g/hp-hr	Reference 1	0	0
SO _x	1.21E-05	lb/hp-hr	Reference 2	0	0
NO _x	4.80	g/hp-hr	Reference 1	0	0
CO	2.60	g/hp-hr	Reference 1	0	0
VOC	4.80	g/hp-hr	Reference 1	0	0
Hazardous Air Pollutants					
1,3-Butadiene	2.17E-01	lb/Mgal	CAO Analysis	0	0
Acetaldehyde	7.83E-01	lb/Mgal		0	0
Acrolein	3.39E-02	lb/Mgal		0	0
As	1.60E-03	lb/Mgal		0	0
Benzene	1.86E-01	lb/Mgal		0	0
Cd	1.50E-03	lb/Mgal		0	0
Cr ⁶⁺	1.00E-04	lb/Mgal		0	0
Ethylbenzene	1.09E-02	lb/Mgal		0	0
Formaldehyde	1.73E+00	lb/Mgal		0	0
HCl	1.86E-01	lb/Mgal		0	0
Hexane	2.69E-02	lb/Mgal		0	0
Hg	2.00E-03	lb/Mgal		0	0
Mn	3.10E-03	lb/Mgal		0	0
Naphthalene	1.97E-02	lb/Mgal		0	0
Ni	3.90E-03	lb/Mgal		0	0
Pb	8.30E-03	lb/Mgal		0	0
Polycyclic Aromatic Hydrocarbons	3.62E-02	lb/Mgal		0	0
Toluene	1.05E-01	lb/Mgal		0	0
Xylene	4.24E-02	lb/Mgal		0	0
Total HAPs					0
Greenhouse Gases					
CO ₂	73.96	kg/MMBtu	Reference 3	0	0
CH ₄	3.00E-03	kg/MMBtu	Reference 4	0	0
N ₂ O	6.00E-04	kg/MMBtu	Reference 4	0	0
GHGs (mass basis)				0	0
GHGs (CO ₂ e basis) ^[1]				0	0

^[1]40 CFR 98, Table A-1 (10/2009)

Reference 1: Tier 2 Emission Standards

Reference 2: AP-42 Table 3.4-1 (10/96)

Reference 3: 40 CFR 98, Table C-1 (11/2013)

Reference 4: 40 CFR 98, Table C-2 (11/2013)

Engine 3 Emissions

Engine Capacity:	700 hp	
Engine Capacity:	515 kW	
Maximum Fuel Capacity	202 g/kW-hr	(TAD1670-1672VE Specifications)
Maximum Fuel Capacity	33.03 gal/hr	
Diesel Fuel Heat Content	0.138 MMBtu/gal	
Heat Input Capacity	4.56 MMBtu/hr	
Sulfur Content of Fuel	0.0015 %	
Operational Limit	2800 hr/year	CAO Annual Limit

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	PTE (lbs/hr)	PTE (tons/yr)
PM	2.00E-02	g/kW-hr	Reference 1	0.02	3.18E-02
PM ₁₀	2.00E-02	g/kW-hr	Reference 1	0.02	3.18E-02
PM _{2.5}	2.00E-02	g/kW-hr	Reference 1	0.02	3.18E-02
SO _x	1.21E-05	lb/hp-hr	Reference 2	8.49E-03	1.19E-02
NO _x	0.40	g/kW-hr	Reference 1	0.45	0.64
CO	3.50	g/kW-hr	Reference 1	3.97	5.56
VOC	0.19	g/kW-hr	Reference 1	0.22	0.30
Hazardous Air Pollutants					
1,3-Butadiene	2.17E-01	lb/Mgal	CAO Analysis	7.18E-03	1.01E-02
Acetaldehyde	7.83E-01	lb/Mgal		2.59E-02	3.62E-02
Acrolein	3.39E-02	lb/Mgal		1.12E-03	1.57E-03
As	1.60E-03	lb/Mgal		5.29E-05	7.40E-05
Benzene	1.86E-01	lb/Mgal		6.15E-03	8.62E-03
Cd	1.50E-03	lb/Mgal		4.96E-05	6.94E-05
Cr ⁶⁺	1.00E-04	lb/Mgal		3.30E-06	4.62E-06
Ethylbenzene	1.09E-02	lb/Mgal		3.60E-04	5.04E-04
Formaldehyde	1.73E+00	lb/Mgal		5.70E-02	7.98E-02
HCl	1.86E-01	lb/Mgal		6.15E-03	8.62E-03
Hexane	2.69E-02	lb/Mgal		8.89E-04	1.24E-03
Hg	2.00E-03	lb/Mgal		6.61E-05	9.25E-05
Mn	3.10E-03	lb/Mgal		1.02E-04	1.43E-04
Naphthalene	1.97E-02	lb/Mgal		6.51E-04	9.11E-04
Ni	3.90E-03	lb/Mgal		1.29E-04	1.80E-04
Pb	8.30E-03	lb/Mgal		2.74E-04	3.84E-04
Polycyclic Aromatic Hydrocarbons	3.62E-02	lb/Mgal		1.20E-03	1.67E-03
Toluene	1.05E-01	lb/Mgal		3.48E-03	4.87E-03
Xylene	4.24E-02	lb/Mgal		1.40E-03	1.96E-03
Total HAPs					0.11
Greenhouse Gases					
CO ₂	73.96	kg/MMBtu	Reference 3	743	1,041
CH ₄	3.00E-03	kg/MMBtu	Reference 4	3.02E-02	4.22E-02
N ₂ O	6.00E-04	kg/MMBtu	Reference 4	6.03E-03	8.44E-03
GHGs (mass basis)				743	1,041
GHGs (CO ₂ e basis) ^[1]				746	1,044

^[1]40 CFR 98, Table A-1 (10/2009)

Reference 1: Tier 4f Emission Standards (40 CFR 1039.101)

Reference 2: AP-42 Table 3.4-1 (10/96)

Reference 3: 40 CFR 98, Table C-1 (11/2013)

Reference 4: 40 CFR 98, Table C-2 (11/2013)

Material Handling Emissions

AP-42 13.2.4 Drop Point Equation

Wind (mph) 7
 Moisture (%) 0.25

Emission Factor (per drop)

PM (lb/ton)	6.74E-02
PM10 (lb/ton)	3.19E-02
PM2.5 (lb/ton)	4.83E-03

ASR Content 30 %
 Max Hourly Throughput 10 ton/hr
 Annual Throughput 28,000 ton/yr CAO Annual Limit (2,800 hr/yr)
 # of Transfers 1

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	PTE (lbs/hr)	PTE (tons/yr)
PM	6.74E-02	lb/ton	Derived	0.67	0.94
PM ₁₀	3.19E-02	lb/ton	Derived	0.32	0.45
PM _{2.5}	4.83E-03	lb/ton	Derived	0.05	0.07
Hazardous Air Pollutants					
Arsenic and compounds	2.55E-10	lb/lb	CAO Analysis	1.53E-06	2.14E-06
Cadmium and compounds	4.05E-10	lb/lb	CAO Analysis	2.43E-06	3.40E-06
Cobalt and compounds	3.49E-10	lb/lb	CAO Analysis	2.10E-06	2.93E-06
Lead and compounds	1.85E-07	lb/lb	CAO Analysis	1.11E-03	1.55E-03
Manganese and compounds	8.72E-09	lb/lb	CAO Analysis	5.23E-05	7.33E-05
Mercury and compounds	1.04E-11	lb/lb	CAO Analysis	6.22E-08	8.71E-08
Nickel compounds, insoluble	6.22E-09	lb/lb	CAO Analysis	3.73E-05	5.23E-05
Benzene	5.44E-10	lb/lb	CAO Analysis	3.27E-06	4.57E-06
Ethyl benzene	1.95E-09	lb/lb	CAO Analysis	1.17E-05	1.63E-05
Naphthalene	2.25E-09	lb/lb	CAO Analysis	1.35E-05	1.89E-05
Styrene	3.02E-09	lb/lb	CAO Analysis	1.81E-05	2.54E-05
Toluene	5.16E-09	lb/lb	CAO Analysis	3.10E-05	4.33E-05
Xylenes	1.14E-08	lb/lb	CAO Analysis	6.83E-05	9.57E-05
Polychlorinated biphenyls (PCBs)	2.55E-10	lb/lb	CAO Analysis	1.53E-06	2.14E-06
Hexachlorobenzene	1.75E-11	lb/lb	CAO Analysis	1.05E-07	1.47E-07
Polycyclic aromatic hydrocarbons	4.78E-10	lb/lb	CAO Analysis	2.87E-06	4.01E-06
Bis(2-ethylhexyl) phthalate (DEHP)	1.32E-10	lb/lb	CAO Analysis	7.94E-07	1.11E-06
Total HAP				1.36E-03	1.90E-03

Fluid Draining Emissions

Density of Air at STP: 0.0765 lb/ft³
 Density of Air at STP: 0.0102 lb/gal
 Gasoline Vapor Density: 0.0409 lb/gal
 gasoline SDS indicates gasoline vapor density is approximately 4x that of air
 Fuel remaining per auto: 2.7 gal

Processing End-of-Life Vehicles: A Guide for Environmental Protection, Safety and Profit in the United States-Mexico Border Area JULY 2017

VOC Emission Factor 0.1105 lb/auto
 Autos processed per year: 18,667 (based on Shredder PTE)
 10 ton/hr autos X 2,800 hr/yr ÷ 1.5 ton/auto

Pollutant	Emission Factor	Emission Factor Units	Emission Factor Source	PTE (lbs/hr)	PTE (tons/yr)
VOC	0.11	lb/auto	Derived	0.24	1.03
Hazardous Air Pollutants					
2,2,4 Trimethylpentane	2.6	percent	Reference 1	6.12E-03	2.68E-02
Benzene	2.2	percent	Reference 1	5.18E-03	2.27E-02
Ethylbenzene	0.5	percent	Reference 1	1.18E-03	5.15E-03
Hexane	4.4	percent	Reference 1	1.04E-02	4.54E-02
Toluene	4.0	percent	Reference 1	9.41E-03	4.12E-02
Xylenes	1.5	percent	Reference 1	3.53E-03	1.55E-02
Total HAPs	11.0	percent	Reference 1	2.59E-02	0.11

Reference 1: Table 3-1 from Gasoline Distribution Industry (Stage 1) Background Information For Proposed Standards (January 1994)

Source PTE

Emissions at 2,800 hours of operation per year

Pollutant	Potential to Emit (tpy)					
	Engine ^[1]	Crusher	Material Handling	Drain	Total	PSEL
PM	0.03	0.14	0.94		1.11	24
PM ₁₀	0.03	0.14	0.45		0.62	N/A
PM _{2.5}	0.03	0.14	0.07		0.24	N/A
SO _x	1.19E-02				1.19E-02	N/A
NO _x	0.64				0.64	N/A
CO	5.56				5.56	99
VOC	0.30	3.94		1.03	5.28	39
GHGs	1,041				1,041	N/A
Total HAP	0.16	0.24	1.90E-03	0.11	0.51	N/A

^[1] PTE based on highest emitting engine

Emissions without Permit Limits (i.e., 8,760 hours of operation per year)

Pollutant	Potential to Emit (tpy)					
	Engines	Crusher	Material Handling	Drain	Total	PSEL
PM	1.21	0.87	5.90		7.99	24
PM ₁₀	1.21	0.87	2.79		4.88	14
PM _{2.5}	1.21	0.87	0.42		2.51	9
SO _x	7.80E-02				7.80E-02	N/A
NO _x	37.59				37.59	39
CO	36.69				36.69	99
VOC	36.54	24.68		6.45	67.67	39
GHGs	7,001				7,001	74,000
Total HAP	1.02	1.51	3.96E-02	0.71	3.28	N/A

CAO Parameters

TEU		Activity	Hours of Operation	
		Tons/hour	Annual	Acute
Shredder		10	2800	8.5
Toxic Air Contaminant	Emission Factor	Emissions		
	[lb/ton]	[lb/hr]	[lb/yr]	[lb/day]
Antimony and compounds	2.23E-07	2.23E-06	6.24E-03	1.90E-05
Arsenic and compounds	7.00E-08	7.00E-07	1.96E-03	5.95E-06
Barium and compounds	1.56E-06	1.56E-05	4.38E-02	1.33E-04
Beryllium and compounds	1.46E-08	1.46E-07	4.10E-04	1.25E-06
Cadmium and compounds	7.71E-06	7.71E-05	2.16E-01	6.55E-04
Chromium VI, chromate and dichromate particulate	1.65E-05	1.65E-04	4.62E-01	1.40E-03
Cobalt and compounds	1.34E-07	1.34E-06	3.75E-03	1.14E-05
Copper and compounds	1.54E-06	1.54E-05	4.32E-02	1.31E-04
Lead and compounds	7.72E-05	7.72E-04	2.16E+00	6.56E-03
Manganese and compounds	2.39E-06	2.39E-05	6.68E-02	2.03E-04
Mercury and compounds	4.97E-05	4.97E-04	1.39E+00	4.22E-03
Nickel compounds, insoluble	8.81E-07	8.81E-06	2.47E-02	7.49E-05
Phosphorus and compounds	9.01E+00	9.01E+01	2.52E+05	7.66E+02
Selenium and compounds	3.00E-07	3.00E-06	8.41E-03	2.55E-05
Thallium and compounds	5.83E-08	5.83E-07	1.63E-03	4.96E-06
Silver and compounds	2.53E-07	2.53E-06	7.09E-03	2.15E-05
Zinc and compounds	1.69E-04	1.69E-03	4.72E+00	1.43E-02
1,1-Dichloroethane (Ethylidene dichloride)	1.33E-05	1.33E-04	3.72E-01	1.13E-03
Benzene	1.14E-03	1.14E-02	3.19E+01	9.68E-02
Ethyl benzene	1.05E-03	1.05E-02	2.94E+01	8.91E-02
Hexane	3.42E-03	3.42E-02	9.58E+01	2.91E-01
Bromomethane (Methyl bromide)	1.30E-06	1.30E-05	3.63E-02	1.10E-04
1,1,1-Trichloroethane (Methyl chloroform)	2.00E-04	2.00E-03	5.60E+00	1.70E-02
2-Butanone (Methyl ethyl ketone)	5.33E-06	5.33E-05	1.49E-01	4.53E-04
Methyl isobutyl ketone (MIBK, Hexone)	8.57E-05	8.57E-04	2.40E+00	7.28E-03
Dichloromethane (Methylene chloride)	2.37E-04	2.37E-03	6.63E+00	2.01E-02
Naphthalene	3.44E-05	3.44E-04	9.63E-01	2.92E-03
Styrene	3.59E-04	3.59E-03	1.01E+01	3.05E-02
Tetrachloroethene (Perchloroethylene)	2.03E-05	2.03E-04	5.68E-01	1.73E-03
Toluene	5.36E-03	5.36E-02	1.50E+02	4.55E-01
Trichloroethene (TCE, Trichloroethylene)	6.67E-05	6.67E-04	1.87E+00	5.67E-03
Vinyl Chloride	3.44E-06	3.44E-05	9.63E-02	2.92E-04
Vinylidene chloride	2.67E-05	2.67E-04	7.47E-01	2.27E-03
Xylene (mixture), including m-xylene, o-xylene, p-xylene	4.89E-03	4.89E-02	1.37E+02	4.16E-01
Polychlorinated biphenyls (PCBs)	1.51E-04	1.51E-03	4.23E+00	1.28E-02
Polychlorinated biphenyls (PCBs) TEQ	2.61E-10	2.61E-09	7.31E-06	2.22E-08
Polychlorinated dibenzo-p-dioxins (PCDDs) & dibenzofura	1.74E-11	1.74E-10	4.87E-07	1.48E-09
PAHs	8.99E-06	8.99E-05	2.52E-01	7.64E-04

CAO Parameters

TEU		Activity	Hours of Operation	
		Tons/hour	Annual	Acute
Diesel Engine		10	2800	8.5
Toxic Air Contaminant	Emission Factor	Emissions		
	[lb/Mgal]	[lb/hr]	[lb/yr]	[lb/day]
Benzene	1.86E-01	5.96E-03	1.67E+01	5.07E-02
1,3-Butadiene	2.17E-01	6.96E-03	1.95E+01	5.91E-02
Cadmium and compounds	1.50E-03	4.80E-05	1.34E-01	4.08E-04
Formaldehyde	1.73E+00	5.52E-02	1.55E+02	4.69E-01
Chromium VI, chromate, and dichromate particulate	1.00E-04	3.20E-06	8.96E-03	2.72E-05
Arsenic and compounds	1.60E-03	5.12E-05	1.43E-01	4.35E-04
Lead and compounds	8.30E-03	2.66E-04	7.44E-01	2.26E-03
Nickel and compounds	3.90E-03	1.25E-04	3.49E-01	1.06E-03
Naphthalene	1.97E-02	6.30E-04	1.77E+00	5.36E-03
PAHs (excluding Naphthalene)*	3.62E-02	1.16E-03	3.24E+00	9.85E-03
Benzo[a]pyrene*	3.55E-05	1.14E-06	3.18E-03	9.66E-06
Acetaldehyde	7.83E-01	2.51E-02	7.02E+01	2.13E-01
Acrolein	3.39E-02	1.08E-03	3.04E+00	9.22E-03
Ammonia**	8.00E-01	2.56E-02	7.17E+01	2.18E-01
Copper and compounds	4.10E-03	1.31E-04	3.67E-01	1.12E-03
Ethylbenzene	1.09E-02	3.49E-04	9.77E-01	2.96E-03
Hexane	2.69E-02	8.61E-04	2.41E+00	7.32E-03
Hydrochloric acid	1.86E-01	5.96E-03	1.67E+01	5.07E-02
Manganese and compounds	3.10E-03	9.92E-05	2.78E-01	8.43E-04
Mercury and compounds	2.00E-03	6.40E-05	1.79E-01	5.44E-04
Selenium and compounds	2.20E-03	7.04E-05	1.97E-01	5.98E-04
Toluene	1.05E-01	3.37E-03	9.44E+00	2.87E-02
Xylene (mixture), including m-xylene, o-xylene, p-xylene	4.24E-02	1.36E-03	3.80E+00	1.15E-02
Diesel exhaust particulates (PM 2.5)^(Engine 3)	7.4	2.37E-01	6.63E+02	2.01E+00

CAO Parameters

TEU		Activity	Hours of Operation	
		Tons/hour	Annual	Acute
Material Handling (ASR)		10	2800	8.5
Toxic Air Contaminant	Emission Factor	Emissions		
	[lb/lb]	[lb/hr]	[lb/yr]	[lb/day]
Aluminum and compounds	1.25527E-07	7.53E-04	2.11E+00	6.40E-03
Arsenic and compounds	2.552E-10	1.53E-06	4.29E-03	1.30E-05
Barium and compounds	5.50275E-10	3.30E-06	9.24E-03	2.81E-05
Cadmium and compounds	4.0513E-10	2.43E-06	6.81E-03	2.07E-05
Cobalt and compounds	3.49305E-10	2.10E-06	5.87E-03	1.78E-05
Copper and compounds	5.63992E-07	3.38E-03	9.48E+00	2.88E-02
Lead and compounds	1.8502E-07	1.11E-03	3.11E+00	9.44E-03
Manganese and compounds	8.72465E-09	5.23E-05	1.47E-01	4.45E-04
Mercury and compounds	1.03675E-11	6.22E-08	1.74E-04	5.29E-07
Nickel compounds, insoluble	6.2205E-09	3.73E-05	1.05E-01	3.17E-04
Zinc and compounds	1.86615E-07	1.12E-03	3.14E+00	9.52E-03
Benzene	5.44294E-10	3.27E-06	9.14E-03	2.78E-05
Ethyl benzene	1.9451E-09	1.17E-05	3.27E-02	9.92E-05
Naphthalene	2.25294E-09	1.35E-05	3.78E-02	1.15E-04
Styrene	3.02253E-09	1.81E-05	5.08E-02	1.54E-04
Toluene	5.15983E-09	3.10E-05	8.67E-02	2.63E-04
1,2,4 -Trimethylbenzene	1.09577E-08	6.57E-05	1.84E-01	5.59E-04
1,3,5-Trimethylbenzene	3.99548E-09	2.40E-05	6.71E-02	2.04E-04
Xylene (mixture), including m-xylene, o-xylene, p-xylene	1.13883E-08	6.83E-05	1.91E-01	5.81E-04
Polychlorinated biphenyls (PCBs)	2.552E-10	1.53E-06	4.29E-03	1.30E-05
Polychlorinated biphenyls (PCBs) TEQ	3.19E-15	1.91E-11	5.36E-08	1.63E-10
Polychlorinated dibenzo-p-dioxins (PCDDs) & dibenzofurans (PCDFs) TEQ	3.509E-15	2.11E-11	5.90E-08	1.79E-10
Polychlorinated naphthalenes	5.9015E-13	3.54E-09	9.91E-06	3.01E-08
Hexachlorobenzene	1.7545E-11	1.05E-07	2.95E-04	8.95E-07
2,4,6-Trichlorophenol	1.595E-11	9.57E-08	2.68E-04	8.13E-07
PBDDs/PBDFs	1.03675E-12	6.22E-09	1.74E-05	5.29E-08
Polybrominated diphenyl ethers (PBDEs)	2.79125E-09	1.67E-05	4.69E-02	1.42E-04
Tetrabromobisphenol A	9.33075E-12	5.60E-08	1.57E-04	4.76E-07
Hexabromocyclododecane	5.33528E-11	3.20E-07	8.96E-04	2.72E-06
2,4,6-Tribromophenol	1.9778E-12	1.19E-08	3.32E-05	1.01E-07
Polycyclic aromatic hydrocarbons (PAHs)	4.77703E-10	2.87E-06	8.03E-03	2.44E-05
Bis(2-ethylhexyl) phthalate (DEHP)	1.32385E-10	7.94E-07	2.22E-03	6.75E-06