

**Air Permit No.
AQ0290TVP03**

Portable Rock Crusher Training

January 2023

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Today's Topics

Portable Rock Crusher
- Mine

Portable Rock Crusher
- Port Road / AAEP

Portable Rock Crusher
- DMTS Port Facilities

Method-9 Compliance
Summary

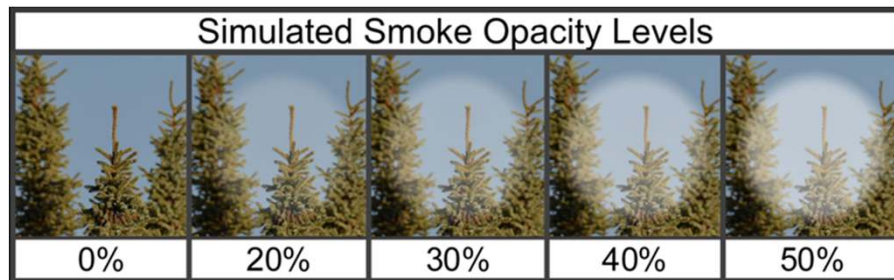


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PRC Opacity Limits

Opacity is dust or smoke that obscures visibility

- Do not exceed 7% or 12 % (depending on crusher component) averaged over 6-minutes.



↑ **Out of Compliance** ↑

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PRC Mine Specific Limits

Particulate Matter

- Do not exceed 0.05 grains per standard cubic foot.

WHAT ARE THE HEALTH RISKS OF PARTICULATE MATTER?

Particulate matter poses a serious health risk because it can travel into the respiratory tract. PM2.5 is especially dangerous because it can penetrate deep into the lungs and sometimes even into the bloodstream.

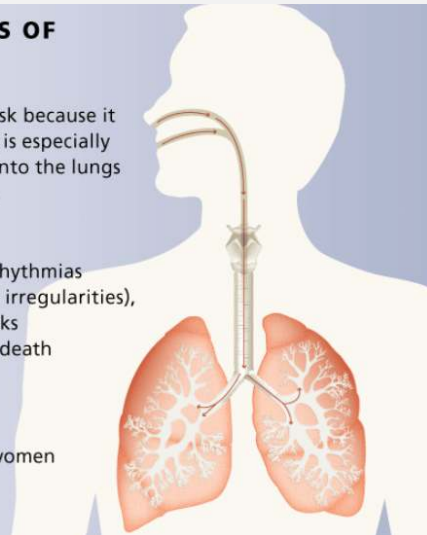
HEALTH EFFECTS

- » Decreased lung function
- » Chronic bronchitis
- » Increased respiratory symptoms
- » Cardiac arrhythmias (heartbeat irregularities),
- » Heart attacks
- » Premature death

GROUPS SENSITIVE TO PM2.5

- » People with heart or lung disease
- » Older adults
- » Children
- » Pregnant women

Source: www.epa.gov



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PRC Mine Emission Unit Identifiers

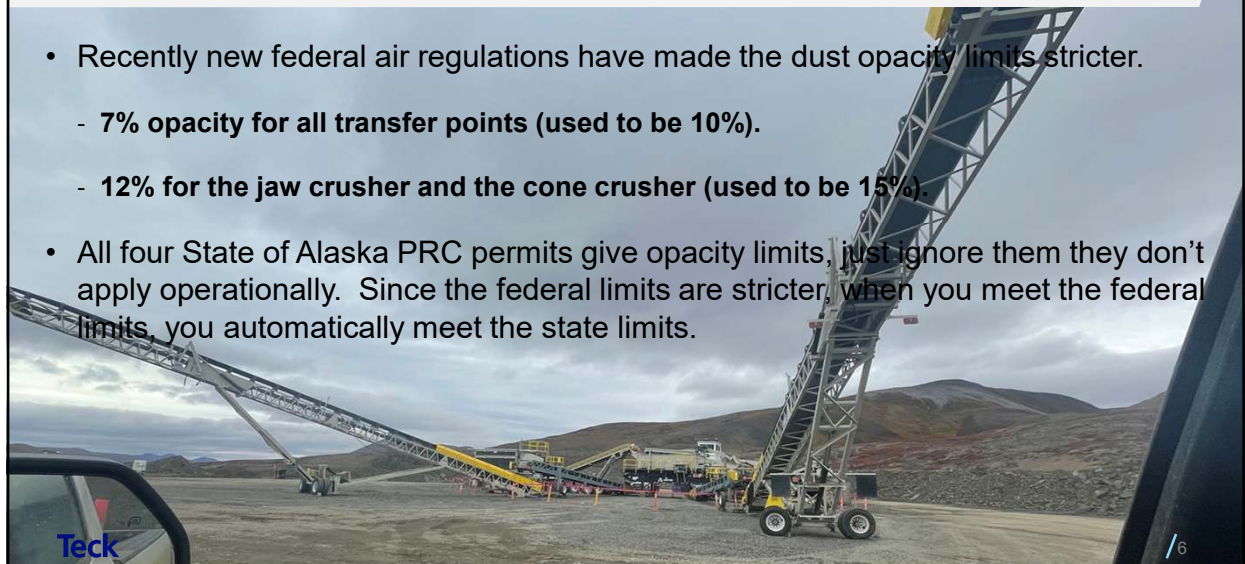
Teck Alaska Incorporated - Red Dog Operations						
40 CFR 60 Subpart OOO - Portable Rock Crusher Inventory						
Teck Equipment Number	MI Description	Rated Capacity	MFG	Serial #	Model	Startup Date
94-107	800KW CUMMINS QSK23 PORTABLE CRUSHER	800 kW	Cummins	321930	QSK23	9/1/2022
34-33	JAW CRUSHER PLANT PORTABLE CRUSHER	400 tons per hour (TPH)	KPI-JCI	PC305543522	3055	9/1/2022
34-41	VIBRATING GRIZZLY FEEDER PORTABLE CRUSHER	400 TPH	KPI-JCI	419742		9/1/2022
34-35	3055 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KPI-JCI	419741	3055	9/1/2022
34-34	JCI CONE PLANT PORTABLE CRUSHER	400 TPH	KPI-JCI	P222166	K350+PM	9/1/2022
34-40	6x20 3 DECK SCREEN PORTABLE CRUSHER	400 TPH	KPI-JCI	S225721	6x20x3	9/1/2022
34-36	K350 CONE PORTABLE CRUSHER	400 TPH	Kodiak	C221669	K350+PM	9/1/2022
34-37	CONVEYOR - TRANSCO ROLL PAK (3) PORTABLE CRUSHER	400 TPH	Transco	3461	36X70	9/1/2022
34-38	CONVEYOR - VALE RADIAL STACKER #1 PORTABLE CRUSHER	400 TPH	Vale	220780	36"X100'	9/1/2022
34-39	CONVEYOR - VALE RADIAL STACKER #2 PORTABLE CRUSHER	400 TPH	Vale	210741	36"X100'	9/1/2022

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New Federal Air Permit Requirements Federal Subpart OOO Opacity Requirements

- Recently new federal air regulations have made the dust opacity limits stricter.
 - **7% opacity for all transfer points (used to be 10%).**
 - **12% for the jaw crusher and the cone crusher (used to be 15%).**
- All four State of Alaska PRC permits give opacity limits, just ignore them they don't apply operationally. Since the federal limits are stricter, when you meet the federal limits, you automatically meet the state limits.

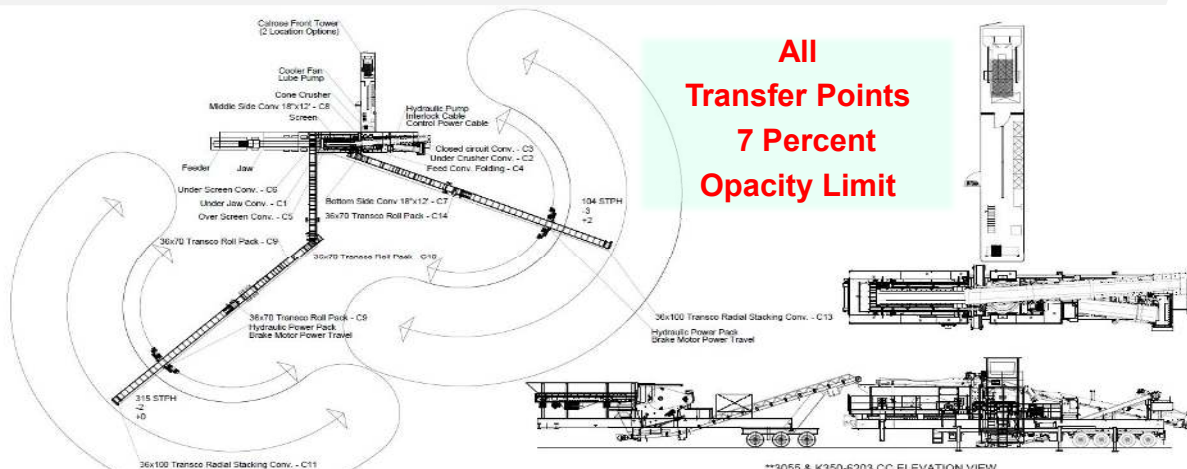


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New Federal Air Permit Requirements Federal Subpart OOO Opacity Requirements



New Federal Air Permit Requirements Federal Subpart OOO Opacity Requirements



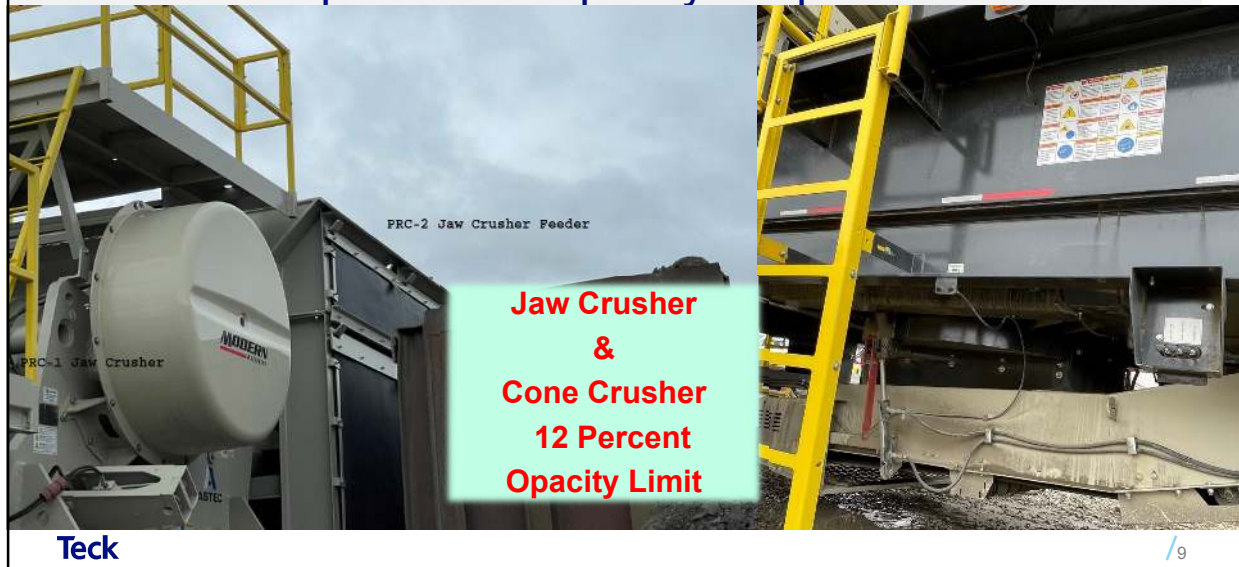
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DESIGNED BY	DATE	REVIEWED BY	DATE
DRAWN BY	DATE	REVIEWED BY	DATE
CHECKED BY	DATE	REVIEWED BY	DATE
APPROVED BY	DATE	REVIEWED BY	DATE

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New Federal Air Permit Requirements Federal Subpart OOO Opacity Requirements



More Federal Requirements Record Keeping

Portable Crushing Plant Inspection Report

- Operators need to record all steps taken to reduce dust and manage PM emissions.
- Record the date, time, location and description of actions taken to control PM emissions.
- If dust is observed, corrective actions must be initiated within 24 hours and they must be completed as expeditiously as possible.
- Record if spray nozzles are not in use because of **rain**.

Portable Rock Crusher

Mine Site

Permit AQ290TVP03, Revision 1

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PRC Mine Specific Requirements

Crush Only Wet Material

Use spray nozzles only if wetting is insufficient from the following:

- Material being wet due to ambient or naturally occurring conditions such as rain; or
- Material being wet due to water spraying prior to being fed into the rock crusher.
- If dust is observed at any time, apply more water to the crusher operations.



Jaw Crusher



Cone Crusher

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PRC Mine Specific Requirements

Condition 96.8 – Prevent Dust

Reasonable Precautions to Prevent Dust

- Cleanup loose material on work surfaces;
- Minimize drop distances on conveyor systems and lowering loader buckets to be in contact with the surface of the soil or ground before dumping.

Teck • Application of water or chemicals to road surfaces.

Port Road Portable Rock Crusher & AAEP

Permit AQ0289MG901

Permit AQ1720MG901

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Port Road / AAEP Specific Requirements

Generator Engine Location



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MGX-101 Non Road Engine

Location Restriction:

Cannot operate within 400 feet of the nearest occupied structure off the work site.

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Port Road / AAEP Specific Requirements

Generator Engine Notifications

Notifications:

- Environmental before relocation.
- If unexpected maintenance or repair is required, Environmental must notify ADEC within 24 hours of relocating the crusher to a storage location.



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Port Road / AAEP Specific Requirements

Recordkeeping

- List of equipment installed, removed, and operated.
- Make, model, and rated capacity of equipment operated.
- This includes any rental equipment.
- Log of non-road engines (MGX-101/Cat C27Generator) including date and location, make, model, serial number, and rated capacity.
- Non-operating storage status keep a log of the equipment, if moved offsite, location onsite, if collocated with stationary equipment, and returned to service.
- Maintain maintenance records.

Teck Alaska Incorporated - Red Dog Operations 40 CFR 60 Subpart QQQ - Portable Track Crusher Inventory						
Teck Equipment Number	MT Description	Rated Capacity	MPG	Serial #	Model	Startup Date
04-007	800W CUMMINS QSR22 PORTABLE CRUSHER	800 TPH	Cummins	3228936	CS423	9/1/2022
04-03	JAW CRUSHER PLANT PORTABLE CRUSHER	400 tons per hour (TPH)	KOMATSU	PL3070-0102	3075	10/1/2022
04-02	VIBRATING GRZELLY FEEDER PORTABLE CRUSHER	400 TPH	KOMATSU	429742		9/1/2022
04-05	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429741	3055	9/1/2022
04-04	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429742	3055	9/1/2022
04-06	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429742	3055	9/1/2022
04-07	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429742	3055	9/1/2022
04-08	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429742	3055	9/1/2022
04-09	3053 JAW CRUSHER PORTABLE CRUSHER	400 TPH	KOMATSU	429742	3055	9/1/2022

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Port Road / AAEP Specific Requirements

Operator's Requirements

- Copy of manufacturer's manual or operators procedures.
- Follow the **Fugitive Dust Control Plan**.

Operator Fugitive Dust Corrective Actions:

- Cleanup loose material,
- Minimizing drops,
- Application of water or chemicals,
- Stopping activity during high winds,
- Measures to prevent carryout or trackout of dust or mud by trucks.

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Port Portable Rock Crusher

DMTS Port Facility
Permit AQ0289TV03

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Port Specific Requirements

Opacity

- 12% at the jaw and cone crushers
- 7% transfer points
- Dumping directly into crusher has no opacity limits.

Particulate Matter

- Do not exceed 0.05 grains per standard cubic foot.

Example of Noncompliant Rock Crushing




Out of Compliance!

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Port Specific Requirements



Dust Control Plan:

- A dust control plan is required if the crusher is located within 2,000 feet of the nearest offsite structure.

DMTS Road Fugitive Particulate Matter Emission Control Plan

This plan is designed to minimize fugitive particulate matter emissions from the DMTS road. The application of calcium chloride has proven to be very effective in controlling fugitive particulate matter emissions from the DMTS road. Accordingly, calcium chloride will continue to be the primary fugitive particulate matter emission control agent used on the DMTS road.

The initial road treatment will be completed using one of two methods. The first method includes the following steps.

1. The road surface will be scarified to a depth of 4 to 6 inches.
2. Calcium chloride pellets will be spread onto the road.
3. Water will be applied to the road immediately following pellet application.
4. The application will be blade mixed into the road material.
5. The road surface will be shaped and compacted.

The alternate method includes these following steps.

1. The road surface will be scarified to a depth of 4 to 6 inches.
2. An aqueous solution of calcium chloride will be sprayed onto the road.
3. The solution will be blade mixed into the road material.
4. The road surface will be shaped and compacted.

Regardless of the initial application methodology, "touch-up" applications will be sprayed directly onto the finished road surface, as necessary, to minimize fugitive particulate matter emissions.

The planned total calcium chloride treatment for the initial application is 1.27 pounds per square yard, resulting in a total application of 600 tons of calcium chloride over the entire 52 mile road length. If the calcium chloride is applied as a liquid, the 30 percent solution will be prepared in lined mixing pits and transported by tanker truck.

Each calendar year, the initial road treatment will begin as soon as road and weather conditions allow, typically in late May. The initial application should be completed by early July, with "touch-up" applications continuing throughout the summer and fall, as needed, until freezing weather prohibits this activity. The "touch-up" applications will be at an application rate of 0.5 pounds of calcium chloride per square yard. The cumulative effect of the calcium chloride is anticipated to extend the effectiveness of the treatment into the winter months.

Lignon sulphate may be further tested to determine the effectiveness of this material in controlling fugitive particulate matter emissions.

Port Specific Requirements



Reasonable Precautions to Prevent Dust

- Cleanup loose material on work surfaces;
- Minimize drop distances on conveyor systems and lowering loader buckets to be in contact with the surface of the soil or ground before dumping.
- Application of water or chemicals to road surfaces.

Visible Emission Requirements

Mine Site		Port Site		DMTS Road	
DD2 or Mine Pit		MS-2		MS-9	
When		When		When	
M9 Due Within 2 days of startup or after relocating the crusher				M9 Due Within 2 days of startup at the beginning of the season or after relocating the crusher	
Frequency		Frequency		Frequency	
M9 Required Once Every 60 Days of Operation				Within the first 2 days of production each calendar month.	
Conditions		Conditions		Conditions	
If the Crusher Shuts Down:		If the Crusher Shuts Down:		Regardless of shut down or Start up	
<5 days: and is not relocated, resume counting the 60 days		and starts back up AND is not relocated : resume counting the 60 days		Within the <u>first 2 days of production</u> each calendar month	
>5 days: M9's must be completed within 24 hours of start up					
Opacity Limit		Opacity Limit		Opacity Limit	
10% PRC3-PRC-6, PRC 8-PRC-11		20%		20%	
15% PRC 2 & PRC-7					
# of Observation Points Required		# of Observation Points Required		# of Observation Points Required	
M9's are required at ALL points capable of producing fugitive emissions				M9's required at the highest emission point	
Diesel Engine		Diesel Engine		Diesel Engine	
No observation Required on start or anytime after at these locations				M9 Due Within 2 days of startup after relocating the crusher	
				M9 Required Once Every 30 Days of Operation	

- Method 9: All observations must be at least 18 minutes.
- Conduct Observation During Regular operation, Not in idle or reduced loads
- If a 6 minute opacity is observed as greater than **20%**, Report as excess emissions, take corrective actions as appropriate
- Use the Portable Rock Crusher VEE M9 Source Book, as well as the Portable Rock Crusher M9 VEE form

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Air Quality Permit Portable Rock Crusher Operator Quiz

		Date:	
Printed Name	Signature		PIN#

1. The Portable Rock Crusher is regulated under _____ different Air Quality permits.
2. The permit opacity requirements change according to where the Portable Rock Crusher is located.....
TRUE FALSE
3. Opacity limits for all transfer points is 7% and 12% at the Jaw and Cone Crushers.....
TRUE FALSE
4. When dumping rock directly into the Jaw Crusher, opacity cannot exceed 30%.....
TRUE FALSE
5. Particulate Matter emissions from the Portable Rock Crusher when located at the Mine cannot exceed _____ grains/standard cubic foot.
6. It is federally required to inspect the crushing operation and provide documentation of the inspections. Included on the inspection is:
A. Date, time, location, and description of steps taken to control dust and PM emissions.
B. When corrective actions were initiated (must be within 24 hours of dust observations).
C. Record is spray nozzles were not used due to rain events.
7. You may be required to enter data on the Portable Crushing Plant Inspection Report weekly.
TRUE FALSE
8. The Port Road and AAEP have the same exact permit conditions for operating the Portable Rock Crusher.
TRUE FALSE
9. Name three things to help prevent dust when Portable Rock Crusher is operating at the Mine.
a. _____
b. _____

c. _____

10. Federal Opacity Limits for the Portable Rock Crusher
(Choose correct opacity percentage: 7% or 12% or N/A)

Jaw Crusher	
Transfer Point Belt Conveyors (jaw crusher to primary conveyor)	
Transfer Point Belt Conveyor (primary conveyor to deck screen)	
Three Screen Deck	
Crusher Cone	
Transfer Point Belt Conveyor (deck screen conveyor to radial stacker)	
Trucks dumping rock into the Rock Crusher	

11. On the Port Road, the Portable Rock Crusher must be at least 400 feet from the nearest occupied structure. TRUE FALSE

12. If there is excess dust occurring on the road, Rock Crusher Operators need to notify _____ or _____, or the _____ at the Port, to deal with the issue.

13. Name three corrective actions a Rock Crusher Operator can do to control fugitive dust:

- _____
- _____
- _____

14. When the Rock Crusher is working at the at the Port Facility, the same Opacity and PM limits, as well as fugitive dust control requirements, are the same as they are at the Mine site. TRUE FALSE

15. Visible Emissions Observations are triggered by a number of different events. There is a summary "Cheat Sheet" for Operators to help coordinate the required observations with Environmental.
TRUE FALSE

Quiz Review

Getting it Right

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Quiz Review

1

The Portable Rock Crusher is regulated under ____ different Air Quality permits.

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2

The permit opacity requirements change according to where the Portable Rock Crusher is located.

False

3

Opacity limits at all transfer points is 7% and 12% at the Jaw and Cone Crushers

True

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Quiz Review

4

When dumping rock directly into the Jaw Crusher, opacity cannot exceed 30%.

False; There is no opacity limit when dumping rock directly into the crusher.

5

Particulate Matter emissions from the Portable Rock Crusher when located at the Mine cannot exceed _____ grains/standard cubic foot.

0.05 grains/
standard cubic
foot

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Quiz Review

6

It is federally required to inspect the crushing operation and provide documentation of the inspections. Included on the inspection is: (check correct answers):

A, B, and C

7

You may be required to enter data on the Portable Crushing Plant Inspection Report weekly.

False; Reports are filled out daily.

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Quiz Review

8

The Port Road and AAEP have the same exact permit conditions for operating the Portable Rock Crusher.

True

9

Name three things to help prevent dust when Portable Rock Crusher is operating at the Mine.

- a. Clean up loose material.
- b. Minimize drop distances.
- c. Apply water or chemicals to roads.

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Quiz Review

10. Federal Opacity Limits for the Portable Rock Crusher (Choose correct opacity percentage: 7% or 12% or N/A)

Jaw Crusher	12%
Transfer Point Belt Conveyors (jaw crusher to primary conveyor)	7%
Transfer Point Belt Conveyor (primary conveyor to deck screen)	7%
Three Screen Deck	7%
Crusher Cone	12%
Transfer Point Belt Conveyor (deck screen conveyor to radial stacker)	7%
Trucks dumping rock into the Rock Crusher	N/A

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Quiz Review

11

On the Port Road, the Portable Rock Crusher must be at least 400 feet from the nearest occupied structure.

True

12

If there is excess dust occurring on the road, Rock Crusher Operators need to notify _____ or _____, or the _____ at the Port, to deal with the issue.

Surface or Environmental or the Hopper Crew at the Port.

13

Name three corrective actions a Rock Crusher Operator can do to control fugitive dust:

- a. Cleanup loose material.
- b. Minimize drops.
- c. Application of water.
- d. Stop during high winds.
- e. Prevent trackout.

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Quiz Review

14

When the Rock Crusher is working at the at the Port Facility, the same Opacity and PM limits, as well as fugitive dust control requirements, are the same as they are at the Mine site.

True

15

Visible Emissions Observations are triggered by a number of different events. There is a summary "Cheat Sheet" for Operators to help coordinate the required observations with Environmental.

True

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Need Air Permit Info for Portable Rock Crushers?

Questions?

Call or Email Environmental
Environmental.reddog@teck.com

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