Appendix O-1

Operation and Maintenance Plans for Particulate Control

Appendix O-1: Operation and Maintenance Plans for Particulate Control
[Rule 62-296.700(6)(e), F.A.C.]

Emission Unit No. 002 – Railcar Unloading

a. Process Parameters:
   1. Source Designator: Railcar Unloading
   2. Scrubber Manufacturer: IMC-Agrico Company (1992) and Amerex (1995)
   3. Model Name and Number: Amerex Type C Venturi
   4. Design Flow Rate: 100,000 ACFM
   5. Efficiency Rating at Design Capacity: 99.6%
   6. Scrubber Inlet Pressure: 4.0" minimum (2.0" minimum GTSP,MAP, DAP,AFI)
   7. Liquid to Gas Ratio: 3.5 gpm/1000 ACFM
   8. Scrubber Liquor: Deep Well Water (brackish) or Recycle
   9. Liquor Feed Rate: 600 gpm
   10. Water Make Up Rate: 100%
   11. Gas Flow Rate: 80,000 - 110,000 ACFM
   12. Gas Temperatures: Inlet; 70-120 °F.; Outlet; 60-110 °F.
   13. Stack Height Above Ground: 65 ft.
   14. Exit Diameter: 6 ft.
   15. Fan(s) Current at Rated Voltage: I.D. 58 amp
   16. Water Vapor Content: 1.0 - 5.5%
   17. Process Controlled by Collection System: Material Handling of: Phosphate Rock (Various Grades and Blends), Chemicals (DAP, MAP, GTSP and AFI)
   18. Material Handling Rate: Phosphate Rock - 1800 TPH, All Other Materials - 1250 TPH
   19. Operation Schedule: 6570 hrs./year

b. Observations, checks and operations apply to this source and shall be conducted on the schedule specified:

   Daily
   1. Scrubber Inlet pressure.
   2. Check for visible emissions from source and associated points..
   3. Evacuation effectiveness.
   4. Fan and Motor.
   5. Sump Pump and Motor.
   6. Supply Water Pressure.

   Annually
   1. Clean Scrubber Sprays.

Emission Unit Nos. 003 and 013 – Shiploading Operation (C13 to C14) and Shiphold Loading (C14 to telescopic chute)

a. Process Parameters:

1. Source Designator: C13 to C14 and C14 to telescopic chute
2. Baghouse Manufacturer: General Electric
3. Model Name and Number: R-08-128-108
4. Design Flow Rate: 9,000 DSCFM
5. Efficiency Rating at Design Capacity: 99+%
6. Pressure Drop: 0" - 8" w.g.
7. Air to Cloth Ratio: 4.8 to 1.0
8. Bag Weave: Felt
9. Bag Material: Teflon Coated Polyester, 16 oz.
10. Number of Filters: 128
11. Rows: 8
12. Bag Cleaning Conditions: Pulse-Jet; Air Pressure: 90 psig minimum
13. Gas Temperatures: Inlet and outlet (minimum): Ambient
14. Stack Height Above Ground: 33 ft.
15. Exit Diameter: 3 ft.
16. Exit Velocity: 24 f.p.s.
17. Water Vapor Content: Ambient
18. Process Controlled by Collection System: C13 to C14 and C14 to telescopic chute.
19. Material Handling Rate: 2,300 TPH maximum
20. Operation Schedule: 6,570 hrs./year

b. Observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

Daily

1. Check and record Pressure Drop.
2. Check for visible emissions from source and associated emission points.
3. Check Evacuation effectiveness.
4. Check and record Air Supply Pressure.
5. Walk through system listening for proper operation (audible leaks, proper fan and motor functions, bag cleaning systems, etc.)
6. Check fan for dust emissions.

Monthly

1. Check solenoids and diaphragm valves.
2. Check the dust suppression system to ensure proper operation.
3. Check fan bearings.
4. Check door seals.
5. Unplug hopper if necessary. Check rotary valves.
6. Check all lubrication.
7. Check duct condition (inlet and outlet).
8. Check dampers for proper operation.

9. Check Screw Conveyor, Motor, and Discharge Valves for proper operation.

Quarterly

1. Check floor plates.
2. Inspect fans for corrosion and material build-up.
3. Inspect baffle plates for wear.
4. Thoroughly inspect bags.
5. Check ducts for dust build-up.
6. Inspect paint condition.
7. Check screw conveyor flighting.
8. Check all bolts.
9. Check welds.
10. Inspect hopper for wear.
11. Check dampers for proper seating.
12. Check the alignment of clean air pipes.
13. Check the bag tension.
14. Check the bag seating.

Emission Unit No. 004 – C17 Transfer Point E (C17 to C18 or C17 to C19)

a. Process Parameters:
   1. Source Designator: C17 Conveyor Transfer Point E
   2. Scrubber Manufacturer: Poly-Con
   3. Model Name and Number: Venturi 1506MS, scrubber0
   4. Design Flow Rate: 6,000 ACFM
   5. Efficiency Rating at Design Capacity: <0.03 grains/dscf
   6. Pressure Drop: 5 in. of water minimum
   7. Liquid to Gas Ratio: 16.7 gpm/1000 ACFM
   8. Scrubbing Liquor Composition: Recycle water
   9. Liquor Feed Ratio: 100 gpm
   10. Liquor Feed Solutions and Undissolved Solids Content: Approximately 1-2%
   11. Water Makeup Rate: 10-15 gpm
   12. Fan(s) Current at Rated Voltage: 40 hp, 52 amp. N.P.
   13. Pump(s) Current at Rated Voltage: 3 hp, 4.8 amp. N.P.
   14. Gas Flow Rate: 6000 SCFM
   15. Gas Temperatures Inlet and Outlet (minimum): Ambient - 120° F.
   16. Stack Height Above Ground: 5 ft.
   17. Exit Size: 16 in. x 16 in.
   18. Exit Velocity: 56 f.p.s.
   19. Water Vapor Content: 5%
   20. Process Controlled by Collection System: Conveyor transfer point to railcar unloading facility
   21. Material Handling Rate:
       i) 1800 TPH for phosphate rock
       ii) 1250 TPH for all other products
   22. Operation Schedule: 8760 hrs./year

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

   Daily
   1. Pressure Drop
   2. Check for Visible emissions from source and associated points.
   3. Evacuation Effectiveness
   4. Duct Sprays
   5. Fan and Motor
   6. Pump and Motor
   7. Makeup Water Valve
   8. Discharge Water Flow

Emission Unit No. 005 – C12 Transfer Point A (C12 to C13)

a. Process Parameters:
   1. Source Designator: C12 Conveyor Transfer Point A
   2. Baghouse Manufacturer: Mikro-Pulsaire
   3. Model Names and Number: Model 80F2
   4. Design Flow Rate: 8,000 ACFM
   5. Efficiency Rating at Design Capacity: 0.02 grains/dscf
   6. Pressure Drop: 0" - 10" of water
   7. Air to Cloth Ratio: 5.3
   8. Bag Weave: Felt
   9. Bag Material: Polyester
   10. Bag Cleaning Conditions, Pulse Air Pressure: 100 psig
   11. Gas Flow Rate: 8000 SCFM estimated
   12. Gas Temperatures Inlet and Outlet (minimum): Ambient - 130° F.
   13. Stack Height Above Ground: 32 ft.
   14. Exit Size: 18 in. x 18 in.
   15. Exit Velocity: 60 f.p.s.
   16. Water Vapor Content: 3%
   17. Process Controlled by Collection System: Conveyor transfer point to ship loading facility
   18. Material Handling Rate: 2300 tons per hour
   19. Operation Schedule: 6570 hrs./year

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

   Daily
   1. Pressure Drop
   2. Check for Visible emissions from source and associated points.
   3. Evacuation Effectiveness
   4. Air Supply Pressure
   5. Pulse Operation
   6. Fan and Motor
   7. Screw Conveyor and Motor
   8. Air Lock and Motor

   Monthly
   1. Solenoids and Diaphragm Valves
   2. Bag Condition

Emission Unit No. 006 – C30 Transfer Point C (C30 to C12)

a. Process Parameters:

1. Source Designators: C30 Conveyor Transfer Point C
2. Baghouse Manufacturer: Mikro-Pulsaire
3. Model Name and Number: Model 1215-8-80
4. Design Flow Rate: 6,000 ACFM
5. Efficiency Rating at Design Capacity: 0.02 grains/dscf
6. Pressure Drop: 0" - 10" of water
7. Air to Cloth Ratio: 5.3
8. Bag Weave: Felt
9. Bag Material: Polyester
10. Bag Cleaning Conditions, Pulse Air Pressure: 100 psig
11. Gas Flow Rate: 6000 SCFM estimated
12. Gas Temperatures Inlet and Outlet (minimum): Ambient - 130° F.
13. Stack Height Above Ground: 27 ft.
14. Exit Size: 12 in. x 12 in.
15. Exit Velocity: 66 f.p.s.
16. Water Vapor Content: 3%
17. Process Controlled by Collection System: Conveyor transfer point Ship Loading Facility
18. Material Handling Rate: 2300 tons per hour
19. Operation Schedule: 6570hrs./year

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

Daily

1. Pressure Drop
2. Check for Visible emissions from source and associated points.
3. Evacuation Effectiveness
4. Air Supply Pressure
5. Pulse Operation
6. Fan and Motor
7. Screw Conveyor and Motor
8. Air Lock and Motor

Monthly

1. Solenoids and Diaphragm Valves
2. Bag Condition

Emission Unit No. 007 – C18 Transfer Point D (C18 to C12)

a. Process Parameters:

1. Source Designator: C18 Conveyor Transfer Point D
2. Baghouse Manufacturer: Mikro-Pulsaire
3. Model Name and Number: Model 1215-8-80
4. Design Flow Rate: 6,000 ACFM
5. Efficiency Rating at Design Capacity: 0.02 grains/dscf
6. Pressure Drop: 0" - 10" of water
7. Air to Cloth Ratio: 5.3
8. Bag Weave: Felt
9. Bag Material: Polyester
10. Bag Cleaning Conditions, Pulse Air Pressure: 100 psig
11. Gas Flow Rate: 6000 SCFM estimated
12. Gas Temperatures Inlet and Outlet (minimum): Ambient - 130° F.
13. Stack Height Above Ground: 40 ft.
14. Exit Size: 12in. x 12 in.
15. Exit Velocity: 95 f.p.s.
16. Water Vapor Content: 3%
17. Process Controlled by Collection System: Conveyor transfer point to Ship Loading Facility
18. Material Handling Rate:
    i) 1800 TPH for phosphate rock
    ii) 1250 TPH for all other materials
19. Operation Schedule: 6570 hrs./year

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

Daily

1. Pressure Drop
2. Check for Visible emissions from source and associated points.
3. Evacuation Effectiveness
4. Air Supply Pressure
5. Pulse Operation
6. Fan and Motor
7. Screw Conveyor and Motor
8. Air Lock and Motor

Monthly

1. Solenoids and Diaphragm Valves
2. Bag Condition

Emission Unit No. 008 – Material Handling and Storage Silos

a. Process Parameters:

1. Source Designator: Animal Feed Ingredient Handling
2. Baghouse Manufacturer: Mikro-Pulsaire
3. Model Name and Number: Model 49S-8-20
4. Design Flow Rate: 3565 ACFM (3540 scfm)
5. Efficiency Rating at Design Capacity: <0.02 grains/dscf
6. Pressure Drop: 0" – 6" of water
7. Air to Cloth Ratio: 6.5:1
8. Bag Weave: Felt
9. Bag Material: Polyester
10. Bag Cleaning conditions, pulse air pressure: 100 psig
11. Gas Flow Rate: 3200 ACFM
12. Gas temperatures inlet and outlet (minimum): 100-130 °F.
13. Stack Height above ground: 97 ft.
14. Exit Diameter: 12 in. x 12 in.
15. Exit Velocity: 59.5 f.p.s.
16. Water Vapor Content: Ambient
17. Process controlled by collection system: material handling of animal feed ingredients
18. Material Handling Rate: Maximum 120 tons per hour
19. Operation Schedule: 2,500 hours per year.

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified:

Daily

1. Pressure Drop
2. Check for Visible emissions from source and associated points.
3. Evacuation Effectiveness
4. Air Supply Pressure
5. Pulse Operation
6. Fan and Motor

Monthly

1. Solenoids and Diaphragm Valves
2. Bag Condition

Emission Unit No. 009 – C19 Transfer Point G (C19 to C38)

a. Process Parameters:

1. Source Designator: C19 Conveyor Transfer Point G
2. Baghouse Manufacturer: Mikro-Pulsaire
3. Model Name and Number: 1215-8-80
4. Design Flow Rate: 5,000 ACFM
5. Efficiency Rating at Design Capacity: 0.02 grains/dscf
6. Pressure Drop: 0" - 10" of water
7. Air Cloth Ratio: 5.3
8. Bag Weave: Felt
9. Bag Material: Polyester
10. Bag Cleaning Conditions, Pulse Air Pressure: 100 psig
11. Gas Flow Rate: 4200 SCFM estimated
12. Gas Temperatures Inlet and Outlet (minimum): Ambient - 130° F.
13. Stack Height Above Ground: 93 ft.
14. Exit Diameter: 16 in.
15. Exit Velocity: 54 f.p.s.
16. Water Vapor Content: 2%
17. Process Controlled by Collection System: Conveyor transfer point C19 to C38 to rail unloading facility
18. Material Handling Rate: Maximum 1250 tons per hour
19. Operation Schedule: 6570 hrs./year

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified and records kept on the same:

Daily

1. Pressure Drop
2. Check for Visible emissions from source and associated points.
3. Evacuation Effectiveness
4. Air Supply Pressure
5. Pulse Operation
6. Fan and Motor
7. Air Lock and Motor

Monthly

1. Solenoids and Diaphragm Valves
2. Bag Condition

Emission Unit No. 012 - Railcar Transfer to Storage Silos (C19 to C38)

a. Process Parameters:

1. Source Designators: Dry Phosphate Rock Transfer and Storage System with Scrubber
2. Baghouse Manufacturer: Ducon
3. Model Name and Number: Venturi Oriclone, VVO 36/84
4. Design Flow Rate: 25,000 CFM
5. Efficiency Rating at Design Capacity: 0.03 grains dscf
6. Pressure Drop: 0" - 9" of water
7. Liquid to Gas Ratio: 8 gpm/1000 ACFM
8. Scrubbing Liquor Composition: Recycle water
9. Liquor Feed Rate: 290 gpm minimum
10. Liquor Feed Solutions and Undissolved Solids Content: Approximately 1-2%
11. Water Makeup Rate: 20-35 gpm
12. Fan(s) Current Rated Voltage: 75 hp., 100 amp. N.P.
13. Pump(s) Current at Rated Voltage: 10 hp, 13 amp. N.P.
14. Gas Flow Rate: 23,100 SCFM
15. Gas Temperatures: inlet and outlet (minimum): Ambient - 120° F
16. Stack Height Above Ground: 12 ft.
17. Exit Diameter: 24 in. x 28 in.
18. Exit Velocity: 90 f.p.s.
19. Water Vapor Content: 3%
20. Process Controlled by Collection System: Conveyor transfer points from Railcar Unloading Facility to Storage Silos
21. Material Handling Rate: Railcar unload 1,250 TPH
22. Operation Schedule: 6570 hrs./yr.

b. The following observations, checks and operations apply to this source and shall be conducted on the schedule specified.

Daily

1. Pressure Drop
2. Check for Visible emissions from source and associated points.
3. Evacuation Effectiveness
4. Dust Sprays
5. Fan and Motor
6. Pump and Motor
7. Makeup Water Valve
8. Discharge Water Flow

Emission Unit No. 100 – Truck and Railcar Unloading Station No.2 and Transfer Points (C2, C3, C4, C7, C11, C94) in Storage Building Nos. 1 and 2

No Control Device

The following observations, checks and operations apply to this source and shall be conducted on the schedule specified:

Weekly

1. Check and record each exhaust for visible emission.

Monthly

1. Check conveyor transfer systems and bucket elevator for visible leaks and cracks.

Emission Unit No. 102 – Truck Unloading Station No. 1 and Transfer Point (C82 to C83)

No Control Device

The following observations, checks and operations apply to this source and shall be conducted on the schedule specified:

Weekly

1. Check and record each exhaust for visible emission.

Monthly

1. Check the conveyor transfer systems for visible leaks and cracks.

Emission Unit No. 103 – Transfer Points (C83, C84 and C104) in Storage Building No. 3

No Control Device

The following observations, checks and operations apply to this source and shall be conducted on the schedule specified:

Weekly

1. Check and record each exhaust for visible emission.

Monthly

1. Check the conveyor transfer systems for visible leaks and cracks.