Fugitive Dust Control Plan

Sherburne County Generating Plant

Original Publication: September 2015
Review No. 4: October 2019
Revision No: 0

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Annual Review Log

Review No.	Review Date	Any Revisions Needed?*	Notes
1	November 3, 2016	No	There were no changes at the facility since the first publication on September 15, 2015 that would require a revision to the Plan.
2	October 2, 2017	No	There were no changes since the last Plan review that would require a revision to the Plan.
3	October 4, 2018	No	There were no changes since the last Plan review that would require a revision to the Plan.
4	October 22, 2019	No	There were no changes since the last Plan review that would require a revision to the Plan.

** A revision to the Fugitive Dust Control Plan is required whenever there is a change in conditions at the facility that would substantially affect the Plan.*

Revision Log

Revision No.	Revision Date	Revised Sections	Notes
0	September 1, 2015	NA	Original Publication

Certification of Report

The report shall be prepared, signed and sealed by a professional engineer.

"I hereby certify that this plan meets the requirements of the Coal Combustion Residual Rules (40 CFR Subpart D 257.80)."

Print name: John R. McCain

Signature:

Date: 09/25/2015

License#: MN 21835

1 Introduction

Controlling fugitive dust at the Sherburne Country Generating Plant (Sherco) is addressed through a fugitive dust control program. Sherco is required to establish a Fugitive Dust Control Plan (Plan) and follow it at all times. The Plan is required both by Sherco's Air Quality Permit No. 14100004-004 and also by the newly published Coal Combustion Residual (CCR) Rules (40 CFR Subpart D 257.80). Each aspect of the Plan has been specifically designed to outline measures that will minimize airborne dust at the plant. The Plan includes activities such as the aggressive watering of roads and work areas, along with the observation of changes in meteorological conditions and the following of processes and procedures intended to minimize dust, among many others. The Sherco staff is actively engaged in dust control on a continuous basis. The Plan is a formal statement of the activities and the methods employed specifically designed to minimize the creation of airborne dust and it meets all of the applicable requirements of both the Air Quality Permit and the CCR Rules.

All of the control measures in place have proven to be extremely effective in the prevention or control of airborne fugitive dust. Each measure has been carefully planned and executed based on site-specific operating conditions in order to receive the maximum benefit. These are outlined in the sections below. Watering is the main process that is conducted to control fugitive dust from the coal yard, CCR storage ponds (ponds), the Unit 3 Landfill (landfill) and the plant roads. Additional control measures are also in place for each of these areas and are also described in the sections below.

2 Fugitive Dust Control – Watering

2.1 Overview

One of the primary controls for fugitive dust is the aggressive watering of the coal yard, landfill and ponds which are exposed to inclement weather, specifically dry and windy conditions. Included in these areas are the plant roads which are potentially a large contributor to the generation of fugitive dust. Meteorological data is tracked by Sherco Supervisors and the watering process is triggered by certain criteria; however no water application is required when temperatures are below freezing as described in further detail below. The following explains the process of controlling dust in these areas by the use of water. The attached site map illustrates all of these areas of the facility.

2.2 Watering Equipment

Sherco owns three 10,000 gallon water wagons equipped with front and rear spray nozzles. The normal application rate is approximately 1,000 gallons per minute at a speed of approximately 12 miles per hour. The spray effectively waters a 25-foot wide strip. One pass equals approximately 1.6 L/m^2, or 7.6 hours of wetness based on an air quality modeling analysis. Additionally, a 3,500 gallon truck-mounted tank with side and rear spray nozzles is available should any of the main water wagons be out of service.

Maintenance records and hours of operation for dust control equipment are kept in the Mobile Equipment Record System. The system allows Sherco to monitor equipment operation and schedule preventative maintenance to avoid outages during critical periods.

2.3 Watering Areas

2.3.1 Plant Roads

As can be seen in the attached facility map, there are paved and unpaved roads at Sherco. The majority of the roads on the plant site are watered. The frequency depends on the meteorological conditions and the traffic rate.

2.3.2 Coal Yard

The coal yard encompasses approximately 100 acres of land devoted to coal storage, unloading, processing and reclaiming. Within this area, approximately one third is actively traveled by trucks, scrapers and front-end loaders. About half of the total coal yard area is considered open to wind erosion. The remaining acreage is covered by buildings or is positioned in that it is typically not subject to any or very minimal wind erosion.

2.3.3 CCR Storage Ponds

The active and future ponds receive material from three streams on a continuous basis: scrubber slurry from Units 1 and 2, bottom ash slurry from Units 1, 2 and 3 and trucks hauling CCR from metropolitan area coal plants for disposal at Sherco. Units 1 and 2 scrubber slurry is discharged directly into its final waste disposal pond, while bottom ash is continuously discharged into a separate pond for dewatering. Trucks carrying CCR from the metropolitan plants also are unloaded into the active scrubber pond and the CCR can be used for dike erosion protection and pond cap development. On an intermittent basis the ponds may receive CCR contaminated debris such as air heater boxes and other ash contaminated debris generated through routine plant maintenance activities.

2.3.4 Unit 3 CCR Landfill

The landfill is located to the northwest of the generating units. CCR from Unit 3 is pneumatically conveyed to the Unit 3 Ash Storage Silo where it is mixed with water, loaded into end-dump trucks and hauled a short distance to the landfill over a paved access road. Some of the CCR is loaded dry into tanker trucks at the ash storage silo for utilization off-site.

2.4 Watering Procedure

Watering for fugitive dust control is conducted when air temperatures are above freezing. It is governed primarily by the current and anticipated meteorological conditions. The control of the watering program is given to the Yard and Landfill Supervisors who estimate the dust generation potential based on relative humidity, temperature, wind conditions and rain events. Dry and windy days (when wind erosion is observed without activity in this area) watering begins during the night and continues prior to the first hauling or scraping activity. At other times, watering begins with the first shift in the morning, prior to any hauling or scraping activity. Watering is not conducted during precipitation events and is not normally reinitiated after a 0.1 inch rainfall for 12 hours, unless drying conditions dictate otherwise. Also, inactive areas, such as the landfill on weekends, are not watered unless fugitive dust is a problem on a particular day.

During very dry and windy conditions, the following is an example of the watering process:

1. Water wagons will be dispatched to the coal yard and landfill as needed during the night to water the area to be worked the next morning.
2. Water wagons are also dispatched to the ponds and landfill prior to the first shift to water the haul roads at least once.

3. During the first shift, watering begins on approximately the following basis (note that additional watering may occur depending on the activity in the area and the weather conditions):
    - Coal Yard Area – Approximately three water wagon loads are applied each hour for up to 15 hours per day.
    - Pond Area – Approximately two water wagon loads are applied during the morning and again during the afternoon.
    - Unit 3 Landfill – Approximately two or three water wagon loads are applied during the day to the perimeter haul road and the main haul road and up to eight loads to the active portion of the landfill.

During other times when it is not significantly dry or windy, Sherco Supervisors use their best judgment to ensure that proper watering is conducted to minimize fugitive dust. They utilize the meteorological conditions which are continuously recorded by an on-site weather monitor.

The records of the number of water wagon fills, along with the total gallon per trip are recorded in an electronic log. This log is reviewed each month and the proper records are kept on site at the facility.

2.5 Amount of Water Applied

The following table presents the average daily watering rates that can be anticipated under dry conditions when a precipitation event greater than or equal to 0.01 inches has not occurred prior to the beginning of a work day. The roads are included in the areas in which they serve.

APPROXIMATE WATERING RATES BY AREA	
Work Area	**Watering Rate (Gal/day)**
Coal Yard	400,000
CCR Storage Ponds	50,000
Unit 3 Landfill	100,000

2.6 Subfreezing Temperatures

Control of dust during periods of subfreezing temperatures is provided largely by natural processes. Snow cover controls dust during a large fraction of most winters. On some days without snow cover, adequate moisture exists from past snowfall or liquid precipitation to prevent fugitive dust. Snow or frozen surfaces effectively control wind erosion and vehicle traffic emissions. Additionally, to the extent practical, snow is moved from coal yard areas where snow cover is not needed to areas of activity. Additionally, attempts are made to try and limit the area being worked.

2.7 Record Keeping

Sherco can identify the time spent by its staff on watering. Also, maintenance records are kept on the water wagons to assure proper operation, as well as hours of daily use. Record keeping on watering includes the following information in a daily log:

- Date and Time of Each Water Wagon Fill
- Water Wagon ID Number
- Segment Watered
- Amount of Water Dispersed
- Operator's Employee ID Number
- Total Daily Water Usage by Area

In addition, daily meteorological data will be recorded for temperature, wind speed and precipitation. The watering records and the meteorological data will be retained for at least five years as required by the air quality permit. The template for these records is included in Appendix C.

3 Fugitive Dust Control – Plant Roads

3.1 Plant Road Overview

As can be seen in the attached facility map, there are numerous paved and unpaved roads at Sherco. One section of paved road extends from the area where CCR from the Unit 3 Ash Storage Silo is loaded into trucks and hauled to the landfill for disposal. Another length of paved road extends from just north of the Recycle Basin, down past the landfill and to the plant exit. Lastly, one small section of the pond areas has been paved in order to minimize the creation of airborne dust as many trucks travel through this area. All of the paved roads are identified in green on the attached map. Also illustrated in blue are numerous unpaved roads at the facility. The majority of the roads on the plant site are watered. The frequency depends on the meteorological conditions and the traffic rate.

3.2 Watering

As described in the previous section, the most effective process in controlling fugitive dust from the plant roads is the aggressive watering that is conducted, especially during dry and windy conditions. The frequency of the watering is driven largely by the meteorological conditions (or anticipated conditions) at the facility, which is tracked by Sherco Supervisors.

3.3 Sweeping of Paved Roads

The tracking of dirt from unpaved areas and CCR spillage are not extensive. A sweeper is used as needed and as weather permits, especially to clean up CCR that has carried over from the landfill or is on the road around the CCR silo building.

3.4 Speed Control

The speed at Sherco is limited to a maximum of 25 miles-per-hour and even slower in some higher traffic areas. By limiting speed, the fugitive dust generation is reduced significantly, especially from some of the larger equipment used at the facility.

3.5 Dust Suppression Chemicals

Sherco has the approval for a number of dust suppression chemicals to be applied to the plant roads as needed. These are approved through the NPDES permit No. MN0002186 as required. These are typically not utilized, but the option is available to control fugitive dust if the need ever arises.

4 Fugitive Dust Control – Coal Yard

4.1 Overview

In addition to the main fugitive dust control procedure of watering of the coal yard area, there are other processes in place that are used to minimize fugitive dust. These are outlined in the following sections.

4.2 Dust Suppression Chemicals

Approved dust suppression chemicals are utilized as needed in the coal yard. This can include the application to specific areas of the coal pile that are prone to the generation of fugitive dust or to the belts and feeders in order to keep the dust to a minimum as the coal is conveyed throughout the system.

4.3 Coal Unloading

When coal unloading takes place, there are a few control measures utilized as this process has the potential to create a significant amount of dust. The process occurs inside the building and a dust suppressant is applied during the unloading process in order to minimize the generation of dust created by the dumping of the coal from the train cars. Additionally, a dust collector is used to capture the majority of the coal dust generated.

4.4 Coal Handling

Water sprays and chemicals are used to treat the coal at the track hopper feeders and at the head of major conveyors. Almost all coal is thoroughly treated after unloading from rail cars and prior to stacking. Additionally, dust is reduced through various operating practices such as lowering the boom on the stacker-reclaimer to minimize the free fall of the coal.

4.5 Dust Collection Systems

Dust collection systems are in place at almost all processes within the coal yard. These systems exhaust the captured dust so that it does not become a source of fugitive dust when a door or window is opened in a building.

4.6 Speed Control

Similar to the speed limits in place on all of the plant roads, speed is kept to a minimum while transferring coal from one location to another in the coal yard, including on the coal pile.

5 Fugitive Dust Control – Scrubber Solids Ponds

5.1 Overview

In addition to the main fugitive dust control procedure of watering the pond areas, there are other processes in place that are used to minimize the formation of dust. These are outlined in the following sections.

5.2 CCR Transfer

The majority of the CCR that is transferred from Units 1, 2 and 3 is delivered wet by pipeline. This eliminates almost all of the fugitive dust generation due to the shipment of the waste to the ponds. However, there is some material that is transferred by truck from the process. An example of this are CCR waste or debris generated from plant maintenance activities. This material may be in a wet or dry state. These shipments are handled on an individual basis to ensure that the creation of fugitive dust is

avoided. Every attempt is made to cover the material, wet the material or to just drive slowly if no other alternative is available. When material is brought on-site from other Xcel Energy coal fired generating plants for disposal, Sherco staff is usually informed prior to the waste being placed by the ponds for disposal. This material is typically conditioned prior to transfer to prevent the risk of a release while traveling on public roads.

5.3 CCR Disposal

Every effort is made to dispose of the CCR as far from the property boundary as possible. A disposal pad located within the CCR pond is typically used as a staging area for miscellaneous CCR materials that will be disposed of in the pond; this location is outlined in the attached facility map. By placing the CCR in a centralized location, it minimizes any fugitive dust generated from reaching the facility boundary and exposing the public. This location allows for the material to have adequate time to settle out into the pond as well. If the material is particularity dry, every effort is made to push the waste into the pond as soon as possible. If this is not an immediate possibility, then other practices such as watering of the CCR is conducted to minimize the generation of dust until disposal can take place. This is especially important and taken into account during very dry and windy conditions.

5.4 Pond Capping

As the ponds reach the end of their useful life, they are dewatered and an engineered cap is installed. During the dewatering process free liquids are transferred to the active pond. Conditioned CCRs, sand and topsoil is used to achieve final contours so that the final cap has a sufficient slope to promote positive drainage. The final cap is comprised of a screened barrier layer, a geomembrane liner, followed by approximately one foot of drainage sand and one foot of top soil. Grass is then planted over the capped area. By capping these areas, risk of fugitive dust generation is nearly eliminated.

6 Fugitive Dust Control – Bottom Ash Pond

6.1 Overview

In addition to the fugitive dust control procedure of watering (typically only the roads in the bottom ash pond area), there are other handling processes in place that are used to minimize the formation of dust. These are outlined in the following section.

6.2 CCR Handling

All CCR that is transferred from Units 1, 2 and 3 is delivered wet by pipeline. This eliminates almost all of the fugitive dust generation due to the shipment of the waste to the bottom ash pond. Almost every year, the transfer of CCR from the bottom ash pond to the scrubber solids pond takes place. This material is always wet and there is very minimal risk of fugitive dust, except for travel on the roads. The roads are watered in accordance with the procedures outlined above.

7 Fugitive Dust Control – Unit 3 Landfill

7.1 Overview

In addition to the main fugitive dust control procedure of watering of the landfill area, there are other processes in place that are used to minimize the generation of dust. The overall operational procedure is based on placing and compacting the conditioned CCR so that stability, drainage and dust generation are avoided. These are outlined in further detail in the following sections.

7.2 CCR Conditioning

One of the most effective dust control measures for the CCR collected from unit 3 in the fabric filter bags is the addition of water to the CCR so that has an optimum moisture content so as to not release fugitive dust from the haul trucks while being transferred to the landfill or as it is placed on the landfill for disposal. The CCR is temporarily stored in two storage silos prior to the permanent disposal in the landfill. The storage silos are located 200 feet to the north of the fabric filter building. Water is added to the CCR to minimize dusting during transportation and disposal and also, very importantly, to facilitate compaction in the landfill. The moisture content of the conditioned CCR varies from approximately 15% to 25%. By limiting the moisture content, this will ensure that the conditioned CCR will not result in any free liquids during transportation and disposal. Occasionally Sherco will receive dry CCRs in tanker trucks from other Xcel Energy coal fired plants. When these trucks are received the contents are pneumatically unloaded into one of the storage silos and the process described above is used to properly condition the ash before it is transported for proper disposal within the lined landfill.

7.3 CCR Loading and Unloading

The loading and unloading process of CCR takes place in an enclosed building to minimize the generation of fugitive dust. In addition to this, there is a dedicated dust collector on each of the silos that collect a large majority of any dust created during the loading or unloading process. Watering of the loading and unloading building wets the area and prevents the dispersement of any fugitive dust that has escaped the building or haul trucks.

7.4 CCR Compaction

From the loading and unloading area, the CCR is immediately transferred to the landfill. The dumping of the CCR creates virtually no dust as it is conditioned with water. After placement in the active cell, a smooth-drum roller slowly compacts the CCR to an in-place dry density of approximately 70 pounds/cubic foot. Water is added as necessary during this process to facilitate compaction and limit dust generation. Additionally, special attention is given to the compaction of the temporary roads and slopes of the landfill used by the transportation trucks to minimize dust generation and erosion.

In the colder months, the exothermic reaction of CCR and water will aid in the placement and compaction of CCR. Placement is always in thin layers of approximately six inches to allow for rapid compaction of the material.

7.5 Intermittent Cover

There is no requirement for intermittent cover of the landfill due to the cementitious nature of the material, along with daily placement of CCR over previously-placed CCR. The daily placement and compaction satisfies the requirement for any intermittent cover.

7.6 Intermediate Cover

Again, due to the cementitious nature of CCR, areas of the landfill that are left undisturbed naturally develop a crust that is highly resistant to wind erosion and dust emissions. Once formed, Sherco staff will monitor the areas to ensure that the cementitious crust remains undisturbed and is functioning properly. If disturbed, the area will be watered to prevent dust emissions until a crust can reform. If the cementitious crusts do not perform as desired, Sherco has the option to use a soil stabilizer on areas where CCR has not been placed in 120 days. This material was applied during an extended Unit 3 outage and performed as indicated. No wind erosion or dusting occurred in the landfill during times that this product was applied. In the event that the landfill remains inactive for an extended period of time a chemical dust suppression chemical approved by the Minnesota Pollution Control Agency is utilized.

7.7 Erosion Control

Erosion may result in the breakup of material containing CCR and can cause it to become airborne. This erosion shall be minimized during active cell operations by maintaining surface and side slopes and collecting and routing of storm water into lined drainage ditches and the retention basin. Upon closure of fill areas, the top and side slopes of the landfill are to be graded, sloped to drain, covered and vegetated to provide long-term erosion control. Additionally, routine maintenance is conducted and repair of all drainage structures is completed as needed.

7.8 Landfill Capping

As the active landfill cells are filled to grade a final engineered cap system is installed. This cap system is comprised of a HDPE liner, followed by approximately one foot of drainage sand and one foot of top soil. Grass is then planted over the capped area. By capping these areas, risk of fugitive dust generation is nearly eliminated.

8 CCR Inspection

In order to assure that all measures outlined in this Plan are in place, being followed and working effectively, they will be assessed in the weekly inspection that is required on all affected CCR facilities. If all procedures are being conducted as outlined in this Plan, this will be noted accordingly on the inspection form. If there is anything to repair or processes to improve upon, this will be noted on the inspection form as well and a timeline for improvements or equipment replacement will be outlined.

9 Fugitive Dust Compliant Log

Any citizen complaints of fugitive dust appearing to originate from the plant will be investigated immediately. An electronic log will be kept to record all of these occurrences. If the fugitive dust is found to have originated from the facility, follow-up and corrective actions will be taken as needed. The template for this log is included as an attachment to this Plan.

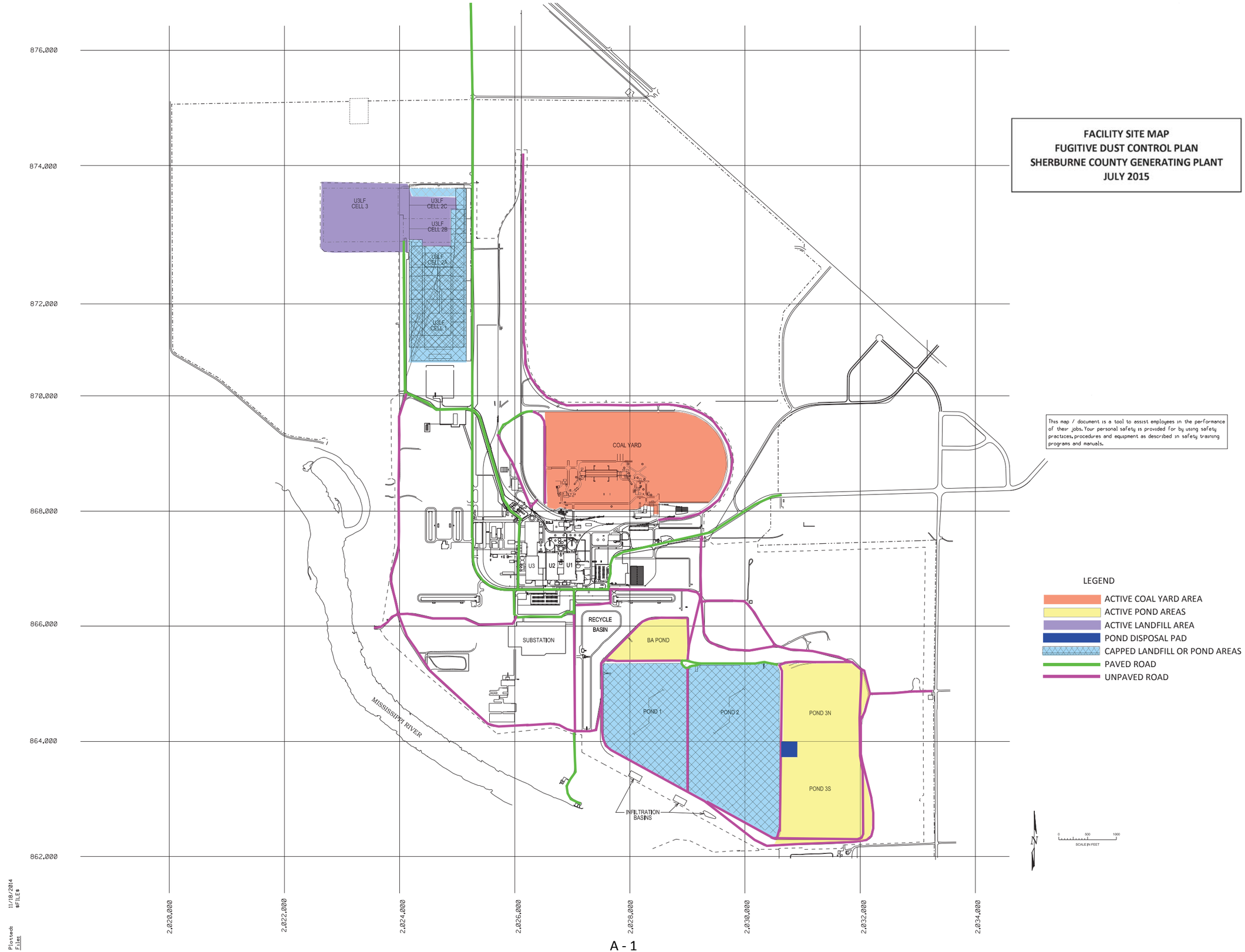
10 Plan Updates

This Fugitive Dust Control Plan will be assessed annually. As part of the assessment, all processes and procedures will be reviewed for their effectiveness and efficiency at minimizing or eliminating the generation of fugitive dust. If any new measures have been put into place at Sherco, these will be added into the plan. Lastly, the facility map will be updated with any changes to capped pond or landfill areas and plant roads.

Appendix A

Facility Site Map

FACILITY SITE MAP
FUGITIVE DUST CONTROL PLAN
SHERBURNE COUNTY GENERATING PLANT
JULY 2015



This map / document is a tool to assist employees in the performance of their jobs. Your personal safety is provided for by using safety practices, procedures and equipment as described in safety training programs and manuals.

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Appendix B

Fugitive Dust Complaint Log Template

Fugitive Dust Complaint Log

Reported		Alleged Event Information				Incident Evaluation		
Date	Time	Date	Time	Location	Description	Type	Response	Follow Up

Appendix C

Watering Logs and Meteorological Data

COAL YARD WAGON FILL STATION DATA								
Date and Time	Fill Complete?	Operator #	Fill Station	Destination	Vehicle ID	Vehicle Total (GAL)	Daily Total (GALS)	Annual Total (KGAL)

	SHERCO DAILY WEATHER REPORT								
Date and Time	Wind Direction	Hourly Rain (Inches)	Daily Rain (Inches)	Monthly Rain (Inches)	Barometric Pressure (Inches Hg)	Wind Speed (MPH)	Dewpoint (Degrees F)	Ambient Air Temp (Degrees F)	Wind Chill (Degrees F)