Fugitive Dust Control Plan

Sherburne County Generating Plant

Date: September 2015
Revision: 0

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Revision Log

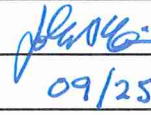
Revision No.	Revision Date	Revised Sections	Notes
0	September 1, 2015	NA	Original Publication

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 generation. The Sherco staff is actively engaged in dust control on a continuous basis. The Plan is a formal statement of the activities and methods employed 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 effective in the prevention or control of airborne fugitive dust. Each measure has been planned and executed based on site-specific operating conditions in order to produce the maximum benefit. These measures are outlined in the sections below. Watering is the primary activity 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 as 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 these areas of the facility.

2.2 Watering Equipment

Sherco owns three 10,000 gallon water wagons equipped with side 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 shown on 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 such that it is typically not subject to significant wind erosion.

2.3.3 CCR Storage Ponds

The active 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 subgrade 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 pneumatically 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. On dry and windy days, when wind erosion is observed without activity in the 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. Inactive areas, such as the landfill on weekends when ash hauling does not occur, 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 are 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 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 schedule (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 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 portion 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 limit the size of the area being worked.

2.7 Record Keeping

Sherco tracks 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 Dispensed
- Operator's Employee ID Number
- Total Daily Water Usage by Area

In addition, daily meteorological data is recorded for temperature, wind speed and precipitation. The watering records and the meteorological data are 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 shown on 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 the Recycle Basin north past the landfill to the plant exit. Lastly, one section of the pond area has been paved in order to minimize the creation of airborne dust due to higher volume of truck traffic 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 been tracked 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 approval for use of 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. Dust suppression chemicals are not utilized frequently, but the option is available to control fugitive dust when the need arises.

4 Fugitive Dust Control – Coal Yard

4.1 Overview

In addition to the main fugitive dust control procedure of watering 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 application to specific areas of the coal pile that are prone to generation of fugitive dust and to belts and feeders in order to minimize dust generation as 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 unloading process occurs inside a building. A dust suppressant is applied during the unloading process in order to minimize dust generation during the dumping of coal from the train cars. Additionally, a dust collector is used to capture dust that is 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 treated after unloading from rail cars and prior to stacking. Additionally, dust generation is reduced through various operating practices such as lowering the boom on the stacker-reclaimer to minimize the free fall height of the coal.

4.5 Dust Collection Systems

Dust collection systems are in place at almost all processes within the coal yard. These systems trap 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 dust generation. 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 shipment of waste to the ponds. However, there is some material that is transferred by truck to the ponds. An example of this is 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 minimized.

Every attempt is made to cover the material, wet the material, and drive slowly to minimize the potential for dust generation. When material is brought on-site from other Xcel Energy coal fired generating plants for disposal, Sherco staff is informed prior to the waste being placed in the ponds for disposal. This material is typically water-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 are disposed in the pond; this location is shown in the attached facility map. By placing the CCR in a centralized location, it minimizes the potential for fugitive dust to reach the facility boundary and drifting off-site. 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 dry and windy conditions.

5.4 Pond Capping

As the ponds reach full capacity, they are dewatered and an engineered cap is installed. During the dewatering process free liquids are transferred to the active pond. Conditioned CCR and soil are used to achieve final contours so that the final cap has a sufficient slope to promote positive drainage. The final cap is comprised of, from bottom to top, a screened buffer layer, a geomembrane liner, one foot of drainage sand and one foot of topsoil. 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 applied only to the roads in the bottom ash pond area), there are other handling processes in place that are used to minimize the generation 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. CCR is transferred from the bottom ash pond to the scrubber solids pond on an annual or bi-annual basis in order to maintain capacity in the bottom ash pond. This material is always transferred in a wet condition, resulting in minimal potential for fugitive dust generation. Haul roads used for transferring CCR 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 and drainage are maintained and dust generation is avoided. These procedures are described in the following sections.

7.2 CCR Conditioning

One of the most effective dust control measures for the CCR collected from Unit 3 in fabric filter bags is the addition of water to the CCR so that it has an adequate moisture content so as to not release fugitive dust from the haul trucks during transfer to and disposal in the landfill. Dry CCR is temporarily stored in two silos prior to 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 CCR 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 condition the ash before it is transported for landfill disposal.

7.3 CCR Loading and Unloading

Loading and unloading of dry CCR at the storage silos takes place in an enclosed building to prevent release of fugitive dust generated during the process. In addition, dust collectors located on each of the silos collect dust generated during the loading and unloading process. Watering of the area in and around the loading and unloading building is performed to further minimize generation of fugitive dust from the area.

7.4 CCR Compaction

From the loading and unloading area, the CCR is immediately transferred to the landfill. Dumping of CCR at the landfill creates virtually no dust due to moisture-conditioning of the CCR. After placement in the landfill, a smooth-drum roller compacts the CCR to an in-place dry density of approximately 70 pounds/cubic foot. Water is applied 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 aids in the placement and compaction of CCR. CCR is spread in lifts of approximately six inches to allow for consistent 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 a crust has formed, Sherco staff monitors the areas to ensure that the crust remains undisturbed and functions properly. If disturbed, the area will be watered to prevent dust emissions until a crust can reform. If the crust does 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 required. Minimal wind erosion or dusting occurred in the landfill during times that this product was applied.

7.7 Erosion Control

Erosion from storm water runoff may disrupt the crust that forms on the CCR and result in increased potential for fugitive dust. Storm water runoff controls are maintained during operations, including maintaining slopes and collecting and routing storm water runoff to lined drainage ditches and the retention basin. Prior to capping of fill areas, the top and side slopes of the landfill are graded, sloped to drain, and may be temporarily vegetated to provide long-term erosion control. Additionally, routine maintenance and repair is performed for all drainage control structures.

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, from bottom to top, a geomembrane liner, 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 the fugitive dust control measures outlined in this Plan are implemented and effective, 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 repairs are required or process improvements can be made, this will be noted on the inspection form and a timeline for repairs and improvements will be outlined.

9 Fugitive Dust Complaint Log

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

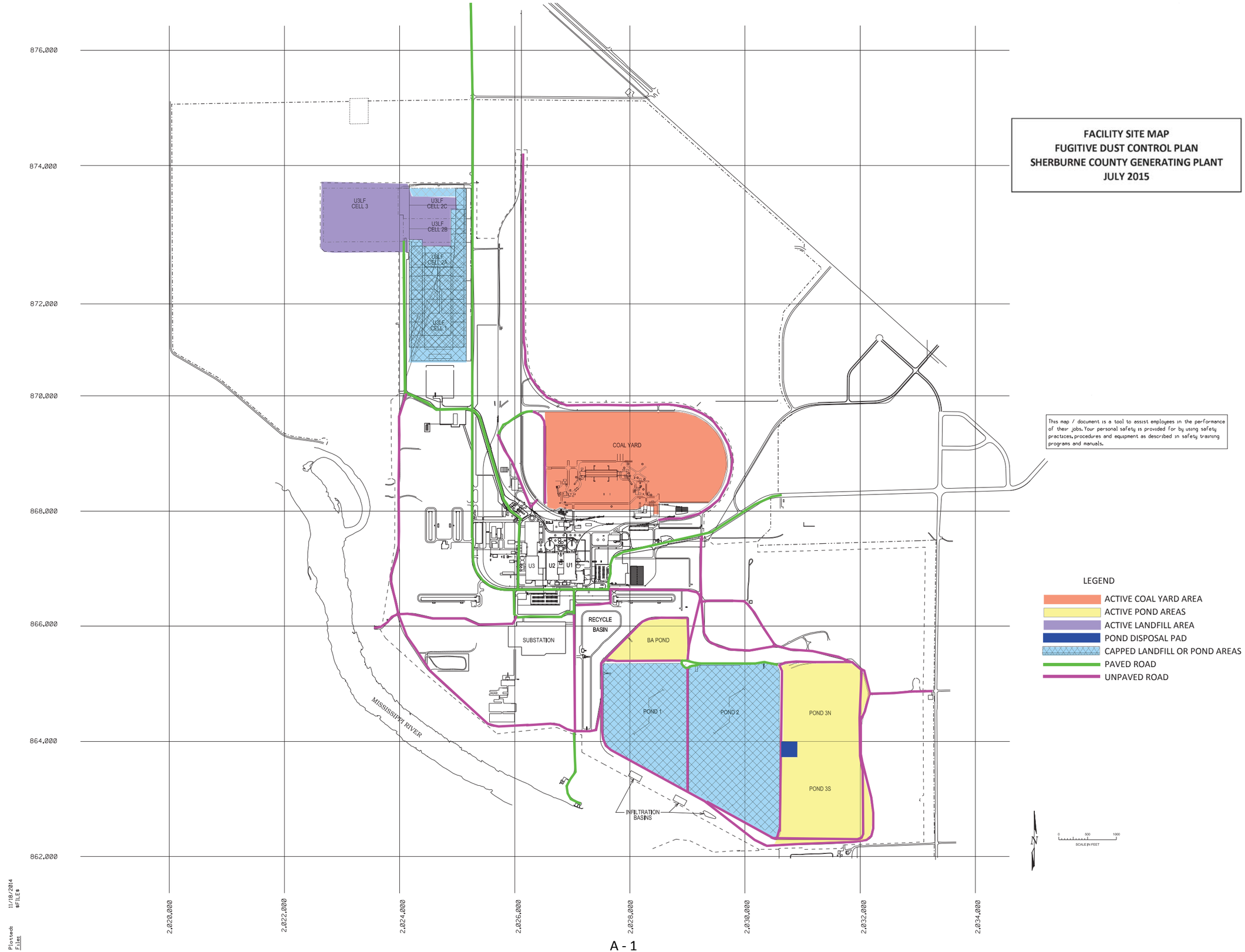
10 Plan Updates

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 implemented during the year, these will be incorporated 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.

Plotted: 11/18/2014
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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)