Fugitive and Coke Handling Dust Control Guide

Malfunction Abatement Plan (MAP)

Marathon Petroleum Company LP
Michigan Refining Division

08/23/2018

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1.0 Purpose

The document serves as the facility wide fugitive dust control guide for Marathon Petroleum Company's Detroit Refinery (MRD). It outlines the measures taken to control the release of fugitive dust from refinery operations, construction activities, and coke handling. Also included are contingency measures to be implemented during a malfunction of the coke handling or air pollution control systems (Malfunction Abatement Plan (MAP)). Lastly, the Enhanced Street Sweeping Program for local public roadways is included in this procedure.

2.0 Scope

Electronic versions of MPC Procedures/Guides can be found on the MRD homepage under the "Forms/Procedures" section.

- This procedure is designed to apply to all areas of the refinery including operating areas, construction areas and roadways immediately affected by the refinery activities.
- This procedure is based on Best Management Practices (BMP's) and the appropriate fugitive dust controls determined according to the situation.
- This procedure applies during the months of the year where dust is prevalent. Portions of this procedure may be suspended during heavy rain events or after snow accumulation begins for the winter until the roads are clear and dry in the spring. The Coke Handling System Requirements apply throughout the year.

3.0 Limits

No visible emissions from coke truck loading, weigh bins, and the coke handling system beginning with the enclosed conveyor leading to the crusher.

4.0 Summary

Dust control at MRD has three parts: General Fugitive Dust Control Program (Section 5), Enhanced Street Sweeping Program (Section 6), and Coke Handling System Dust Control & MAP (Section 7).

5.0 General Fugitive Dust Control Program

5.1 Description: During normal operating conditions dust control measures must be taken for paved and unpaved lots and surfaces in the facility. In addition, special projects including construction, demolition or excavation must consider other potential dust control options as necessary to control fugitive dust.

5.2 Requirements-Normal Operations: The following fugitive dust control measures are applicable at MRD during normal operations.

5.2.1 All vehicles must follow posted speed limits to help minimize the generation of dust in the refinery.

5.2.2 The refinery LDAR/BWON Technicians will perform visual inspections and evaluate fugitive dust emissions within the refinery on a monthly basis and notify Environmental of any issues. Inspections will be documented on REW-AG-048-Form01- DT Refinery Dust Control Inspection Recordkeeping Sheet.

5.2.3 A street sweeper or water truck will be operated as needed. Refinery road sweeping will be documented using the Refinery Dust Control/Street Sweeping Recordkeeping Sheet REW-AG-048-FORM02-DT).

5.2.4 Vehicles transporting materials capable of generating dust shall be suitably covered on each trip to prevent release of materials and particulate matter. The covering material shall be maintained in good condition.

5.2.5 When increased traffic or activities create dust that cannot be adequately controlled by watering then application of an approved dust suppressant is

required (Maintenance Department will maintain records using the Refinery Dust Control/Street Sweeping Recordkeeping Sheet REW-AG-048-FORM02-DT).

5.2.6 Material collected from dust sweeping activities will be offloaded after each use into roll-off boxes for containment and disposal.

5.3 Requirements-Special Projects: During special projects such as site-clearing, grading, trenching, mass excavation, construction, reconstruction, demolition or when other high-dust activities are taking place within the refinery, one or more of the following additional measures will be utilized.

5.3.1 Project Coordinator for special projects is responsible for implementing all required dust control activities during site-clearing, grading, trenching, mass excavation, construction, reconstruction, and demolition projects. Records of such activities must be provided to the Environmental Department.

5.3.2 Pavement will be considered for long-term parking & warehouse / lay-down areas to provide good parking, safe material storage, and eliminate the generation of particulate matter and dust.

5.3.3 Measures will be taken to prevent fugitive dust emissions from inactive storage piles (excavated earth and debris). Typical methods for controlling fugitive dust emissions from inactive storage piles may include protecting the inactive pile with a suitable cover (tarp), enclosing the pile, spraying the pile with water to maintain moisture or treating the pile with approved surfactant solution or equivalent method.

5.3.4 Due to the potential for large amounts of particulate matter with construction activities, sewer drains within the refinery will be covered with either burlap or cheese cloth to protect them from getting plugged. These covers must be visually inspected and cleaned or replaced as needed.

5.3.5 At the end of a construction operation and prior to commissioning the area for routine activity, the sewers & catch basins must be inspected and/or cleaned.

5.3.6 Methods to prevent “Track Out” for special projects will be evaluated. “Track Out” applies to projects throughout the year, even during the winter months. “Track Out” control may include: installing a gravel apron at exit location(s) to assist in dislodging and minimize track out before exiting onto paved roads and surfaces; installing a wash station for cleaning trucks, equipment wheels/tracks, and undercarriages on site to prevent tracking mud out before exiting onto paved roads and surfaces; and/or installation of rumble strips (Tire Knockers) at exit location(s) to loosen/dislodge mud from the tires of trucks and equipment before leaving the site.

5.4 Recordkeeping: The refinery LDAR/BWON Technicians will document the visual inspections on REW-AG-048-FORM01-DT. As needed, REW-AG-048-FORM02-DT will be completed by Maintenance Department as described in 5.2.5. Records will be kept on file for a period of 5 years and made available to the Michigan Department of Environmental Quality, Air Quality Division upon request.

5.4.1 Records are located at N:\Environmental\Air - NEW!\Dust Control Plans_REF0606\Records from EMSI - Facility Roads

5.4.2 Contact:
MRD Environmental Department Supervisor
Phone: 313.297.6000

Note: Attachment A includes color coded maps showing the areas where dust is generated, the type of controls needed (water vs. sweeper), and the most efficient routing for each area. Cleaning of Restricted Access Roads requires permission from the appropriate Owning Department, as well as an Unattended Hot-Work Permit and a gas check in accordance with SAF-062. A spotter shall be used when water trucks or street sweepers are operated in restricted road areas.

6.0 Enhanced Street Sweeping Program

6.1 Description: During development of the Detroit Heavy Oil Upgrade Project (DHOUP), Marathon voluntarily agreed to implement measures to reduce emissions of particulate matter (PM) and particulate matter with a diameter less than 10 microns (PM10) in the vicinity of the Detroit Refinery. These measures include implementing an Enhanced Street Sweeping Program on public roads near the refinery as indicated in Attachment A Enhanced Street Sweeping Program Route.

6.2 Requirements: Street sweeping will be conducted using a sweeper that achieves a high level of control. Street sweeping will include portions of Oakwood Boulevard, Dix Road, Sanders Street, Schaefer Avenue, and Fort Street as illustrated in Attachment A Enhanced Street Sweeping Program Route. Sweeping of each road segment, in both directions, will occur April through September at a frequency of twice per calendar month. Sweeping will not be conducted on days with measurable precipitation.

6.3 Recordkeeping: A record of enhanced street sweeping activities will be kept on file for a period of 5 years and made available to the Michigan Department of Environmental Quality, Air Quality Division upon request. The records will indicate the date, time, weather conditions, and road segments swept during each month (REW-AG-048-FORM04-DT). Inspections for each of the trucks or sweepers used within the refinery and enhanced street sweeping program are conducted to ensure each truck is maintained. Records are completed by contractors coordinated by Maintenance.

6.3.1 Records are located at N:\Environmental\Air - NEW!\Dust Control Plans_REF0606\Records from Maintenance - Enhanced Street Sweeping

6.3.2 Contact:
MRD Environmental Department Supervisor
Phone: 313.297.6000

Emission Reductions: The street sweeping program is expected to reduce emissions of PM and PM10 by 69.5 tons per year and 13.8 tons per year, respectively, as detailed in the Offset Calculation tables included as Attachment B.

7.0 Coke Handling System Dust Control & MAP

7.1 Description: Components of the coke handling system are shown in the Coke Handling System Material Flow Diagram (REW-AG-048-FORM05-DT). Coke is cut from the coke drum using a high pressure water cutter. Coke exits the bottom of the coke drum, dropping onto the coke chute and then into the water-filled coke pit. Coke remains in the pit until it has cooled and becomes saturated with water. A bridge crane removes coke from the pit and stages it on the pad for dewatering. The bridge crane loads dewatered coke onto the grizzly screen at the coke feed conveyor hopper. The coke feed hopper discharges coke to the belt feeder conveyor in the feed conveyor transfer building. Coke passes through a magnetic separator and transfer chute, then leaves the transfer building on the coke crusher feed conveyor. The coke crusher feed conveyor discharges coke to the crusher feed chute and into the crusher. Crushed coke is discharged to the plant transfer conveyor and coke sampling system. The plant transfer conveyor discharges to the surge bin feed chute in the truck load out building. Coke from the surge and weigh bins is loaded onto trucks in the truck load out building. The process has numerous dust controls required to be operational.

7.2 Requirements: Savage Services Corporation (Savage) is responsible for operation and maintenance of the coke handling system and associated air pollution control equipment. Coke handling and loading operations are conducted under the control of Savage operators using

direct visual observations, instrumentation and/or surveillance camera systems. The coke handling system is controlled, monitored and supported from the control room in the truck load out building. Savage has developed guidelines for proper operation of the coke transfer and dust control equipment. These guidelines address normal operating conditions, equipment troubleshooting during abnormal conditions, and shutdown procedures. This includes identification of the operating variables monitored to detect a malfunction or failure, the normal operating range for these variables, a description of the method of monitoring, actions to be taken if a component is outside the normal operating range, and recordkeeping requirements.

- The primary method of dust control is to maintain an adequate moisture level in the coke. This is accomplished by controlling the amount of time coke is allowed to be staged on the pad and ensuring that water spray and fogging systems are operating when needed.
- Coke is sampled three times per week and analyzed for moisture content. Moisture of coke on the pad can be increased by using the wall-mounted sprinkler system.

7.3 Recordkeeping: Savage completes a Coke Handling System Emissions Checklist once per day.

7.3.1 Records are located at N:\Environmental\Air - NEW!\Dust Control Plans_REF0606\Records from Savage - Coker Dust Control

7.3.2 Contact:
MRD Environmental Department Supervisor
Phone: 313-297-6000

7.4 Maintenance: Savage has developed a comprehensive preventive maintenance program (Malfunction Abatement Plan) for the coke handling system and associated air pollution control equipment. The program includes identification of the supervisory personnel responsible for overseeing the inspection, maintenance and repair of coke handling equipment and air pollution controls, descriptions of the items or conditions to be inspected, frequency of inspections or repairs, identification of the major replacement parts that will be maintained in inventory for quick replacement. The preventive maintenance program is described in procedures available upon request from Savage.

7.5 Malfunction Abatement Plan (MAP): The coke conveyor and truck loading systems have been sized to process the daily coke production in an 8 hour period. In addition, the coke pad has been sized to hold 3 days of coke production. This allows ample time to complete minor repairs and preventative maintenance activities. Savage has also developed a contingency plan to minimize the impact to the environment during malfunctions of the major components of the coke handling or air pollution control systems. Contingency measures include the following:

7.5.1 Water curtain, water spray or fogging systems: Use fire hose, fire monitors or other temporary spray systems.

7.5.2 Bridge crane: Use mobile equipment (excavators, front-end loaders, etc.) to move coke from the coke pit to the pad and from the pad to the conveyor feed hopper. Use fire hose, fire monitors or other temporary spray systems to provide dust control as needed.

7.5.3 Conveyors: Use mobile equipment (excavators, front-end loaders, etc.) or temporary conveyor systems to move coke from the coke pad onto trucks. Use fire hose, fire monitors or other temporary spray systems to provide dust control as needed.

7.5.4 Crusher: Use mobile equipment (excavators, front-end loaders, etc.) or temporary conveyor systems to move coke from the coke pad onto trucks without crushing, or use mobile crusher. Use fire hose, fire monitors or other temporary spray systems to provide dust control as needed.

7.5.5 Dust collection and baghouse systems: Increase moisture content of coke and use fire hose, fire monitors or other temporary spray systems to provide dust control as needed.

7.6 Equipment and Dust Controls: The equipment and the dust control measures for normal operations are in the chart below.

Equipment	Dust Control Method
Coke chute	Equipped with a water curtain operated at all times when coke is being removed from the drum.
Coke pit	The water level in the coke pit is maintained to cool and wet the coke.
Coke pad	Surrounded by a 30-foot wall. Coke piles on the pad are not allowed to exceed the height of the perimeter wall. Water sprinklers are mounted to the wall and can be used to increase the moisture content of the coke if necessary.
Bridge Crane	Drop height is limited to reduce dust creation.
Grizzly	The feed hopper can be manually sprayed with water to control dust if necessary.
Feed Conveyor Transfer Building	Conveyors entering and leaving the feed conveyor transfer building are totally enclosed. The building has a dust collection system (baghouse) with a collection hood at the magnetic separator feed and discharge chutes.
Crusher Building	Conveyors entering and leaving the crusher building are totally enclosed. The crusher building has a dust collection system (baghouse) with collection hoods at the crusher feed and discharge chutes.
Truck Load Out Building	The conveyor entering the truck load out building is totally enclosed. The load out building has a dust collection system (baghouse) with collection hoods at the surge bin feed chute and truck load out area. Coke is loaded onto trucks through a telescoping load out chute. The load out chute is equipped with a fogging system that can be activated to control dust if necessary. Loaded trucks pass through a wheel wash station which can be activated if necessary to control track out as they leave the building.
Trucks	Loaded trucks are tarped to prevent material loss while in transit.
Roads	In-plant roads leading to and from the coke transfer building are constructed of concrete. These roads are visually inspected at least once per week. Sweeping is conducted as necessary to prevent dust from accumulating and to avoid track out.

8.0 Roles and Responsibilities

- The Marathon Operations Supervisor is responsible for ensuring that Savage completes their work in a responsible manner and coordinating support when needed.
- The Marathon Maintenance Coordinator is responsible for warehousing spare parts and coordinating support when needed.
- The Maintenance Department is responsible to evaluate the volume of dust being generated in the refinery and coordinate the appropriate controls.
- The Contractor Coordinators are responsible for ensuring their contractor(s) work in a responsible manner and implement BMP's to control fugitive dust emissions for construction, excavation and demolition projects at the Detroit Refinery.
- The Fugitive Dust Control Coordinator shall review the records generated from this program on a quarterly basis.

9.0 Definitions

Fugitive Dust – Particulate matter that originates from indoor or outdoor industrial operations and is emitted to the air through building openings and general exhaust ventilation. Fugitive dust also includes emissions from storage piles, material handling operations and roadways due to disturbances by wind or vehicle traffic.

10.0 References

- Renewable Operating Permit (ROP) MI-ROP-A9831-2012c issued on September 12, 2016.
- REW-AG-048-FORM01-DT Refinery Dust Control Inspection Recordkeeping Sheet
- REW-AG-048-FORM02-DT Refinery Dust Control/Street Sweeping Recordkeeping Sheet

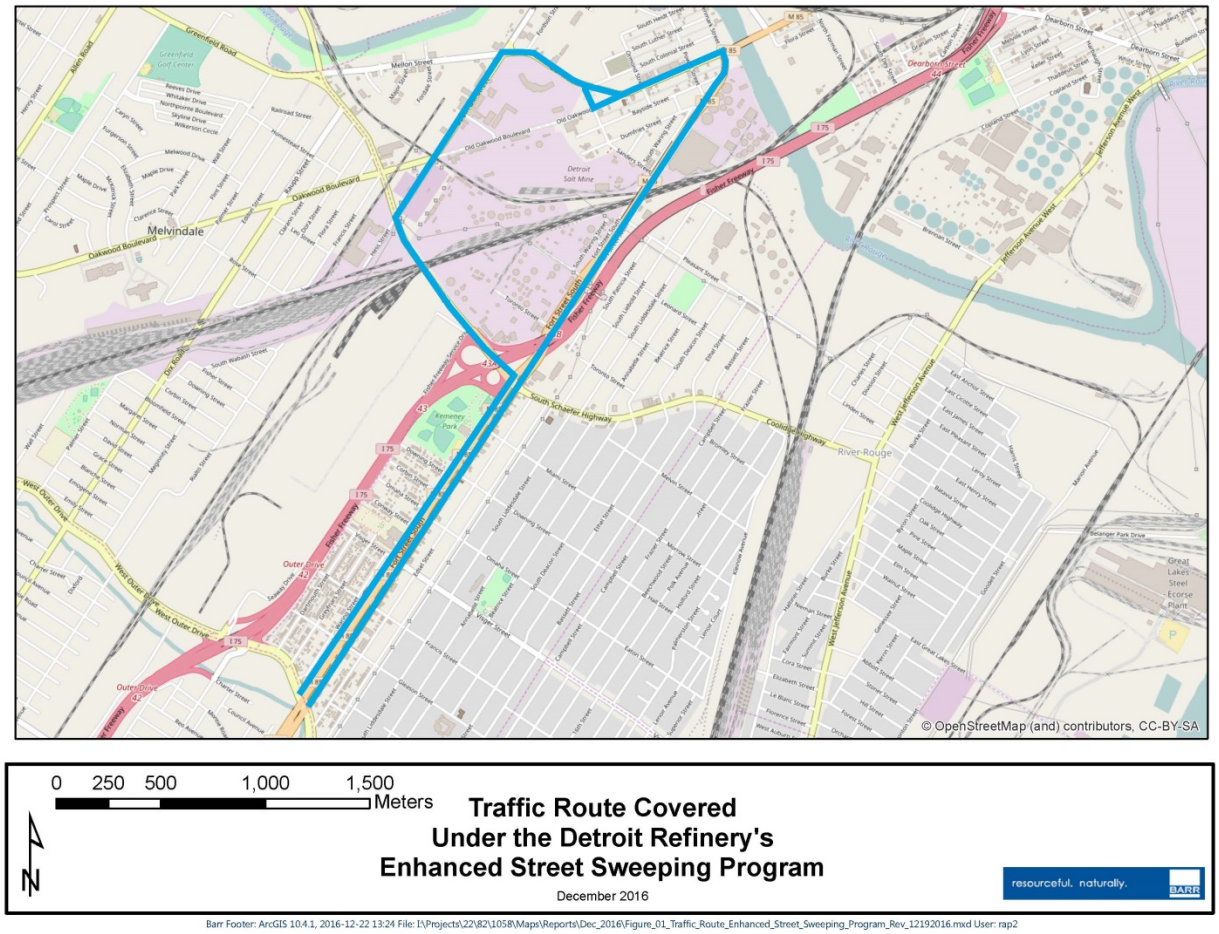
- REW-AG-048-FORM04-DT Enhanced Street Sweeping Recordkeeping Sheet
- REW-AG-048-FORM05-DT Coker Unit-70 Coke Handling System Material Flow Diagram

11.0 Revision History

Revision number	Description of change	Written by	Approved by	Effective date
3	Changed PMIC to CMMS maintenance systems	TLD	IWL	10/29/2013
4	Wording changes and added requirement for Fugitive Dust Coordinator to review records on a quarterly basis	TLP	IWL	02/13/2015
5	Format change and simplified document	TLP	IWL	8/31/2015
6	Updated site plans with new streets. Various functional and administrative changes.	KRL	GB	12/26/2016
7	Added hyperlinks, updated recordkeeping sheet, removed Form 03 Paved Roads for Potential PM and PM10 Emissions Reductions. Updated FORM04	KRL	GB	1/24/2017
8	Updated site contacts, corrected Savage recordkeeping to once per day per ROP, corrected phone # and file paths	KRL	GB	8/23/2018

ATTACHMENT A
DUST CONTROL MAPS

ENHANCED STREET SWEEPING PROGRAM ROUTE



0 250 500 1,000 1,500 Meters

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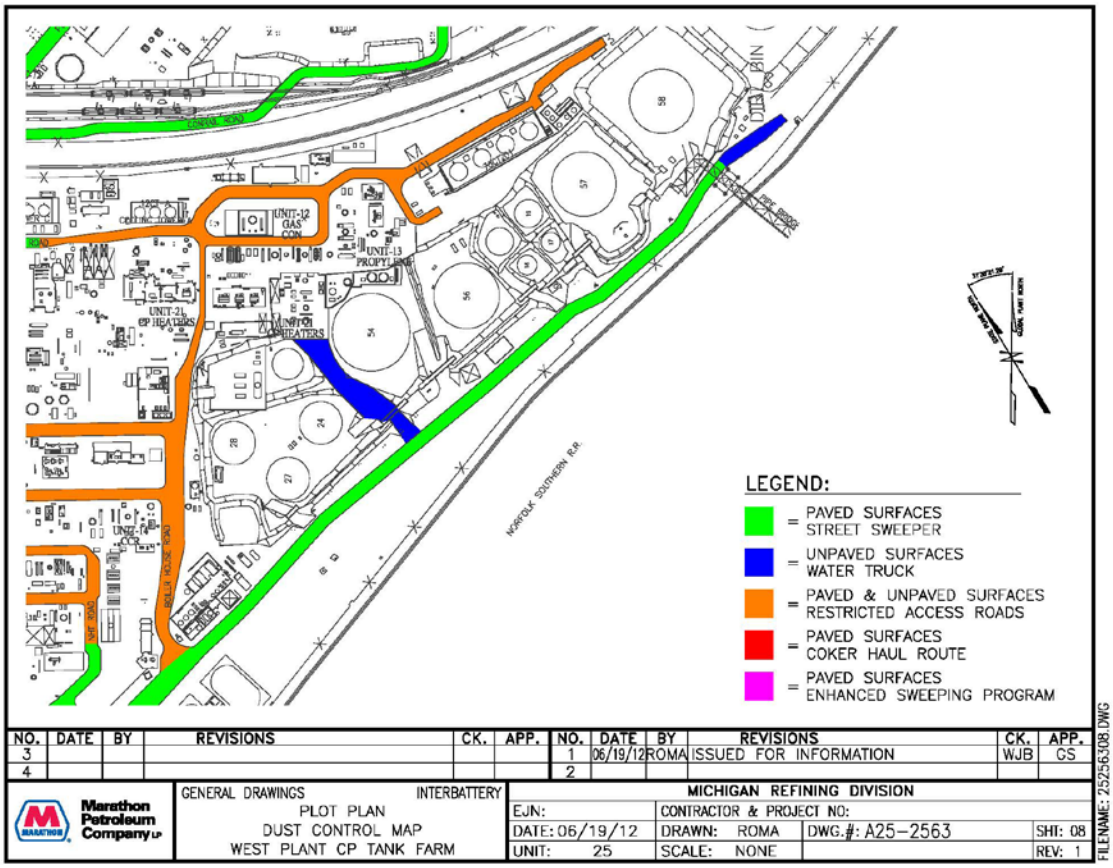
Traffic Route Covered Under the Detroit Refinery's Enhanced Street Sweeping Program

December 2016

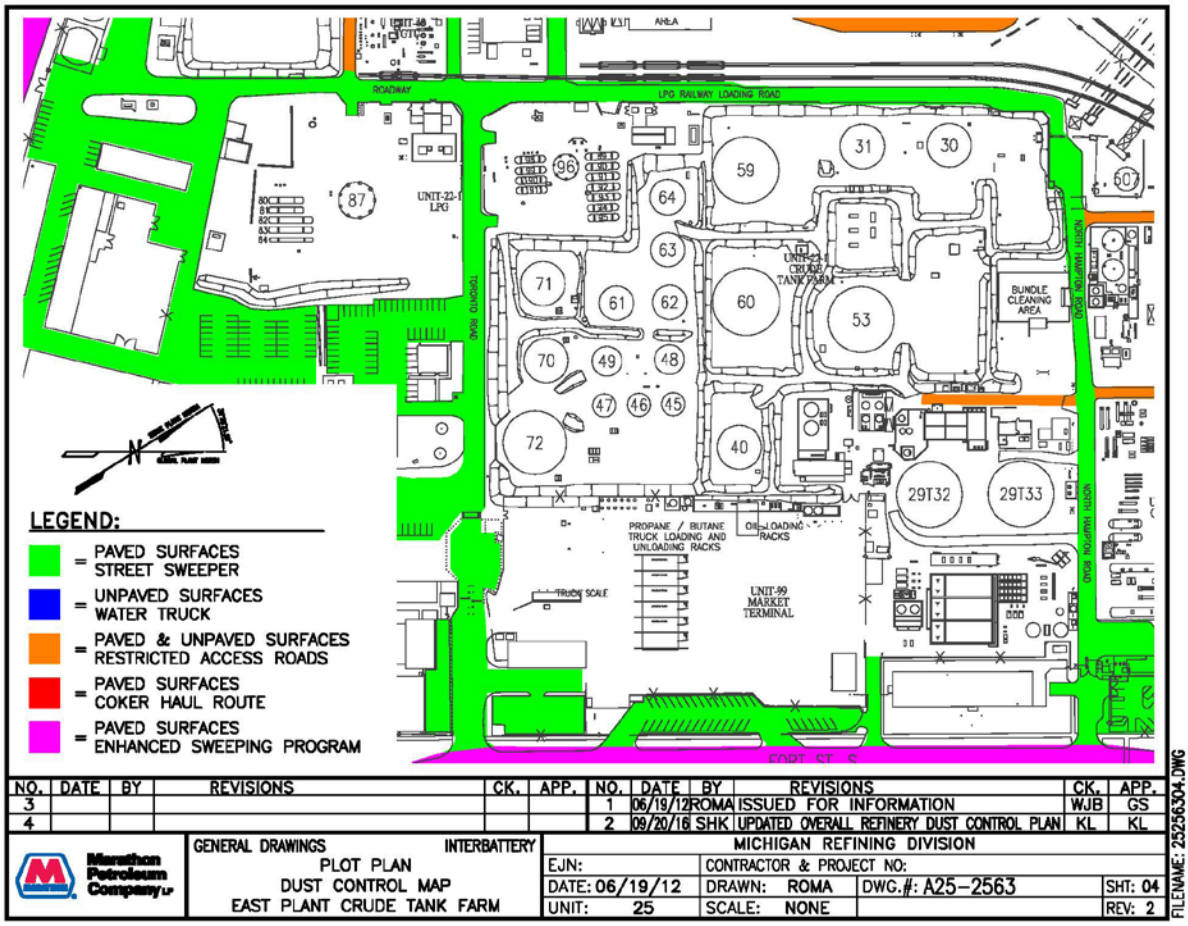
resourceful, naturally. BARR

Barr Footer: ArcGIS 10.4.1, 2016-12-22 13:24 File: I:\Projects\22\82\1058\Maps\Reports\Dec_2016\Figure_01_Traffic_Route_Enhanced_Street_Sweeping_Program_Rev_12192016.mxd User: rap2

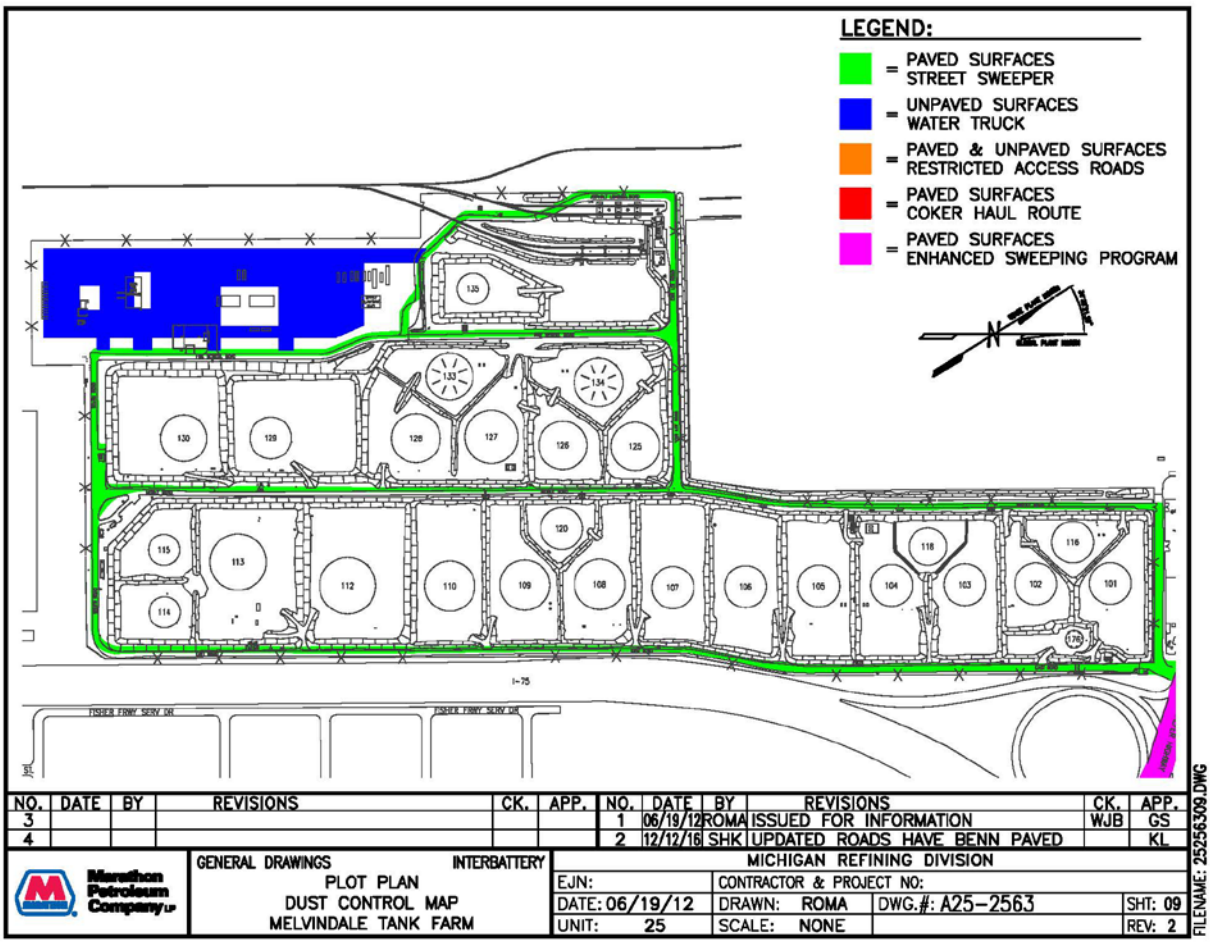
WEST PLANT CP TANK FARM



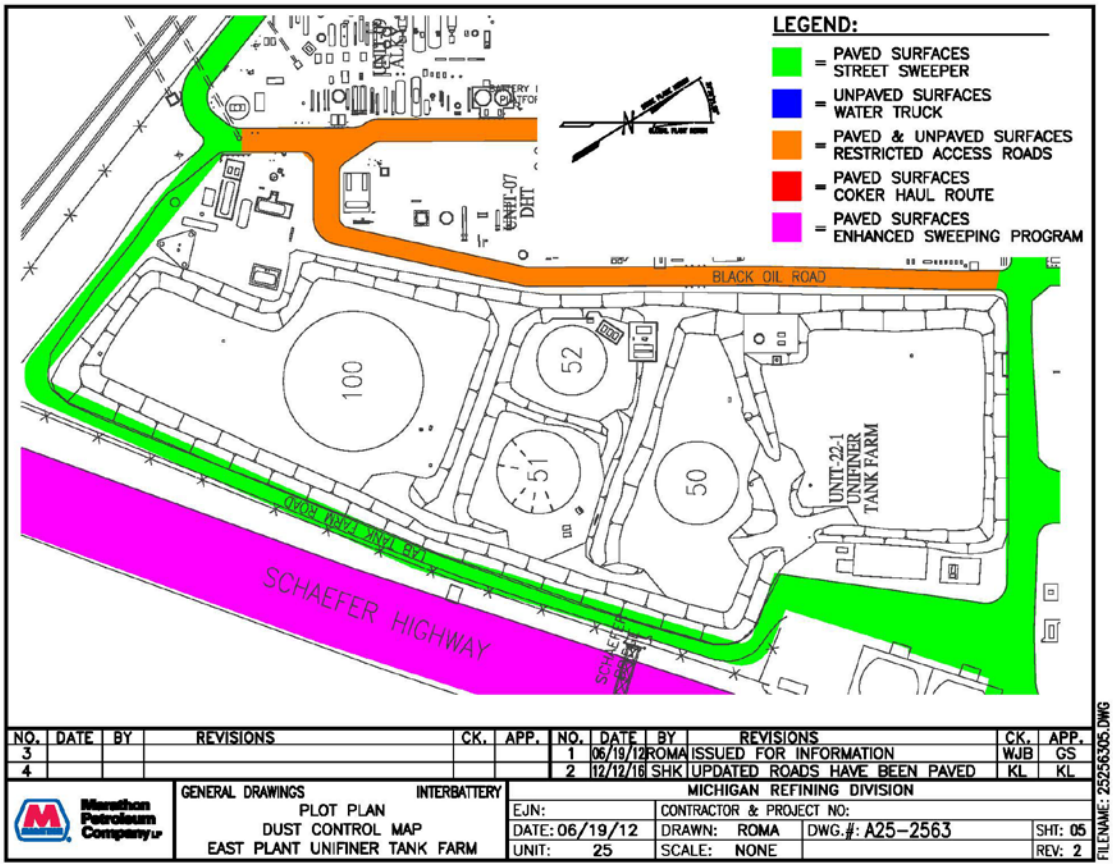
EAST PLANT CRUDE TANK FARM



MELVINDALE TANK FARM



EAST PLANT UNIFINER TANK FARM



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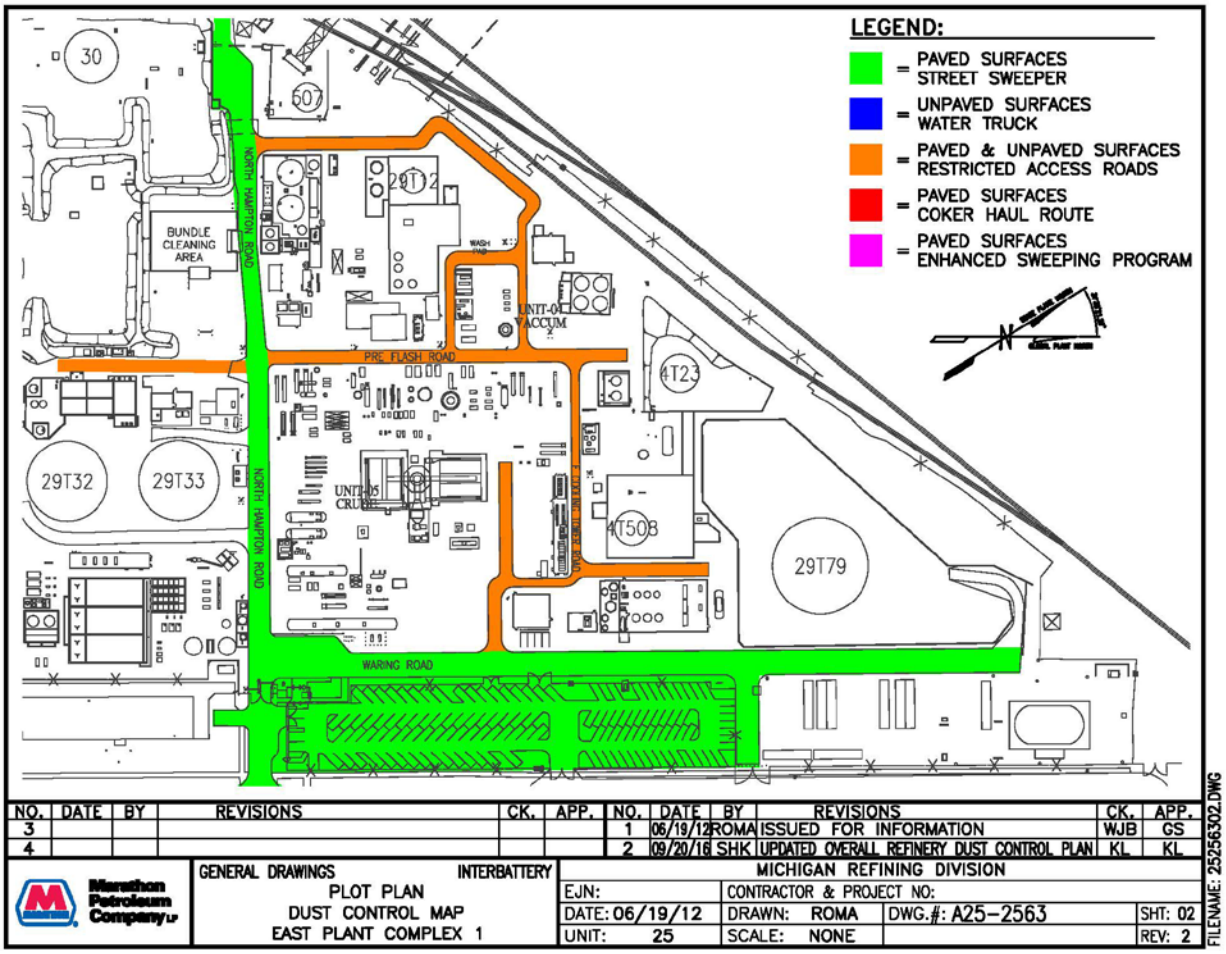

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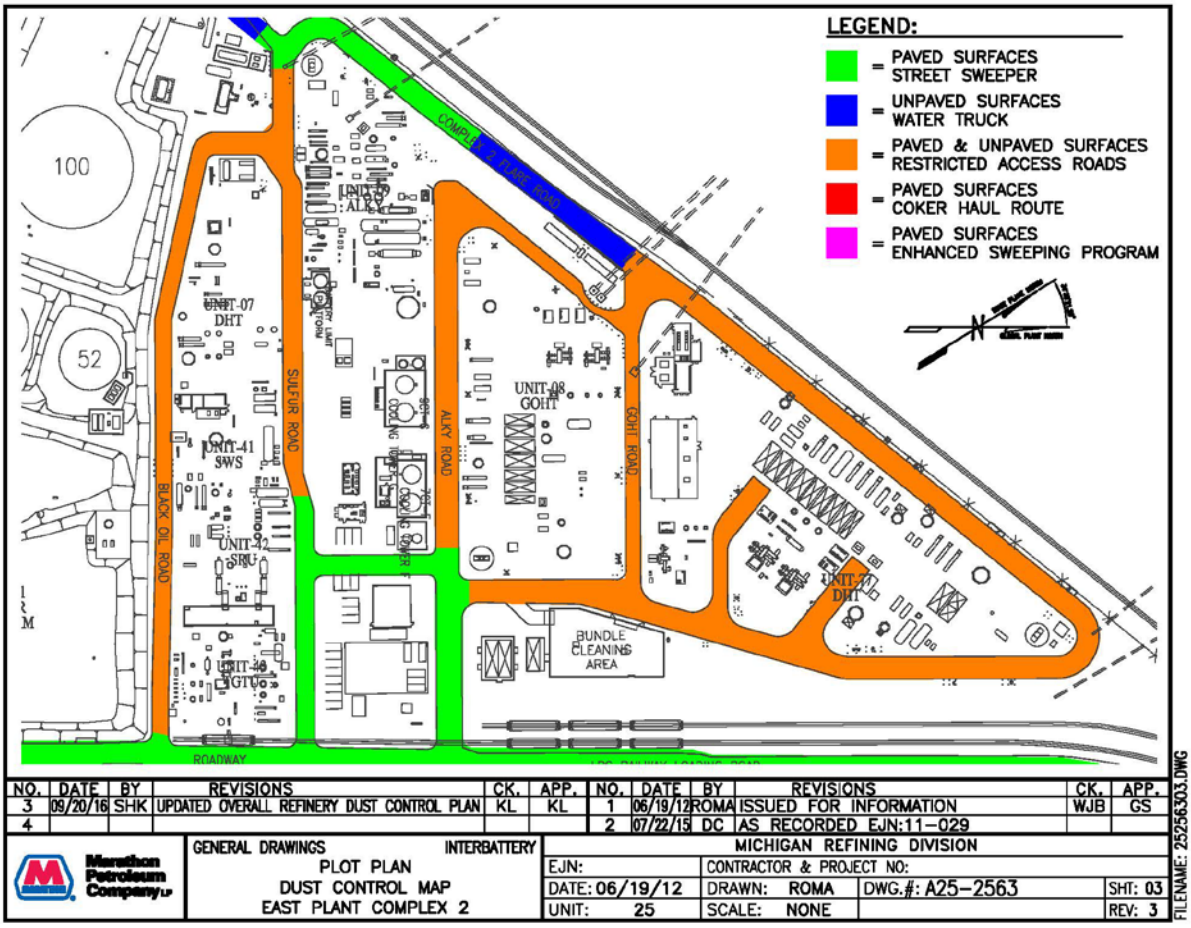

NO.	DATE	BY	REVISIONS	CK.	APP.	NO.	DATE	BY	REVISIONS	CK.	APP.
3	09/20/16	SHK	UPDATED OVERALL REFINERY DUST CONTROL PLAN	KL	KL	1	06/19/12	ROMA	ISSUED FOR INFORMATION	WJB	GS
4						2	07/22/15	DC	AS RECORDED EJN:11-029		

Marathon Petroleum Company LP

GENERAL DRAWINGS INTERBATTERY
PLOT PLAN
DUST CONTROL MAP
EAST PLANT COMPLEX 2

MICHIGAN REFINING DIVISION

EJN:	CONTRACTOR & PROJECT NO:		
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UNIT: 25	SCALE: NONE		REV: 3

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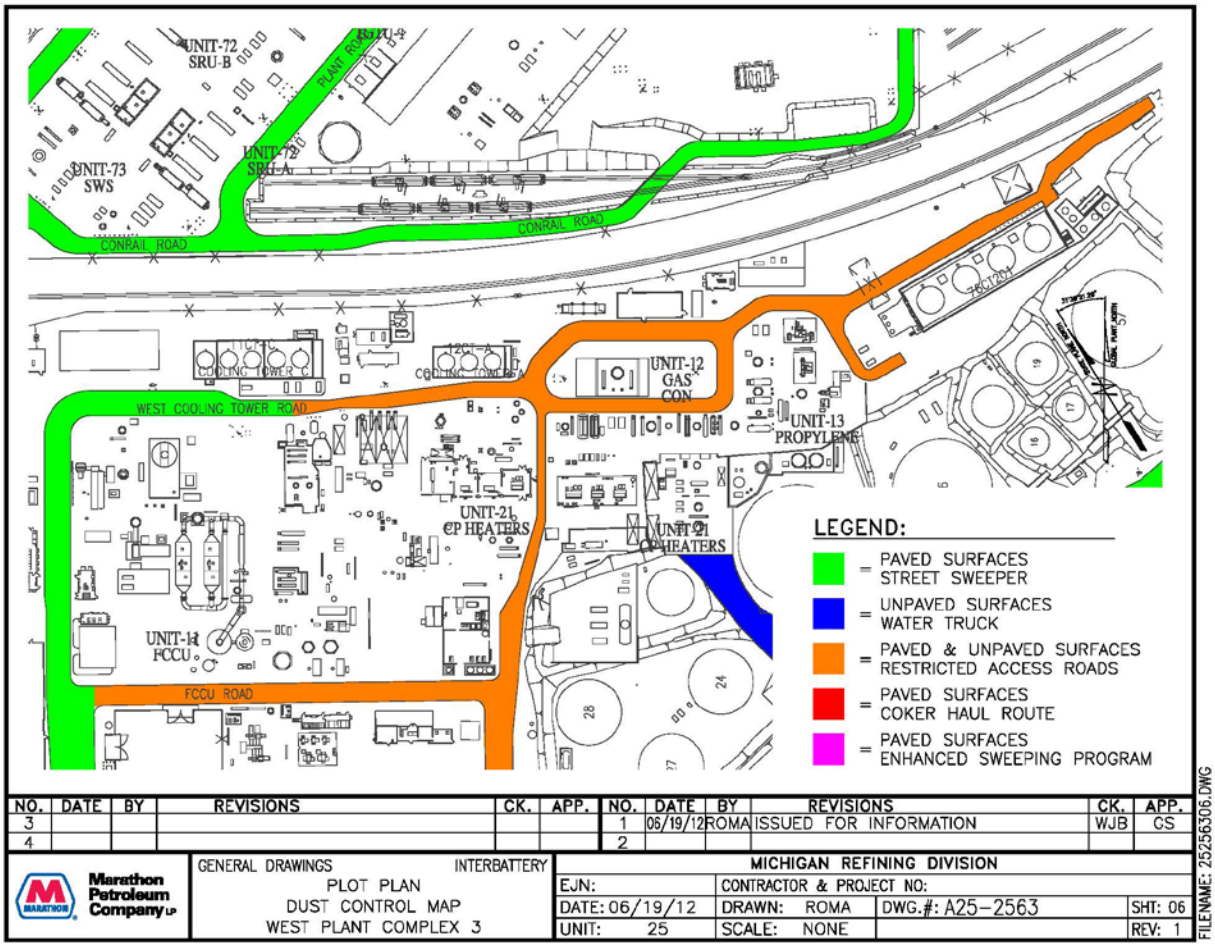
WEST PLANT COMPLEX 3



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3					
4					

NO.	DATE	BY	REVISIONS	CK.	APP.
1	06/19/12	ROMA	ISSUED FOR INFORMATION	WJB	GS
2					

Marathon Petroleum Company LP

GENERAL DRAWINGS INTERBATTERY
PLOT PLAN
DUST CONTROL MAP
WEST PLANT COMPLEX 3

MICHIGAN REFINING DIVISION

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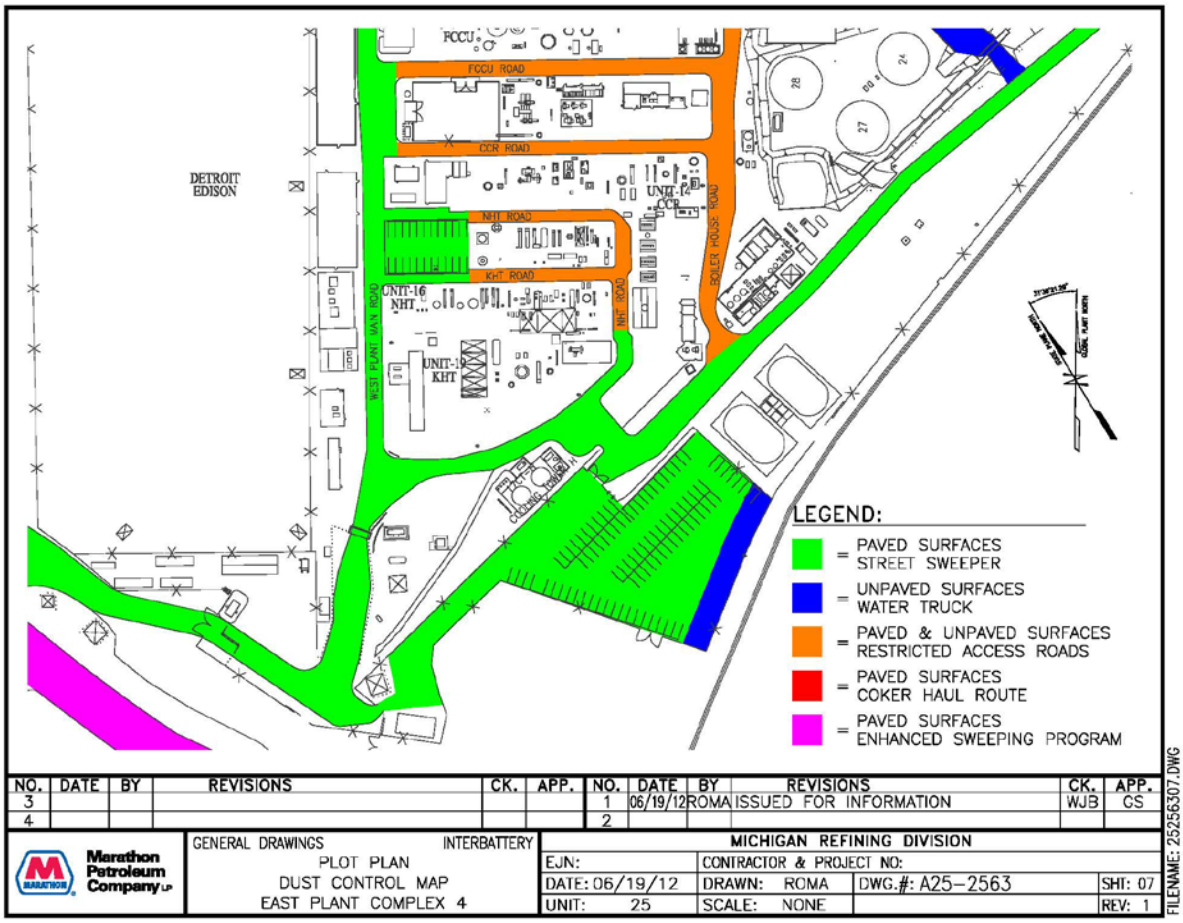

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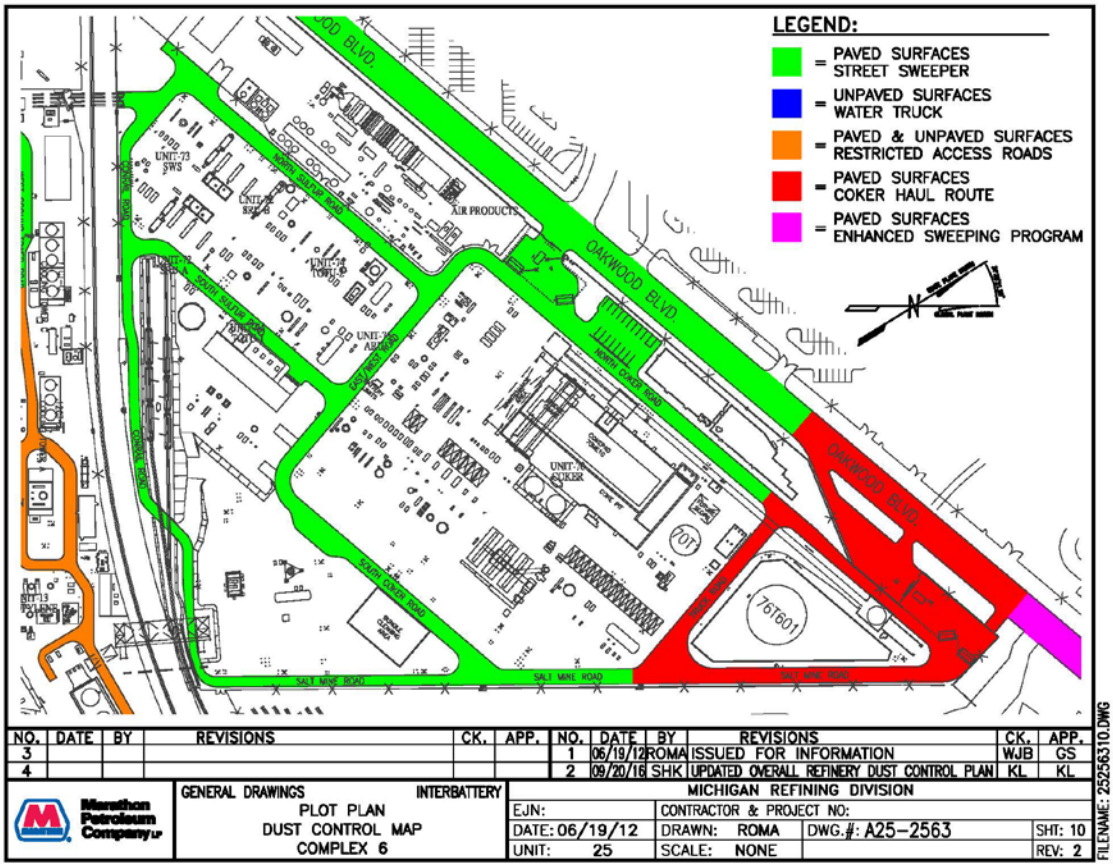
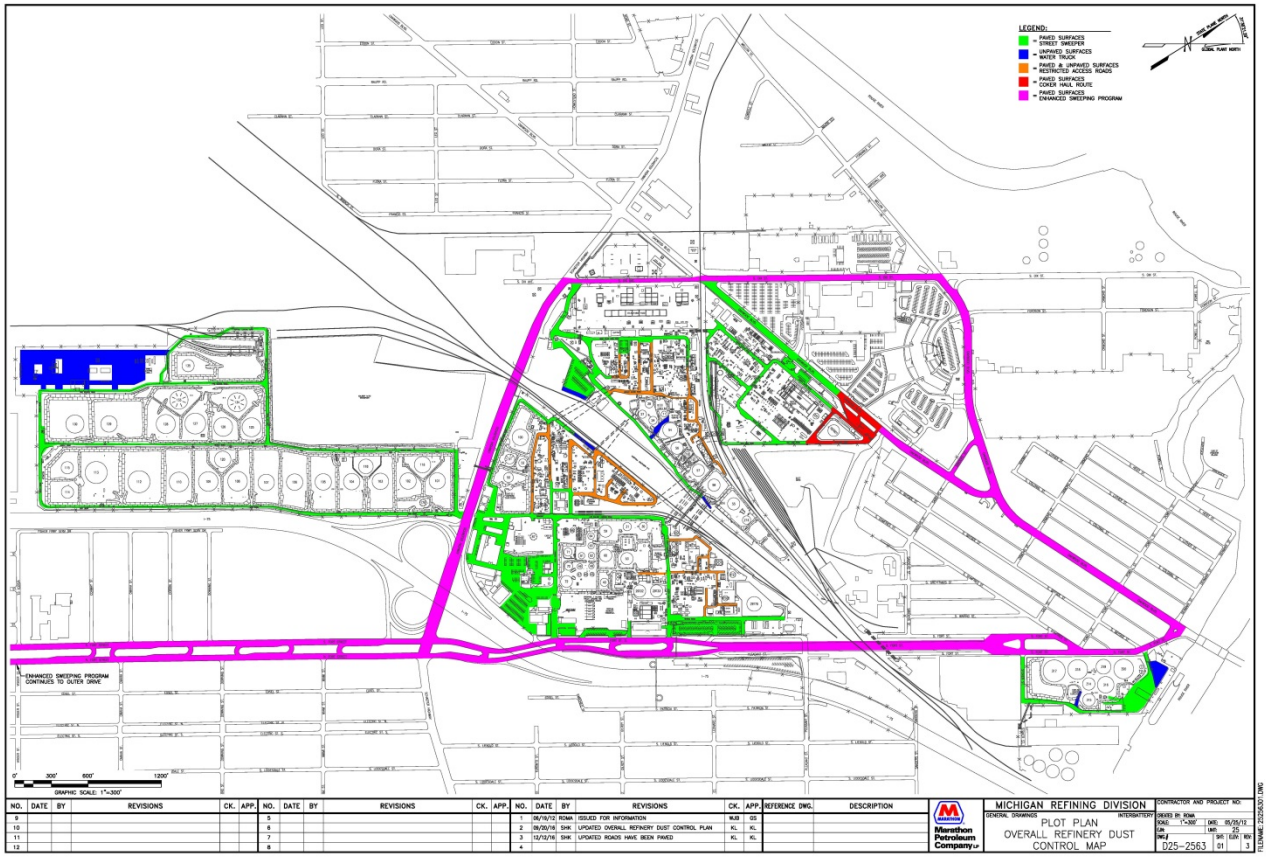


OVERALL REFINERY DUST CONTROL MAP



ATTACHMENT B
OFFSET CALCULATIONS

PM OFFSET CALCULATIONS

Option	Total Road Length (miles)	Pre-Controlled Emission Rate (tons/yr)	Controlled Emission Rate (tons/yr)	PM Emission Offset (tons/yr)
Original Sweeping Plan (55.9% Control) - Once Per Month Sweeping for 12 Months	8.3	188.4	121.0	67.4
Updated Route/Traffic Volumes (80% Control) - Twice Monthly Sweeping for 6 Months	8.9	220.6	151.2	69.5

PM10 OFFSET CALCULATIONS

Option	Total Road Length (miles)	Pre-Controlled Emission Rate (tons/yr)	Controlled Emission Rate (tons/yr)	PM10 Emission Offset (tons/yr)
Original Sweeping Plan (55.9% Control) - Once Per Month Sweeping for 12 Months	8.3	33.3	19.7	13.5
Updated Route/Traffic Volumes (80% Control) - Twice Monthly Sweeping for 6 Months	8.9	38.6	24.7	13.8

Notes:

[1] Based on the paved roadway predictive emission factor equation, AP-42, Section 13.2.1.

[2] Road traffic volume data obtained from SEMCOG and MDOT traffic databases.

[3] Mean vehicle weight based on an estimated average of passenger vehicles, pickup trucks, gravel trains, and semi-tractor trailors.

[4] Surface silt loading data obtained from AP-42, Section 13.2.1 and is dependent on the amount of vehicle traffic and type of precipation

[5] Existing road control program consists of sweeping primary roads only 4-5 times per year; therefore, emissions based on an assumed 10% control efficiency.

[6] Original control program consists of sweeping once per month; therefore, emissions based on an assumed 55.9% control efficiency based upon a study with similar control strategy.

Key changes since original submittal:

[1] Sweeping route (have eliminated a portion of Oakwood Blvd and have added a portion of Dix Rd and Sanders Rd).

[2] Road traffic volume data from SEMCOG and MDOT has been updated.

PM OFFSET CALCULATIONS

Location	Direction of Travel	Road Length (miles)	SEMCOG Traffic Volume[2] (vehicles/day)	MDOT Traffic Volume[2] (vehicles/day)	Selected Traffic Volume[2] (vehicles/day)	Mean Vehicle Weight[3] (tons)	Surface Silt Loading, Uncontrolled[4] (g/m2)	PM Emission Rate (lbs/VMT)	Uncontrolled Emission Rate (tons/yr)	Reduction Existing Sweeping[5] (%)	Controlled Emission Rate (tons/yr)	Silt Reduction[6] (By Enhanced Sweeping)	Surface Silt Loading, Enhanced (g/m2)	PM Emission Rate (lbs/VMT)	Controlled Emission Rate (tons/yr)	PM Emission Offset (tons/yr)
Fort Street (Outer Drive to Miami)	NB	0.97	9,800	14,800	9,800	5.6	0.06	0.0190	32.9	10	29.6	80.0%	0.012	0.0064	20.3	9.3
Fort Street (Miami to Schaefer)	NB	0.16	15,400	14,800	14,800	5.6	0.03	0.0119	5.2	10	4.6	80.0%	0.006	0.0039	3.2	1.5
Fort Street (Schaefer to Outer Drive	SB	1.15	6,800	14,800	6,800	5.6	0.06	0.0190	27.1	10	24.4	80.0%	0.012	0.0064	16.7	7.6
Fort Street (Schaefer to I-75 Entranc	NB	0.12	12,500	14,800	12,500	5.6	0.03	0.0119	3.3	10	2.9	80.0%	0.006	0.0039	2.0	0.9
Fort Street (I-75 Entrance to Oakwoo	NB	1.06	5,500	7,400	5,500	5.6	0.06	0.0190	20.2	10	18.2	80.0%	0.012	0.0064	12.5	5.7
Fort Street (Oakwood to Schaefer)	SB	1.20	5,500	7,400	5,500	5.6	0.06	0.0190	22.9	10	20.6	80.0%	0.012	0.0064	14.1	6.5
Oakwood (Sanders to Fort)	NB	0.44	4,300	ND	4,300	5.6	0.20	0.0420	14.5	10	13.1	80.0%	0.040	0.0145	9.0	4.0
Oakwood (Fort to Sanders)	SB	0.44	4,300	ND	4,300	5.6	0.20	0.0420	14.5	10	13.1	80.0%	0.040	0.0145	9.0	4.0
Dix (Sanders to Schaefer)	SB	0.63	5,400	ND	5,400	5.6	0.06	0.0190	11.8	10	10.6	80.0%	0.012	0.0064	7.3	3.3
Dix (Schaefer to Sanders)	NB	0.63	5,400	ND	5,400	5.6	0.06	0.0190	11.8	10	10.6	80.0%	0.012	0.0064	7.3	3.3
Sanders (Dix to Oakwood)	SB	0.32	1,000	ND	1,000	5.6	0.20	0.0420	2.5	10	2.2	80.0%	0.040	0.0145	1.5	0.7
Sanders (Oakwood to Dix)	NB	0.32	1,000	ND	1,000	5.6	0.20	0.0420	2.5	10	2.2	80.0%	0.040	0.0145	1.5	0.7
Schaefer (Dix to I-75)	EB	0.53	30,100	ND	30,100	5.6	0.03	0.0119	34.8	10	31.3	80.0%	0.006	0.0039	21.3	10.0
Schaefer (I-75 to Dix)	WB	0.53	30,100	ND	30,100	5.6	0.03	0.0119	34.8	10	31.3	80.0%	0.006	0.0039	21.3	10.0
Schaefer (I-75 to Fort)	EB	0.08	19,100	25,100	19,100	5.6	0.03	0.0119	3.3	10	3.0	80.0%	0.006	0.0039	2.0	1.0
Schaefer (Fort to I-75)	WB	0.08	19,100	25,100	19,100	5.6	0.03	0.0119	3.3	10	3.0	80.0%	0.006	0.0039	2.0	1.0
	Total:	8.7								Total:	220.6			Total:	151.2	69.5

PM10 OFFSET CALCULATIONS

Location	Direction of Travel	Road Length (miles)	SEMCOG Traffic Volume[2] (vehicles/day)	MDOT Traffic Volume[2] (vehicles/day)	Selected Traffic Volume[2] (vehicles/day)	Mean Vehicle Weight[3] (tons)	Surface Silt Loading, Uncontrolled[4] (g/m2)	PM10 Emission Rate (lbs/VMT)	Uncontrolled Emission Rate (tons/yr)	Reduction Existing Sweeping[5] (%)	Controlled Emission Rate (tons/yr)	Silt Reduction[6] (By Enhanced Sweeping)	Surface Silt Loading, Enhanced (g/m2)	PM10 Emission Rate (lbs/VMT)	Controlled Emission Rate (tons/yr)	PM10 Emission Offset (tons/yr)
Fort Street (Outer Drive to Miami)	NB	0.97	9,800	14,800	9,800	5.6	0.06	0.0034	5.8	10	5.2	80.0%	0.012	0.0009	3.4	1.8
Fort Street (Miami to Schaefer)	NB	0.16	15,400	14,800	14,800	5.6	0.03	0.0020	0.9	10	0.8	80.0%	0.006	0.0004	0.5	0.3
Fort Street (Schaefer to Outer Drive	SB	1.15	6,800	14,800	6,800	5.6	0.06	0.0034	4.8	10	4.3	80.0%	0.012	0.0009	2.8	1.5
Fort Street (Schaefer to I-75 Entranc	NB	0.12	12,500	14,800	12,500	5.6	0.03	0.0020	0.5	10	0.5	80.0%	0.006	0.0004	0.3	0.2
Fort Street (I-75 Entrance to Oakwoo	NB	1.06	5,500	7,400	5,500	5.6	0.06	0.0034	3.6	10	3.2	80.0%	0.012	0.0009	2.1	1.1
Fort Street (Oakwood to Schaefer)	SB	1.20	5,500	7,400	5,500	5.6	0.06	0.0034	4.0	10	3.6	80.0%	0.012	0.0009	2.4	1.3
Oakwood (Sanders to Fort)	NB	0.44	4,300	ND	4,300	5.6	0.20	0.0079	2.7	10	2.4	80.0%	0.040	0.0025	1.6	0.8
Oakwood (Fort to Sanders)	SB	0.44	4,300	ND	4,300	5.6	0.20	0.0079	2.7	10	2.4	80.0%	0.040	0.0025	1.6	0.8
Dix (Sanders to Schaefer)	SB	0.63	5,400	ND	5,400	5.6	0.06	0.0034	2.1	10	1.9	80.0%	0.012	0.0009	1.2	0.7
Dix (Schaefer to Sanders)	NB	0.63	5,400	ND	5,400	5.6	0.06	0.0034	2.1	10	1.9	80.0%	0.012	0.0009	1.2	0.7
Sanders (Dix to Oakwood)	SB	0.32	1,000	ND	1,000	5.6	0.20	0.0079	0.5	10	0.4	80.0%	0.040	0.0025	0.3	0.1
Sanders (Oakwood to Dix)	NB	0.32	1,000	ND	1,000	5.6	0.20	0.0079	0.5	10	0.4	80.0%	0.040	0.0025	0.3	0.1
Schaefer (Dix to I-75)	EB	0.53	30,100	ND	30,100	5.6	0.03	0.0020	5.8	10	5.2	80.0%	0.006	0.0004	3.2	2.0
Schaefer (I-75 to Dix)	WB	0.53	30,100	ND	30,100	5.6	0.03	0.0020	5.8	10	5.2	80.0%	0.006	0.0004	3.2	2.0
Schaefer (I-75 to Fort)	EB	0.08	19,100	25,100	19,100	5.6	0.03	0.0020	0.6	10	0.5	80.0%	0.006	0.0004	0.3	0.2
Schaefer (Fort to I-75)	WB	0.08	19,100	25,100	19,100	5.6	0.03	0.0020	0.6	10	0.5	80.0%	0.006	0.0004	0.3	0.2
	Total:	8.7								Total:	38.6			Total:	24.7	13.8

Notes:

[1] Based on the paved roadway predictive emission factor equation, AP-42, Section 13.2.1 (Nov. 2006).

[2] Road traffic volume data obtained from SEMCOG and MDOT traffic databases. Where data exists from both resources, the lower traffic volume was chosen. The traffic volume for Sanders street is an estimate based on location and low anticipated traffic volume.

[3] Mean vehicle weight based on an estimated average of passenger vehicles, pickup trucks, gravel trains, and semi-tractor trailors.

[4] Surface silt loading data obtained from AP-42, Section 13.2.1 and is dependent on the amount of vehicle traffic and type of precipation

[5] Existing road control program consists of sweeping primary roads only 4-5 times per year (per Bob Conrad, Wayne County); therefore, emissions based on an assumed 10% control efficiency.

[6] Proposed control program consists of sweeping once per month; therefore, emissions based on an assumed 55.9% control efficiency based upon a study with similar control strategy.

Key changes since original submittal:

[1] Sweeping route (have eliminated a portion of Oakwood Blvd and have added a portion of Dix Rd and Sanders Rd).

[2] Road traffic volume data from SEMCOG and MDOT has been updated.

[3] The length of Sanders Road that extends from Dix Road to Oakwood Boulevard has recently been renamed Oakwood Boulevard.

[4] Proposed control program consists of sweeping twice per month during the period May through October; therefore, emissions based on an assumed 80% control efficiency.