

Appendix C
Suncor Energy USA Commerce City Refinery Stormwater
Management Plan (SWMP)



Commerce City Refinery

Storm Water Management Plan

April 27, 2021
Revision 18

CCR-ENV 200.62


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1.0 INTRODUCTION

1.1 Purpose and Scope

In conformance with the Clean Water Act (CWA), the U.S. Environmental Protection Agency (EPA) has promulgated regulations to issue general permits for storm water discharges associated with industrial activity under the National Pollutant Discharge Elimination System (NPDES) program as defined in 40 CFR 122.21 and 40 CFR 122.26. NPDES permits are issued by states that have been delegated as NPDES-permitting authority, or by the EPA for states that have not been delegated NPDES-permitting authority.

The individual permit issued to Suncor requires the development and implementation of a Storm Water Management Plan (SWMP), as defined in the Federal Register Publication, September 1992, "EPA 832-R-92-006 Storm Water Management for Industrial Activities, Developing Pollution Prevention Plans and Best Management Practices." The regulatory content of this SWMP includes references to the related content requirements defined in EPA 832-R-92-006.

The purpose of this SWMP is to identify potential storm water pollution sources and to reduce the potential for pollutants reaching nearby waterways by establishing procedures and controls specific to the Suncor Energy (USA) Commerce City Refinery (Refinery). This SWMP accomplishes the following objectives:

- Identify pollutants that may come in contact with storm water.
- Establish measures to prevent pollutants from coming in contact with storm water.
- Establish controls to reduce or eliminate the potential for contaminated storm water being released to the environment.

The Refinery has the authority according to permit number COS000009 to discharge stormwater to Sand Creek and the South Platte River through the Colorado Discharge Permit System (CDPS). Refer to Section 1.2 for additional information about the permit.

The scope of this SWMP applies to the industrial facilities identified in Section 1.3.

1.2 Authority to Discharge

The Refinery is authorized to discharge stormwater associated with industrial activity and specified non-stormwater discharges, from the Refinery to State Waters, consistent with the terms and conditions of the CDPS COS000009 permit. Allowable discharges include:

- Stormwater discharges associated with primary industrial activity (SIC code 2911) and co-located industrial activity (SIC code 3599).
- Stormwater-specific effluent as regulated by the effluent limitation guidelines (ELGs) under 40 CFR Subchapter N Part 419 Petroleum Refining Point Source Category, See Part I.B.3.
- Discharges that are not otherwise required to obtain permit authorization but are commingled with stormwater discharges that are authorized by the permit.
- Stormwater run-on that commingles with stormwater discharges associated with industrial activity.

1.3 Facility Information

Table 1. Facility Information

Name of Facility	Suncor Energy Commerce City Refinery		
Location of Facility	Plant 1: 5801 Brighton Blvd., Commerce City, CO 80022 Plant 2: 5800 Brighton Blvd., Commerce City, CO 80022 Plant 3: 3875 E. 56th Ave., Commerce City, CO 80022 Nelson Property: 6215 Colorado Blvd., Commerce City, CO 80022	Name & Address of Owner or Operator	Suncor Energy (U.S.A.) Inc. 717 17th Street, Suite 2900 Denver, CO 80202
Standard Industrial Classification Code (SIC)	2911, 3599 (Nelson Property)	Type of Industry or Manufacturing	Petroleum Refining and Marketing
EPA ID Number	110015848813	Area of Impervious Surface	85 acres
Permit Number(s)	COS000009	Number of Outfalls	9 outfalls
Existing Permit Date	11/01/2012	Name(s) of Receiving Water(s)	Sand Creek, unnamed tributary to the South Platte River
Permit Expiration Date	10/31/2017 (under administrative extension)	Site Compliance Evaluation Interval(s)	Annual
This facility is subject to reporting requirements under EPCRA Section 313 for water priority chemicals.			

1.4 Key Contacts

Table 2. Key Contacts

SWMP Title	Contact Name	Phone Number(s)
Emergency Contact	ON-SHIFT OPERATIONS SUPERVISOR Operations	(303) 286-5749 (Office) (303) 304-8149 (Cell) RADIO UNIT 20 (Channel 4)
Environmental Contact (SWMP Administrator)	Eric Marler Senior Environmental Advisor	(303) 227-7524 (Office) (720) 305-6155 (Cell)
Facility Manager	Donald Austin Vice President of Refinery	(303) 286-5788 (Office)

1.5 General Facility Description

The Refinery is an onshore, non-production facility located in Commerce City, Colorado (southwestern Adams County). The Refinery is composed of three separate process areas called Plant 1, Plant 2, and

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Plant 3. Originally, Plants 1 and 3 (formerly referred to as the Denver Refinery or the West Plant) were owned and operated by ConocoPhillips Company, and were purchased by Suncor in August 2003. Plant 2 (formerly referred to as the East Plant) was owned by Valero Energy Corporation until June 2005, when it was purchased by Suncor.

The Refinery is a 98,000-barrel-per-day facility producing gasoline, diesel and distillate fuels, paving-grade asphalt, and other petroleum products. Crude oil is received by truck and pipeline, and finished products are shipped by truck, railcar, and pipeline. In addition, ethanol, butane, and various raw material chemicals arrive by railcar for use in the refining processes. A wastewater treatment plant (WWTP), located in Plant 1, receives and treats process waters generated during the processing and production of petroleum related products, which includes wastewater from the desalters, asphalt unit, tank water draws, hydrostatic test water, loading terminal runoff and truck wash water, process area, steam generation, cooling tower blowdown, and stormwater runoff. The Refinery also has an onsite wastewater treatment system that treats groundwater pumped from the groundwater recovery system located along an east-west line south of Sand Creek.

The Refinery encompasses approximately 274 acres of land. Highway 270 is located north of the Refinery, and Sand Creek is along the north and east boundary. Brighton Boulevard runs between the plants (east of Plant 1 and west of Plants 2 and 3). Burlington Ditch is along the far west boundary of the Refinery. Southwest of the Refinery is an office building owned by Suncor, the Refinery Business Center (RBC). There are two Suncor-owned buildings to the north of Highway 270: the Nelson Building and the ERT building. The Nelson Building is used for equipment maintenance, and the ERT building houses equipment used for spill and emergency response. To the south and east of the Refinery, private entities border 56th Avenue and York Street corridors. To the west is Metro Wastewater Reclamation District and Denver Water.

Oily and process wastewater, along with storm water that falls within the Refinery process units, is directed to oily-water or non-oily water sewers which are routed to the wastewater treatment plant (WWTP), located in Plant 1. This WWTP utilizes conventional activated sludge treatment technology. Discharges from this wastewater treatment plant are permitted under Colorado Discharge Permit System (CDPS) discharge permit CO0001147.

CDPS storm water discharge permit COS000009 and this SWMP address those areas of Suncor Energy Commerce City Refinery property that do not flow or drain to the Refinery WWTP.

1.6 Distribution List

This SWMP is maintained onsite and is available for review by the EPA Regional Administrator, State Permitting Authority, and local Municipal Storm Sewer System Operator, as necessary. If this SWMP is combined with other environmental response plans, a copy shall be provided to the State Emergency Response Commission (SERC), Local Emergency Planning Committee (LEPC), and other local authorities.

2.0 STORM WATER MANAGEMENT PLAN (SWMP) TEAM

2.1 Team Development

All facilities required to develop a SWMP must establish a Storm Water Management Plan Team. Included on the team shall be a member of the plant manager's staff. In addition, the team should comprise representatives from the following functions listed below. The Storm Water Management Plan Team for the Refinery is identified in Section 2.2.

- Plant engineering
- Material handling
- Production
- Maintenance

- Consultant (optional)
- Security (optional)

2.2 SWMP Team Roster and Responsibilities

Table 3. Storm Water Management Plan Team Roster and Responsibilities

Team Leader (SWMP Administrator)			
Name and Title	Eric Marler Senior Environmental Specialist	Contact Numbers	(303) 227-7524 (Office) (720) 305-6155 (Cell)
Responsibilities			
<ul style="list-style-type: none"> • Provide overall team leadership. • Ensure plan certification and permit compliance remains in effect. • Plan and schedule regular plan reviews and site compliance evaluations at required intervals. • Coordinate plan re-certification as required. • Assign action items to team members, as necessary, for follow-up and resolution. • Maintain direct line of communication with facility management for prompt resolution of potential compliance issues. 			
Team Members			
Name and Title	Wes McNeil Environmental Team Lead	Contact Numbers	(303) 286-5731 (Office) (720) 838-1644 (Cell) (303) 582-2063 (Home)
Name and Title	Jeff Osetek Emergency Response Coord.	Contact Numbers	(303) 286-5758 (Office) (303) 656-5883 (Cell)
<ul style="list-style-type: none"> • Identify pollutant sources that may come in contact with storm water. • Establish and maintain spill response and notification procedures. • Provide awareness training in storm water pollution prevention to employees who are required to respond to spills and initiate cleanup. • Coordinate interdepartmental efforts to implement SWMP. • Develop and implement best management practices to prevent storm water pollution. • Document and maintain records of preventive measures. • Evaluate the need for structural controls. • Review construction plans and activities to minimize impact on storm water runoff. • Review process changes and the potential impact on storm water pollution. • Annually review SWMP for its effectiveness and keep updated. 			

3.0 FACILITY MAPS AND DIAGRAMS

The facility maps and diagrams contained in this SWMP include the following information:

- A Topographic Map is provided that illustrates the facility location and nearby surface waters.
- A Site Plan is provided that illustrates the following facility drainage information, including:
 - Permanent structures such as buildings, roadways, and parking lots noting impervious areas
 - Natural water bodies
 - Outfalls, and specifically existing NPDES permitted outfalls by number

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- Receiving waters or municipal storm sewers (as appropriate)
- Surface flow and runoff directions within facility
- Major storm and sanitary sewer routes
- Storm water structural controls
- Flow diversion
- Retention and detention ponds
- Oil and water separators
- Vegetative swales and drainage ditches
- Vegetative areas including lawns, woodlots, and natural growth areas
- Snow dumping sites
- Storm water inlets and outfall drainage area (as necessary per state requirements)
- Significant material and locations of exposed and potentially exposed material to storm water, including:
 - Bulk storage tanks and process tanks
 - Major pipelines and/or process sewers
 - Drum storage areas
 - Coal and salt piles
 - Equipment storage areas
 - Fueling stations
 - Loading and unloading areas including chemical shipping and receiving docks
 - Waste management areas
 - Outdoor manufacturing areas
 - Vehicle and equipment washing and maintenance areas
 - Erodible surfaces and/or areas where significant sediment is generated
 - Areas where past spills or leaks have occurred
 - Main vehicular traffic areas where material is routinely routed
 - Containment structures that exist or need to be added
 - Potential areas of concern (as necessary per state requirements)
 - Contaminated areas (as necessary per state requirements)

4.0 POTENTIAL POLLUTANT SOURCES

4.1 Material Inventory – Potential Pollutant Sources

Appendix B provides a listing of materials and activities which may be reasonably expected to affect the quality of storm water discharges at the Suncor Energy Commerce City Refinery.

4.2 Best Management Practices for Pollutant Sources

Table 4 addresses pollutant sources identified in Section 4.1 and best management practices (BMPs) that are in place to control these potential pollutant sources. New BMP options that are incorporated into the plan, if necessary, to address planned changes (e.g. new installations or construction) that may affect pollutant sources are also discussed.

Table 4. Best Management Practices for Pollutant Sources

Pollutant Sources Material or Activity	Existing Management Systems	New BMP Options
Bulk Oil Storage	Ongoing visual inspections by operating personnel; Storage tank secondary containment structures (e.g. earthen and concrete dikes and perimeter tertiary containment structures); deadman switches and valves on fuel transfer pumps; high and low level alarms on tank to prevent overfilling.	Proposed project for tank dike armoring to reduce soil erosion from dikes and berms plant-wide.
Soil and sediment runoff from construction/excavation areas	Project-specific BMPs for erosion and sediment control are to be implemented prior to soil disturbance. BMP requirements should be evaluated on a case-by-case basis.	In some cases, contractors will be required to develop BMPs and a site-specific Storm Water Management Plan.
Scrap/Surplus Materials Storage	Prohibition of scrap/surplus materials storage that may contain deleterious or hazardous wastes within any of the storm water control areas.	Areas to be protected via storm water detention ponds.
Chemical Storage and Waste Paint Storage	Vigilance by personnel, protection from rain/precipitation exposure, secondary containment where appropriate.	
Drum Storage and Hazardous Waste Storage	All drums and containers identified and closed/secured with lids. Spills or leaks immediately cleaned-up per RCRA. Secondary containment structures intact and secure. Inspections occurring on a regular basis by operating personnel.	Hazardous Waste Storage area was commissioned in 2006.
Groundwater Treatment Chemical Storage	Groundwater treatment chemical storage is covered and protected.	N/A
General Refinery Storm Water Runoff	Berms and surface structures to limit uncontrolled movement of storm water runoff. In addition, the facility maintains the following storm water retention areas: Storm Water Area 1 (SWA-1), Storm Water Area 2 (SWA-2), and Storm Water Area 3 (SWA-3).	Maintain structural controls as designated in Drawing 005-CV-D-005, Surface Drainage Features and Primary Structural Control Measures

Pollutant Sources Material or Activity	Existing Management Systems	New BMP Options
Vehicle and Equipment Maintenance	Vehicle maintenance supplies, drums, equipment must be maintained in an enclosed shelter. Lubricants and fluid containers (for both new and used products) are to be maintained under covers protected from precipitation.	New storm water retention pond and storm water discharge structures have been constructed at the Nelson Property to control storm water discharge from the maintenance areas.

4.3 Spill History

Appendix C identifies all spills or leaks of a reportable quantity reported to an outside agency, or that had the potential to impact the facilities stormwater discharge under the discharge permit prior to cleaning up the spill.

4.4 Non-Stormwater Discharges and Emergency Fire Fighting

To evaluate non-storm water discharge, storm water outfalls must be inspected and tested per the requirements of the facility's application for an NPDES permit. Inspection and testing are required to ensure that no illicit non-storm water connections to the storm water system exist. Examples of non-storm water discharges include any water used directly in the manufacturing of process and sanitary wastes. To check for non-storm water discharges, one of the following three common dry weather tests can be used:

- Visual inspection
- Plant schematic review
- Dye testing

Table 5 lists authorized non-storm water discharges and emergency firefighting discharges.

Table 5. Authorized Non-Storm Water Discharges and Emergency Fire Fighting

Discharge Source	Estimated Frequency
Untamated condensate from air conditioners, coolers, and other compressors and from the outside storage of refrigerated gases or liquids.	Not expected
Landscape watering provided all pesticides, herbicides, and fertilizers have been applied in accordance with the approved labeling.	Not expected
Untamated spring water.	Not expected
Foundation or footing drains where flows are not contaminated with process materials.	Not expected
Incidental windblown mist from cooling towers that collects on rooftops or adjacent portions of the facility but not intentional discharges from the cooling tower (e.g. "piped" cooling tower blowdown or drains).	Not expected
Fire Fighting Response – Fire Water and Aqueous Film Forming-Foam (AFFF) Application. (Note: The fire water system supply for the facility is treated process wastewater via the wastewater treatment system.)	These discharges are to occur only during emergency -related fire or vapor release scenarios.

Refer to Appendix D for Monthly Inspection Forms.

The Refinery eliminated non-stormwater discharges not authorized by the NPDES permit through best management practices. The following non-storm water discharges are authorized by the general permit

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and are expected to be present in storm water following implementation of structural and non-structural preventive measures and source controls.

4.5 Waste, Garbage, Floatable Debris and Dust Generation

The Refinery minimizes the discharge of waste, garbage, and floatable debris from the site by keeping exposed areas free of such materials. The Plant 1 WWTP intercepts these materials before they would be discharged. The Refinery minimizes generation of dust and off-site tracking of raw, final, or waste materials through best management practices.

4.6 Site Evaluation of Potential Pollutant Sources

The following facility areas and activities have been evaluated for potential pollutant sources with a high potential to contaminate storm water, including those associated with materials loading and unloading, outdoor storage, outdoor manufacturing or processing, onsite waste disposal, and significant dust- or particulate-generating activities.

4.6.1 General Site Description

Plant 1 is located on relatively level terrain. Topography and general surface water flow is north and west – generally toward Sand Creek and the South Platte River. Sand Creek runs adjacent to the Refinery, and comprises the north and east boundary of the property. Sand Creek flows to the northwest and joins the South Platte River approximately 1/3-mile downstream of the facility boundary.

Plant 2 was purchased by Suncor Energy Commerce City Refinery from Colorado Refining Company/Valero Energy in 2005. The site is predominately level, and consists of refinery process units, tank farm areas, loading/unloading racks, and property areas for future development. Drainage from most of the process and tank farm areas flows generally north and northeast toward Sand Creek. The southern end of Plant 2 (primarily non-process and non-tank farm areas) drain to the south and southwest into an unnamed tributary to the South Platte that generally follows into an existing railroad right-of-way.

Plant 3 is located on relatively level terrain. General storm water flow direction is gentle to the north and west. Drainage generally flows northward toward Sand Creek, which comprises the northern property boundary for the site. Storm water impacting the process unit and tank farm areas is discharged through Outfall 004A to Sand Creek or, more typically, transferred via piping to the WWTS in Plant 1.

4.6.2 Storm Water Area 1 (SWA-1)

This area is adjacent to Sand Creek, north and northwest of tanks T-774, T-775, T-776, T-777, and T-778 (See Figure 1). There is a storm water detention area at the northwest corner of Plant 1 that collects run-off from areas outside diked tank storage in the north section of the plant. Under normal rainfall events, there is no discharge from this storm water detention area. If there is a significant enough quantity of runoff to overtop the detention area, flow will occur over the existing roadway towards the north into Sand Creek (Outfall 023A). In this area of the plant, the storage tanks are predominant features, with areas outside the diked containment being primarily used as a storage area for spare refinery parts and equipment. Crude truck unloading takes place south of T-776, adjacent to 60th Avenue. A crude pipeline station is located north of T-777. Also of significance in this area are facilities associated with the soil/groundwater remediation measures underway via a RCRA Order involving ConocoPhillips and Suncor Energy (U.S.A.).

Infrequently, this area may be utilized as a site for temporary office trailers/buildings and associated personnel parking.

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Precipitation falling on and around T-774, T-775, T-776, T-777, and T-778 is captured in the earthen dikes constructed as secondary containment, and is not expected to be part of storm water runoff. Storm water in the area of the crude station is contained within a concrete curb and collected in a sump. Storm water contamination potential for this area is low to moderate.

SWA-1 Potential Sources for Contaminants in Storm Water Runoff:

- Crude oil/oil products from pump or piping leak
- Crude oil from catastrophic truck unloading incident
- Spill of scale inhibitor or pH adjustment chemicals from outside of their designated secondary containment area (groundwater treatment system)
- Spills or leaking vehicles in employee/contractor parking area
- Soil erosion from exposed soils, tank dikes, and construction activities

4.6.3 Storm Water Area 2 (SWA-2)

SWA-2 is a unique drainage area west and north of Tank 774, bordered on the south by 60th Avenue. (See Figure 2) The western border of this area is the fenceline shared by Metro Wastewater Reclamation District. Activities/materials in SWA-2 are not inside diked tank storage including surplus material storage, parking, and a maintenance facility (contained within a metal building). This area is used as a holding/dewatering area for hydro-vacuum excavated soil materials (held within a constructed soil pit) infrequently.

Storm water runoff from this area travels west by sheet flow to an asphalt lined swale just west of the western property boundary. Water in the swale flows north along the fenceline until reaching a point where it travels through a buried culvert back onto the Refinery property and into the detention area located in SWA-1.

SWA-2 Potential Sources for Contaminants in Storm Water Runoff:

- Soil/sediment
- Vehicle oil drips and leaks
- Deleterious materials on scrap subject to precipitation wash-off
- Spills and poor housekeeping around mechanical shop area
- Wash-out or erosion from hydro-vacuum excavated soil dewatering.

4.6.4 Storm Water Area 3 (SWA-3)

Movement of storm water to and from the Brighton Boulevard right-of-way adjacent to the Plant 1 may occur under certain precipitation or spill conditions (see Figure 3). This water may move north and be intercepted by a public storm drain system located near the Refinery North Gate. Documented spills of molten sulfur and fire water have occurred in one portion of SWA-3. The potential for oil or process unit fluids is minimal, but must be considered for contingency planning.

A Refinery drain is located on the sulfur railroad spur. In the event this drain is unable to manage the volume of stormwater, stormwater that leaves the site at this location would be considered Outfall 025A. SWA-3 Potential Sources for Contaminants in Storm Water Runoff:

- Mobile equipment storage
- Transformer leak/failure
- Molten sulfur
- Process unit oil or chemicals

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4.6.5 Storm Water Area 4 (SWA-4)

Suncor Energy Commerce City Refinery owns and operates a maintenance facility, referred to as the “Nelson Property”, that is located north of the Plant 1 on Brighton Boulevard, as shown in Figure 4. This facility includes the following features and activities:

- Fuel truck parking
- Parts laydown and storage
- Fabrication and maintenance shops
- Electrical transformer
- Truck wash building with drum storage of used oil and motor oil
- Roll-off boxes with soil, scrap and miscellaneous debris
- Employee parking

The facility is situated primarily on a soil/gravel surface with small areas of pavement. The west side of the facility slopes slightly to the west towards a storm water detention pond, in the event of heavy enough runoff to overtop this pond, discharge would occur onto the adjacent property toward the west (Outfall 022A). The east or “front” side of the facility slopes slightly to the east and north. Storm water would exit the property at a constructed outlet structure in to the ditch along Colorado Blvd. (Outfall 021A). Storm water runoff contamination potential for this area would be classified as moderate.

SWA-4 Potential Sources for Contaminants in Storm Water Runoff:

- Equipment storage
- Transformer leak
- Fuel truck leak
- Diesel or gasoline spill or leak during tank filling or vehicle re-fueling
- Oil spill or leak during drum transport
- Leak from roll-off boxes
- Maintenance activity residues or wastes

4.6.6 Storm Water Area 6 (SWA-6)

A small area exists in the southeast portion of the Plant 3 tank farm, which, although graded to minimize offsite storm water runoff, could possibly convey minimal sheet flow offsite during significant storm events (Figure 6). The actual area not controlled by surface structures is less than 2 acres. This area is used infrequently for staging of materials, surplus material storage, storage of temporary tanks, temporary equipment cleaning operations, and overflow parking during facility turnarounds and maintenance activities.

Sheet flow produced would flow east and northeast into the right-of-way adjacent to Sand Creek. This area is covered by scrub vegetation and exposed soil and has minimal slope. Under normal circumstances the potential for storm water contamination is low. The risk of unintended discharge of oil or waste materials during infrequent equipment operations is greater. A management practice utilized during such operations is the maintenance of a soil berm which will abate surface flow to the Sand Creek area, and instead route water west to be intercepted by the Plant 3 east boundary trench (leading to Mary’s Pond, a controlled detention structure).

SWA-6 Potential Sources for Contaminants in Storm Water Runoff:

- Hazardous or toxic materials on scrap subject to precipitation wash-off

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- Temporary tank leakage
- Spills or leaking vehicles in employee/contractor parking area
- Oily waste from material cleaning/pressure-washing activities

4.6.7 Storm Water Area 7 (SWA-7)

There is a small area at the northwest corner of Plant 3 where run-off could historically exit the facility to the north along the north entrance road. A culvert is now in place directing the flow of storm water in this area to Mary's Pond. There is minor potential for storm water that has been exposed to process areas on the extreme north end of the plant to flow off site at this point. There is also minor potential for this flow to reach Sand Creek. The potential for storm water contamination is minimal.

SWA-7 Potential Sources for Contaminants in Storm Water Runoff is process equipment leaks or spills.

4.6.8 Storm Water Area 8 (SWA-8)

Storm water not captured by Refinery area drains, along with precipitation impacting the parking and office areas of Plant 2 will flow to the extreme north end of the plant to a concrete retention basin (Figure 8). Storm water may be detained in this basin, pumped back to wastewater treatment, or allowed to evaporate. Storm water discharge to Sand Creek will only be allowed if the storm water is of acceptable water quality. In the event of discharge to Sand Creek, the discharge point for this flow is identified as Outfall 024A. The potential for storm water contamination is moderate.

SWA-8 Potential Sources for Contaminants in Storm Water Runoff is process equipment leaks or spills.

4.6.9 Storm Water Area 9 (SWA-9) – Parcel II

Parcel II is located directly south of the main refinery property across 56th Avenue, as indicated in Figure 9. Crude oil truck unloading, LPG railcar loading and unloading, ethanol railcar unloading, gasoline and diesel fuel railcar loading, and a refinery fire station are located on Parcel II. Outside equipment laydown is also located in this area.

Parcel II covers approximately 16 acres. Flow is generally to the south and southeast to a retention pond at the very southwest end of the parcel. This pond has no outlet. There is also a small storm water collection basin in a low area near the center of the parcel – collected water is allowed to evaporate or infiltrate. (These two structures effectively work in series configuration.) Drainage ditches, railroad ROWs and the topography direct run-off to the retention pond. The majority of runoff from Parcel II appears to infiltrate. Due to the strategic grading and routing of runoff into these basins, the potential for release of storm water contamination is low.

A very large precipitation event or catastrophic spill in the area that would overwhelm or over-top the detention basins would create flows into the un-named creek at the far south end of the parcel. This creek runs adjacent to the railroad right-of-way, west, and into the South Platte River (Outfall 028A).

SWA-9 (Parcel II) Potential Sources for Contaminants in Storm Water Runoff:

- Spills or leaks of raw and finished liquid materials from rail cars and trucks – LPG, ethanol, gasoline, diesel, crude oil
- Spills or leaks from chemical containers during operator transfer
- Soil sediments due to surface erosion and/or construction activities

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4.6.10 Storm Water Area 10 (SWA-10) – Parcel IV

Parcel IV is located approximately 1000 feet east of the Plant 12 process area, and is adjacent to the East Tank Farm (to the west) and the Plant 3 (to the north) (Figure 10). Parcel IV is approximately 3 acres in size and is primarily an equipment laydown area that is essentially level. With most rainfall events, precipitation would tend to remain and infiltrate. However, a large rain event may cause flow to the north into the Plant 3.

Just to the south of this laydown area is an area called the Odyssey Staging Area. It is also graded relatively flat and is used for temporary equipment storage and parking. Heavy rainfall would cause run-off to the south onto 56th Avenue. The potential for storm water contamination from both areas is minimal.

SWA-10 (Parcel IV) Potential Sources for Contaminants in Storm Water Runoff:

- Spills or leaks from temporary tanks or equipment
- Spills or leaking vehicles in employee/contractor parking area

4.7 State-specific Requirements

The following state-specific requirements are applicable to this facility and additional facility and plan information regarding these requirements is provided.

4.7.1 Colorado Industrial Storm Water Permit (CDPS Permit No. COS000009)

The permit requires development and implementation of a storm water management plan emphasizing storm water best management practices (BMPs).

4.7.2 Description of SIC-Covered Industrial Activities Regulated Under the Storm Water Discharge Permit

While the majority of industrial processes at the Refinery are within an area of drainage specifically designed to capture and treat water prior to discharge authorized by an NPDES wastewater permit, some areas of the facility fall outside of the area designed for process water capture. These areas are subject to control under the storm water permit program.

Three refining trains are in place: "Plant 1", located West of Brighton Boulevard, "Plant 2", located East of Brighton Boulevard, and "Plant 3" located east of Plant 2. Combined refining capacity through these processing units is approximately 98,000 barrels of crude oil per day.

Refining processes begin with three atmospheric and vacuum distillation units to fractionate the incoming crude oils. Prior to distillation, the incoming crude oils are "desalted", which is the process that contacts crude with water to remove any inorganic salts that are naturally occurring in the crudes. Some of the fractions from the crude distillation process are "sweetened" by processing through three separate hydrodesulfurization units, each one specifically designed to treat a particular type of hydrocarbon stock.

The remaining fractions from crude distillation and the desulfurized intermediates proceed further through several intermediate refinery process units that include a fluid catalytic reforming unit. Each of these process units is designed to yield motor fuel blend stocks to be blended to finished motor gasolines and diesel fuels. Petroleum products produced by this facility include liquefied petroleum gas, motor gasolines, jet fuel, diesel fuels, fuel oil, and asphalt. Asphalt is the product from the vacuum distillation section of the crude distillation units.

Industrial activities associated with the storm water runoff areas are limited to the following:

- Tank storage of crude oil and intermediate distilled products

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- Pumping of crude oils and intermediate stocks
- Offloading of crude oils from over-the-road cargo tanks
- Conveyance of crude oils and products in above-ground and below-ground piping
- Pumping and treatment of groundwater necessary to accomplish a joint-facility remediation effort
- Painting, sandblasting, and associated material storage
- Vehicle maintenance
- Storage of surplus and scrap industrial materials
- Employee parking areas

Acreege breakdown for the facility is as follows:

- SWMP covered area (not controlled via CDPS Wastewater Discharge Permit CO-0001147): ≈45 acres
- Process area and tank farm runoff controlled via CDPS Permit CO-0001147: ≈81 acres

5.0 NOTIFICATION, REPORTING, AND RESPONSE PROCEDURES

5.1 Contact Directories

Refer to Release Reporting Program Manual, for the most current, detailed description of Refinery notification procedures.

5.2 Response Actions

5.2.1 Spill Response Actions

5.2.1.1 Discovery/First Person On-scene

1. Log of incident events.
2. Notify personnel in immediate area. Activate local alarms, as appropriate.
3. Notify Supervisory Personnel/Report the incident.
4. Advise personnel in the area of any potential threat and/or initiate evacuation procedures.
5. If safe to do so, take the following actions commensurate with Level of Training:
 - Stop flow of material
 - Ensure spill is contained, block material from entering sewers, drains, and/or sumps
 - Eliminate possible sources of ignition
 - Deploy emergency spill kits or equipment locally available

5.2.1.2 Supervisory Personnel

1. Restrict access to the incident scene and surrounding area as the situation demands. Take any other steps necessary to minimize any threat to health and safety.
2. Request medical assistance, if an injury has occurred.
3. Verify that incident has been properly reported and response resources have been dispatched, as necessary.

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4. Verify the type of product and quantity released; request/obtain Material Safety Data Sheets as necessary.
5. Identify/isolate the source and minimize the loss of product.
6. Coordinate further initial response actions with the Incident Commander and/or Discharge Response Coordinator.
7. Make appropriate internal notifications.

5.2.1.3 *Incident Commander*

1. Activate the emergency response resources, as the situation demands.
2. Activate additional external response contractors and resources, as the situation demands.
3. Evaluate the Severity, Potential Impact, Safety Concerns, and Response Requirements based on the initial information available.
4. Confirm safety aspects at site, including personal protective equipment, isolation of ignition sources, and potential need for evacuation.
5. Provide incident briefing to Emergency Coordinator and implement agreed priorities and objectives.
6. Keep Facility Management advised of incident status.
7. Direct response and clean-up operations.

5.2.1.4 *Emergency Coordinator*

1. Interface with Incident Commander to align and agree on response priorities and objectives
2. Complete required external notifications
3. Document response actions, including:
 - Log of incident events
 - Log of Response Personnel and exposure time
4. Facilitate post-incident debriefings, as necessary
5. Conduct post-incident investigations, as required
6. Revise and update emergency response plan(s), as necessary

Table 6. Spill Mitigation Procedures

Type	Mitigation Procedure
Failure of Transfer Equipment	<ol style="list-style-type: none"> 1. Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Terminate transfer operations and close block valves. 3. Drain product into containment areas, if possible. 4. Eliminate sources of ignition.
Tank Overfill/Failure	<ol style="list-style-type: none"> 1. Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Shut down or divert source of incoming flow to tank. 3. Transfer fluid to another tank with adequate storage capacity, if possible. 4. Shut down sources of ignition. 5. Ensure that dike discharge valves are closed. 6. Monitor diked containment area for leaks and potential capacity limitations. 7. Begin transferring spilled product to another tank as soon as possible.
Piping Rupture/Leak (under pressure and no pressure)	<ol style="list-style-type: none"> 1. Personnel safety is the first priority. Evacuate nonessential personnel or personnel at high risk. 2. Shut down pumps. Close the closest block valves on each side of the rupture. 3. Drain the line back into contained areas, if possible. 4. Shut down sources of ignition. 5. If piping is leaking and under pressure, relieve pressure by draining into a containment area or back to a tank, if possible. Repair line according to established procedures.
Fire/Explosion	<ol style="list-style-type: none"> 1. Personnel safety is the first priority. Evacuate nonessential personnel or personnel at risk of injury. 2. Notify local fire and police departments. 3. Attempt to extinguish fire if in incipient (early) stage. 4. Shut down transfer or pumping operation. Attempt to divert or stop flow of product to the hazardous area, if it can be done safely. 5. Eliminate sources of ignition. 6. Control fire before taking steps to contain spill.

6.0 SAMPLING DATA

A summary of existing storm water discharge sampling results describing pollutants, suspected sources, quality of discharges, and problems that have occurred during the previous three years is contained in Table 7. Parameters used for storm water sampling are identified in Section 9.5.

Table 7. Summary of Storm Water Sampling Data

Date	Outfall	O&G (mg/l)	TOC (mg/l)	Se, PD (µg/l)	pH	Benzene (µg/l)	MTBE (µg/l)
1/20/2017	023A	ND	19	10.6	7.4	ND	ND
5/8/2017	026A	0.5	7	15.6	8.8	ND	ND
10/9/2017	028A	1.4	36	2.5	7.6	ND	ND
3/20/2020	004A	2.2	22	11.7	7.3	0.17	ND
3/20/2020	004A	0.4	20	5.4	7.0	ND	ND

7.0 PREVENTATIVE MEASURES, SOURCE CONTROLS, AND BEST MANAGEMENT PRACTICES

The Refinery is required to minimize the exposure of pollutant sources associated with manufacturing, processing, and material storage areas (including loading and unloading, storage, disposal, cleaning, maintenance, and fueling operations) to rain, snow, snowmelt, and runoff. Minimizing exposure at the Refinery is described by non-structural and structural controls and BMPs implemented throughout the facility as discussed in Section 7.1 and 7.2.

7.1 Non-structural Controls

Non-structural controls are non-physical means of reducing the potential for contact between storm water and significant materials at the source. Refer to Section 7.1.7 for non-structural controls and best management practices implemented at the Refinery.

7.1.1 Good Housekeeping

Good housekeeping consists of keeping clean all areas exposed to stormwater runoff, as necessary to minimize potential sources of pollutants. Site housekeeping activities include the following:

- Pickup and disposal of trash and debris;
- Presence of full-time waste coordinators who manage all solid waste generation and disposal;
- Plentiful dumpsters, drums and other waste-specific receptacles;
- Materials are inspected regularly and maintained in an orderly fashion with labels;
- Materials are stored in appropriate containers for the contents stored;
- Company programs to enhance employee participation and ownership of housekeeping activities.

7.1.2 Materials Handling

- Chemicals will be handled in a manner that minimizes the possibility of leaks or spills, usually by providing secondary containment, spill response equipment, and employee training. Suncor's materials handling equipment is operated to minimize potential discharges of chemicals.
- Drain valves are inspected to ensure they are closed before loading commences. Trucks and tank cars are inspected for problems before and after loading. The lowermost drain in the tank car/truck is examined for leakage prior to filling and departure.
- Storage of any scrap/surplus materials that may contain deleterious or hazardous wastes within any of the storm water control areas is prohibited.

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7.1.3 Inspections

- All aboveground bulk storage containers and piping are periodically integrity tested according to SPCC requirements, ASTM guidance and good engineering practices.
- Ongoing visual inspections conducted by operating personnel.
- An ongoing employee audit program is conducted with a checklist inspection sheet for storm water control areas. BMPs, spill prevention and response, and housekeeping issues are emphasized.
- The disposition of storm water accumulated in tank berms depends on its quality, which is checked by operators through an inspection process before deciding the proper storm water management.

7.1.4 Preventative Maintenance

The Refinery Maintenance Department performs preventative maintenance on the refinery equipment. The Maintenance Department maintains an onsite presence five days a week and is continuously on call.

Visual inspections of piping and process equipment are performed by Operations personnel on a routine basis. Any exceptions noted, or maintenance work required is managed via an enterprise system. Maintenance functions related to storm water compliance may be handled by contract and/or contractor personnel, receiving direction from Suncor Operations, Maintenance, or Environmental functions.

7.1.5 Sediment and Erosion Control

Most areas of the facility consist of stabilized surfaces that are infrequently disturbed. For these areas, the potential for significant erosion is minimal. Periodic inspections are conducted to identify areas that may have been disturbed and/or have a reasonable potential of producing sediment-laden runoff.

7.1.6 Spill Prevention and Response

- The primary resource document for the management of spills is the facility Spill Prevention, Control and Countermeasure (SPCC) Plan and Facility Response Plan (FRP), hereby made a part of this plan by reference.
- Procedures are in place for regularly inspecting, testing, maintaining, and repairing all industrial equipment and systems to avoid situations that may result in leaks, spills, and other releases of pollutants in stormwater discharged to receiving waters.
- Procedures for plainly labeling containers that could be susceptible to spillage or leakage to encourage proper handling and facilitate rapid response if spills or leaks occur have been developed.
- Procedures have been developed specific to the Refinery that detail stopping, containing, and cleaning up leaks, spills, and other releases.
- Employees at the Refinery are trained to notify the appropriate facility personnel, emergency response agencies, and regulatory agencies in the event of a spill.
- A trained and staffed internal emergency response team is kept onsite at all times.

7.1.7 Area-specific BMPs – Outfalls 004A, 023A, 024A, and 027A

Prior to any discharge, the water is visually inspected for any signs of contamination or deleterious constituents. Sampling shall be conducted in compliance with the requirements of the permit.

7.2 **Structural Controls**

Where implementation of the measures required by the general permit does not control storm water discharges in accordance with Water Quality Standards, the SWMP shall provide a description of the location, function, and design criteria of structural controls for prevention and treatment. Structural controls

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may be necessary to prevent uncontaminated storm water from contacting or being contacted by significant materials or if preventive measures are not feasible or are inadequate to keep significant materials at the site from contaminating storm water. Structural controls shall be used to treat, divert, isolate, recycle, reuse, or otherwise manage storm water in a manner that reduces the level of significant materials in the storm water and provides compliance with Water Quality Standards. The structural controls include physical structures to prevent or minimize the direct contact of storm water with sources of significant materials. Refer to Section 7.2.1 for structural controls and best management practices implemented at this facility.

7.2.1 Structural Controls and Best Management Practices (BMPs)

7.2.1.1 Materials Handling and Good Housekeeping

- All chemicals will be stored in closed containers. The Refinery strives to keep all chemicals stored in covered buildings to prevent storm water contact and minimizes the amount of material that is stored outside. The materials and construction of all bulk storage containers are compatible with the material stored and the conditions for storage (e.g., temperature, pressure, etc.).
- Groundwater treatment chemical storage is covered/protected.
- Physical barriers to vehicle movement (e.g., chocks, brakes, truck engine off) are part of the Operating Procedures for both rail-car and truck loading/unloading operations.
- The loading/unloading transfer areas are designed to contain at least the maximum capacity of any single compartment of a tank car or tank truck loaded or unloaded in the Refinery. In the event that a spill leaves a loading/unloading transfer area, it will be contained by tertiary containment structures (e.g., drainage channels, retaining walls) in the Refinery. The Refinery has trained personnel onsite at all times in the event a spill was to occur.
- All drums and containers are labeled and closed/secured with lids.
- Vehicle maintenance supplies, drums, and equipment are maintained in an enclosed shelter or on a raised spill containment area.
- Secondary containment for chemical storage and waste paint storage has been provided. The main chemical warehouse at the facility is indoors in a designated building.
- Security measures are implemented throughout the plant including fencing, manned entrances, and locking of fuel pumps and valves. Only trained operations personnel are allowed to open/close valves at the Refinery. Storm water movement out of the diked areas is controlled by valves that are normally closed.
- Discharge prevention measures consist of written procedures for fuel loading and unloading, regular facility inspections, and deadman switches and valves on the fuel transfer pump stations. High and low level alarms are installed on the fuel tanks to prevent overfilling or running the pumps dry during fuel delivery and dispensing operations.
- Bulk storage tanks and containers at the facility have secondary containment structures of earthen and concrete berms to contain the entire capacity of the largest single tank and sufficient freeboard.

7.2.1.2 Management of Runoff

- The Refinery's drainage system is engineered such that undiked areas flow to ponds and catchment basins, not subject to periodic flooding. These ponds and catchment basins (diked areas) are designed to retain storm water and spill material.
- Drainage from diked storage areas is managed by manually operated valves which are normally kept closed. Drainage from secondary containment storm drain or

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conveyance only occurs after being monitored for signs of contamination (sheen, discoloration, etc.).

- The Refinery is designed such that storm water, wastewater, and spill material does not discharge from the site without being treated in the WWTP or cleaned up by vacuum truck or some other means of response (emergency response team).
- Berms and surface structures have been located to limit uncontrolled movement of storm water runoff.

7.2.1.3 *Sediment and Erosion Control*

Construction or soil movement activities that occur (primarily in Storm Water Management Areas 2-5) will require the implementation of activity-specific erosion prevention and/or sediment control.

7.2.1.4 *Spill Prevention Response*

- Storm Water Diversion – Culverts, drainage ditches, and berms are in place to manage storm water on site and to prevent storm water from migrating offsite. Suncor uses storm water covers for the sewers in the Refinery process areas to allow for controlled drainage. Controlling the volume of water entering the sewer system during a storm reduces the potential for overwhelming the wastewater treatment process, both hydraulically and chemically. The Operations Department uses a written procedure to direct personnel how and when to use the storm water covers in preparation for high-flow events.
- The Refinery maintains a Spill Prevention, Control, and Countermeasure Plan for oil filled equipment, containers, and vessels as a means to prevent spills from reaching navigable waters of the United States.

7.2.1.5 *Area-specific BMPs – Plant 1*

- Oil Storage Tank Secondary Containment
 - Flows outside of dikes are routed to areas or structures designed to retain emergency runoff of spill or storm water flows; and
 - Drainage from diked storage areas within Plant 1 can be managed by manually operated valves, which are normally kept closed. Spill material may be sent to designated detention areas (i.e., Finger Lake Storm Water Basin) and treated at the Plant 1 WWTP. ERT response would be activated prior to release to the WWTP.
- Process Units
 - Curbing is in place around some of the process unit areas; and
 - A spill would be directed to process drains/storm drains or flow to drainage detention areas, but remain on-site until cleanup occurred.
- Loading Transfer Areas
 - Plant 1 loading transfer areas contain a combination of French drains and storm drains, which flow to the Plant 1 WWTP; and
 - A spill would be directed to these drains or flow to drainage detention areas on-site.
- Tertiary Containment
 - Curbing, diking, and the Burlington Ditch concrete retaining wall direct flow to collection areas in Plant 1, preventing flow off the property;

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- The Burlington Ditch concrete retaining wall is located at the southwest edge of the Plant 1 and runs northerly along the western property line adjacent to Burlington Ditch;
- Plant 1 drainage can flow westward toward the Burlington Ditch and accumulate in two collecting ponds (Finger Lake and Webber's Pond), which offer containment volumes that exceed that needed for Plant 1 associated with drainage out of inadequate secondary containments plus stormwater from areas not otherwise contained;
- Two V-notch cement conveyances (one northwest of the WWTP and one at the south end of the Refinery, west of the United Rentals building) direct storm water and spill runoff to the two collecting ponds. Material may also collect northward toward the abandoned channel of Sand Creek within the swale area. Storm water or spill material collected in this area will not discharge to Sand Creek due to the construction of the slurry wall along the perimeter of Sand Creek. Most surface water flow may also collect at the constructed detention swale and basin adjacent to Sand Creek;
- Other drainage structures utilized to control storm runoff and spill flows are the fire training ground concrete drainage channel (which runs adjacent to 60th Avenue and drains into Finger Lake Storm Water Basin), and the south tank farm concrete drainage channel (located along the Plant 1 southeastern boundary adjacent to tanks T-71 and T-75). The south tank farm channel also receives runoff from the adjacent Suncor facility housing the Commerce City Products Terminal (a products loading rack); and
- Groundwater is continuously pumped out of the area of the swale into the groundwater treatment system. The groundwater treatment system, located north of 60th avenue, is equipped with diking, curbing, and containment isolation valves. Spill material can be contained and transferred to the main refinery WWTP via vacuum trucks for treatment or processed through the groundwater treatment system, if groundwater contamination is present.
- Surface water flows originating in SWA-1 are detained behind soil berms that generally run along the facility fenceline, up-gradient of the Sand Creek riparian area, and the aforementioned detention swale and collection basin. This system of berms is designed to detain spills and smaller storm water flows, providing limited sediment control.
- An asphalt lined swale along the property boundary west of the Suncor Mechanical Shop (SMS) directs stormwater flow in SWA-2 through a culvert and into the detention area located in SWA-1.

7.2.1.6 Area-specific BMPs – Plant 3

- Oil Storage Tank Secondary Containment
 - Flows outside of dikes are routed to areas or structures designed to retain emergency runoff of spill or storm water flows; and
 - Drainage from diked storage areas within Plant 3 can be managed by manually operated valves, which are normally kept closed. Spill material may be sent to designated detention areas and treated at the Plant 1 WWTP. Emergency Response Team procedures would be activated prior to release to the WWTP.
- Process Units:
 - Curbing is in place around some of the process unit areas. Storm water and spills in the process area are restrained using curbs and walls and would be

transported to the Plant 3 storm water basin (Mary's Pond) through the sewer system; and

- A spill would be directed to process drains/storm drains or flow to drainage detention areas, but remain on-site until cleanup occurred.
- Loading Areas
 - Plant 3 loading transfer areas contain a series of storm drains, which drain to Mary's Pond; and
 - A spill would be directed to these drains through the use of swales, berms, and sloping surfaces or flow to drainage detention areas, but remain on-site until cleanup occurred.
- Tertiary Containment:
 - An East Perimeter Concrete Drainage Channel has been installed in Plant 3 to prevent discharge off site into Sand Creek;
 - Spill material and storm water outside of oil storage tank secondary containment would flow northeast along the East Perimeter Concrete Drainage Channel and be collected at Mary's Pond, where it may be discharged to Sand Creek via Outfall 004A, or pumped to the Plant 1 WWTP. Flow from Mary's Pond would be directed via manually operated pumps. Typically, water detained in Mary's Pond is pumped to Plant 1 WWTP using two permanently mounted lift pumps located in the basin. Two permanently installed lift pumps are also located in the process sewer system downstream of oil/water separation. These pumps transfer water from Plant 3 to the Plant 1 WWTP. There are containment structures to prevent water from reaching Sand Creek.
 - Runoff and surface water flow from the Plant 3 Tank farm, SWA-6 and SWA-10 is directed via curbing, diking, and natural surface water flow to the drainage channel and Mary's Pond. Flow is restricted from moving off of the property.
 - A preventative maintenance program was initiated in 2011 to provide periodic inspection and clean-out of soil and other debris present in the East Perimeter Concrete Drainage Channel. This activity is intended to ensure efficient conveyance of precipitation water into Mary's Pond.

7.2.1.7 Area-specific BMPs – Plant 2

- Oil Storage Tank Secondary Containment
 - Flows outside of dikes are routed to areas or structures designed to retain emergency runoff of spill or storm water flows.
 - Drainage from diked storage areas within Plant 2 can be managed by manually operated valves, which are normally kept closed. Spill material may be sent to designated detention areas and treated at the Plant 1 WWTP. ERT response would be activated prior to release to the WWTP.
- Process Units
 - Storm water and process wastewaters (non-segregated system) at Plant 2 are directed through piping toward two lift stations (Upper API Lift Station and Middle API Lift Station). From the lift stations, water is pumped to TK-29 (settling tank) prior to being transferred for treatment at Plant 1 WWTP. There is an out-of-service wastewater treatment system within Plant 2 near the South Tank Farm.

- Curbing is in place around some of the process unit areas. Storm water and spills in the process area are restrained using curbs and walls and would be transported to the WWTP through the sewer system.
- A spill would be directed to process drains/storm drains or flow to drainage detention areas, but remain on-site until cleanup occurred.
- Loading and Unloading Transfer Areas
 - Plant 2 loading and unloading transfer areas contain a series of storm drains, which drain to the Plant 1 WWTP; and
 - A spill would be directed to these drains through the use of swales, berms, and sloping surfaces or flow to drainage detention areas, but remain on-site.
- Tertiary Containment
 - A containment wall on the west side of Plant 2 is maintained to manage and contain storm water or spill material.
 - Drainage channels have been designed to manage and move surface flow to designated detention areas, where storm water or spills can be safely managed.
 - Storm water or spill material from Plant 2 may flow north to the retention pond at the north end of the property. The storm water or spill material is then normally transferred to the Plant 1 WWTP. In the event that storm water is discharged from this pond directly to Sand Creek, the discharge point is Outfall 024A.
 - Crude unloading dock facilities are located on a concrete slab. The system consists of an unloading rack, pumps and piping, and a crude oil/water settler. During container loading and unloading activities, personnel are required to continuously supervise the transfer. In the event of a spill, liquid on the slab will drain to a 15,000-gallon underground storage tank, the contents of which are pumped to the Refinery for product recovery.
 - Storm water or spill material from the Plant 2 South Tank Farm is contained within the bermed area surrounding the South Tank Farm. Any spill material that remains in the individual bermed areas is removed through manual valves or using a vacuum truck and transported to the WWTP. Uncontaminated storm water from the East Tank Farm may be contained within the perimeter berms on Refinery property and drained to off-property conveyance using manual/portable pumps (Outfall 027A).
 - The conveyance channels utilized may be swales located on railroad right-of-way. These channels flow north into Sand Creek. Erosion must be prevented during such pumping operations via regulation of discharge flow rate, or via armoring of the discharge impact area. Any water discharged under this storm water permit must be visually inspected for signs of contamination prior to commencement of offsite flow.
 - Storm water or spill material at Parcel II is directed into one of two detention basins. Storm water at Parcels II and IV generally infiltrate the soil or evaporate. In the unlikely event that the detention basins would be filled, water exiting would flow south and southwest into an unnamed tributary to the South Platte (Outfall 028A). This tributary parallels the railroad corridor to the west, entering the South Platte approximately 700' downstream of the York Street Bridge.
 - In the event of a spill on either parcel, the spill material would be removed from the detention basins or soil using a vacuum truck and transported to the WWTP.

- 6-inch HDPE overflow piping into Number 2 Detention pond is designed to prevent over-topping of Number 1 Detention Pond.

7.2.2 Structural Controls Specifications

Structural controls must be adequately installed and maintained as listed in the following sections.

7.2.2.1 Barrier Walls and Curbing

Barrier walls shall be constructed of concrete or asphalt and extend the entire length of the area requiring the control as shown in Drawing 005-CV-D-003.

7.2.2.2 Earthen Berms

Earthen berms shall extend the entire length of the area requiring the control as shown in Drawing 005-CV-D-003. Berms shall be maintained to approximately the same height over the entire length to prevent potential overflow of stormwater in a low spot.

7.2.2.3 Oil Containment Booms

Oil containment booms are 4" to 8" in diameter and deployed across the entire length of the area shown in Drawing 005-CV-D-003. Booms are designed to absorb oil and shall be replaced when found to be contaminated with oil or otherwise physically degraded.

7.3 Employee Training

Annual SWMP-specific training is required under Part I.B.2.h of the permit. The goal of the SWMP training program is to teach personnel, at all levels of responsibility, the components and objectives of the SWMP and to create overall sensitivity to storm water pollution prevention concerns. The employee training program includes such topics as the site-specific control measures to achieve the effluent limits, components and goals of the SWMP, monitoring and inspection procedures, and other applicable requirements of the permit. The following table (Table 8) defines the employee training program for the Refinery. At a minimum, the following individuals are trained:

- i) Employee(s) overseeing implementation of, revising, and amending the SWMP.
- ii) Employee(s) performing installation, inspection, maintenance, and repair of control measures.
- iii) Employee(s) who work in areas of industrial activity subject to this permit.
- iv) Employee(s) who conduct stormwater discharge monitoring required by Part.I.B and Part.I.C of this permit.

Table 8. Employee Training Program

Training Topics	Training Description	Schedule or Frequency	Target Attendees (Dept. or Position)
Spill Prevention Response	Environmental and Safety Issues (computer-based training (CBT), work-group specific, or general classroom format)	Annual	All Refinery employees
Spill Prevention Response	Application of procedures for spill prevention, emergency response, and spill mitigation (On-the-job training (OJT), emergency	Periodic	All Refinery employees

Training Topics	Training Description	Schedule or Frequency	Target Attendees (Dept. or Position)
	response training, and in periodic safety meetings)		
Spill Prevention Response	HAZWOPER proficiency training	As necessary	Environmental personnel, emergency response team members, vacuum truck operators
Management of Runoff	Storm water management and related issues (part of required annual training)	Annual	All Refinery employees
Good Housekeeping	OJT for site-specific instruction on actual units, duties, and functions	Ongoing	Employees who handle materials
Good Housekeeping	At least three days of site-specific training	As necessary	Each new permanent employee in Refinery operations

8.0 SPECIAL REQUIREMENTS (EPCRA SECTION 313 REPORTING FACILITIES)

In addition to the best management practices identified in this plan, facilities may be subject to additional “special” requirements, as defined in the facility’s permit. In particular, the EPA’s general permit includes special requirements for: (A) facilities that discharge storm water through municipal separate storm sewer systems; (B) facilities subject to EPCRA, Section 313, reporting requirements; and (C) facilities with salt storage piles. The following section (Section 8.1.1) identifies special requirements applicable to this Refinery, and provides additional information to address these conditions or criteria.

8.1 Discharges through Municipal Separate Storm Sewer Systems

Industrial facilities that discharge storm water through a large or medium municipal separate storm sewer system (serving a population of 100,000 or more) must comply with any applicable conditions established by the municipality’s storm water management program. Examples of conditions could include additional monitoring requirements and/or additional source control requirements.

THIS REQUIREMENT DOES NOT APPLY TO THE SUNCOR ENERGY COMMERCE CITY REFINERY

8.2 EPCRA, Section 313, Reporting Facilities

EPCRA, Section 313, Facility Spill Prevention And Response Requirements; When a leak or spill of a Section 313 water priority chemical has occurred, the contaminated soil, material, or debris must be removed promptly and disposed of in accordance with Federal, State, and local requirements and as described in the Storm Water Management Plan. These facilities are also required to designate a person responsible for spill prevention, response, and reporting procedures. The following specific control requirements must be practiced in areas where Section 313 water priority chemicals are stored, handled, processed, or transferred:

- Provide containment, drainage control, and/or diversionary structures (prevent or minimize runoff by installing curbing, culverting, gutters, sewers, or other controls, and/or prevent or minimize exposure by covering storage piles).
- Prevent discharges from liquid storage areas (store liquid materials in compatible storage containers and/or provide secondary containment designed to hold the volume of the largest storage tank plus precipitation).
- Prevent discharges from material storage areas (install drainage and/or other control measures).

- Prevent discharges from loading/unloading areas (use drip pans and/or implement a strong spill contingency and integrity testing plan).
- Prevent discharges from handling/processing/transferring areas (use covers, guards, overhangs, door skirts and/or conduct visual inspections or leak tests for overhead piping).
- Prevent discharges from all the above areas (use manually activated valves with drainage controls in all areas, and/or equip the plant with a drainage system to return spilled material to the facility).
- Introduce facility security programs to prevent spills (use fencing, lighting, traffic control, and/or secure equipment and buildings).

8.2.1 **Salt Storage Piles**

Salt storage piles used for deicing or other commercial purposes must be enclosed or covered to prevent exposure to storm water (except when salt is being added or removed from the pile). Please note that piles do not need to be enclosed or covered where storm water is not discharged to waters of the United States. Compliance with this requirement must be met as expeditiously as practicable, but no later than 3 years after the NOI is submitted.

THIS REQUIREMENT DOES NOT CURRENTLY APPLY TO THE SUNCOR ENERGY COMMERCE CITY REFINERY

9.0 **STORMWATER SAMPLING PLAN**

9.1 **Introduction**

This plan provides details for stormwater sampling required under CDPS Permit No. COS000009.

9.2 **Sampling Locations**

The following stormwater discharge outfalls identified in the permit require sampling. Drawing 005-CV-D-004 shows the locations of the permitted.

Outfall	Description
004A	Outfall associated with Mary's Lake in Plant 3
021A	Constructed outlet at the northeast corner of the Nelson Property
022A	Outlet of retention pond located at the northwest corner of Nelson Property
023A	Outfall from detention area located at west end of swale south of Sand Creek
024A	Outfall from detention area located at north end of Plant 2
025A	High flow discharge point at Plant 1 sulfur rail loading gate
026A	High flow discharge point at ditch inlet to Mary's Pond in Plant 3
027A	Manual pumping of accumulated stormwater from East Tank Farm in Plant 2
028A	Outlet of retention pond located in the southwest corner of Plant 2, south of 56 th .

9.3 **Sampling Responsibilities**

Stormwater sampling will typically be performed by the Environmental Group or designated contractors. On weekends, holidays, and after hours, sampling may be performed by Operations personnel, as follows:

- OMD 2 – Outfalls 021A, 022A, 024A, 027A, 028A
- Plant 1 – Outfall 025A
- Plant 3 – Outfalls 004A, 026A
- Wastewater – Outfall 023A

All individuals designated as potential stormwater samplers must be trained on the contents of this plan and general sampling procedures.

9.4 Sampling Frequency and Parameters

Requirements for sampling frequency and sampling parameters vary between outfalls as noted on the following table.

Frequency	Outfalls	Parameters
Monthly	023A, 024A, 025A, 026A, 028A	O&G, TOC, Se, pH, Benzene, MTBE
Quarterly	All outfalls	Visual Monitoring
Twice per discharge	004A, 027A	O&G, TOC, Se, pH, Benzene, MTBE

Sampling is only required when there is a storm event resulting in an actual discharge and when sampling has not already occurred during the period. During a storm event or when snow is melting, the person responsible for sampling will check the outfalls for stormwater discharge. The attached Stormwater Sampling Schedule will be used to track sampling events at each outfall to eliminate duplicate sampling. Sampling must be performed within 30 minutes of the start of discharge, if possible. During most storm events, discharge is only expected to occur at outfalls 021A (Nelson Property) and/or 024A (Plant 2). Outfalls 004A and 027A are manually controlled and do not normally discharge during a storm event. The remaining outfalls (022A, 023A, 025A, 026A, and 028A) are only expected to have stormwater discharge during very large or sustained storm events.

9.5 Sampling

All outfalls with the exception of 021A and 022A require sampling of stormwater for Oil and Grease (O&G), Total Organic Carbon (TOC), Selenium, pH, Benzene, and MTBE. Sample container requirements are listed in the following table. Sample kits will be made available to all groups potentially involved with sampling.

Parameter	Sample Containers	Preservative
O&G and pH	1 x 1 L clear glass	Sulfuric acid (after measuring pH)
TOC	1 x 250 mL amber glass	Sulfuric acid
Selenium (PD)	1 x 500 mL plastic	Nitric acid
Benzene and MTBE	3 x 40 mL VOA vials	Hydrochloric acid

Samples shall be immediately brought to the Lab upon sampling. Analysis for pH and Oil and Grease will be performed in the Lab. The pH analysis must be performed as soon as possible, as there is no holding time allowed for this parameter. All parameters other than pH and Oil and Grease will be analyzed by Test America. A Test America chain of custody form must be filled out and accompany the samples during shipment. In addition, the sampler must document the sampling event using a Stormwater Sampling Form. Shipping of the samples to Test America will be performed by Laboratory personnel.


9.6 Visual Monitoring

Visual monitoring of a stormwater sample must be performed at each outfall at least once per quarter. Visual monitoring will be performed by obtaining a sample of stormwater in a clear glass sample jar. The sample will be visually assessed for signs of contamination. The visual assessment must be performed in a well-lit area and will therefore typically be performed in the Lab. The assessment will be documented using a Stormwater Visual Monitoring Form, attached.

10.0 PLAN SIGNATURE AND REVIEW

All reports and other information required by the Division, shall be signed and certified for accuracy by the permittee in accord with the following criteria:

- i) In the case of corporations, by a responsible corporate officer. For purposes of this section, the responsible corporate officer is responsible for the overall operation of the facility from which the discharge described in the form originates;
- ii) In the case of a partnership, by a general partner;
- iii) In the case of a sole proprietorship, by the proprietor;
- iv) In the case of a municipal, state, or other public facility, by either a principal executive officer, or ranking elected official. For purposes of this section, a principal executive officer has responsibility for the overall operation of the facility from which the discharge originates;
- v) By a duly authorized representative of a person described above, only if:
 - 1) The authorization is made in writing by a person described in i, ii, iii, or iv above;
 - 2) The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position); and,
 - 3) The written authorization is submitted to the Division.

Plan Certification	
I hereby certify that this Storm Water Management Plan has been prepared, and to the best of my knowledge, in accordance with good engineering practices. I have personally examined and am familiar with the information submitted in this document and that based on my inquiry of those individuals responsible for obtaining this information, I believe that the submitted information is true, accurate and complete.	
Facility Signature Authority	
Printed Name	Wes McNeil
Title	Environmental Team Lead, Commerce City Refinery
 <hr style="border: 1px solid blue;"/> Wes McNeil (May 26, 2021 18:59 MDT)	

Appendix A

Revision History

Date of Review ¹		Will Plan Need Ammendment? ² (Yes/No)	Reviewer's Name ³	Reason for Amendment ⁴	Rev. #	Date
Full	Partial					
X		Yes	A. Congram	Plan Overhaul	1	12/31/03
	X	Yes	A. Congram	Name-change to Suncor	2	09/30/05
X		Yes	A. Congram	Update of Plan to include Valero Refinery (East Plant)	3	06/30/06
X		Yes	A. Congram	Updated per Renewed Single Plan for Entire Suncor Complex. Submitted to the Colorado Water Quality Control Division storm water Unit on April 26, 2007.	4	02/01/07
	X	Yes	A. Congram	Sewer Enhancement Engineering Study (CH2MHill - 2007) indicated potential stormwater flow offsite east of West Plant Sulfur Unit. Modified SWA-3 to include this area.	5	2/4/2008
X		Yes	A. Congram	Ongoing review and maintenance update.	6	8/16/2011
	X	Yes	A. Congram	Updated secondary containment survey for Plants 2 and 3 (East Plant + Asphalt Unit) storage tank areas per CH2MHill survey information.	7	3/8/2012
X		Yes	V. DeCianne (URS)	SPCC Review and Audit by URS Corporation personnel.	8	3/28/2012
X		Yes	E. Marler	New storm water discharge permit (COS000009).	9	2/28/2013
X		Yes	E. Marler	Change in Facility Information.	10	2/18/2014
X			Golder	Plan review and update.	11	6/1/2014
X		Yes	E. Marler	Updated to reflect improved structural controls associated with SWA-2.	12	3/2/2015
X		Yes	E. Marler	Updated to reflect new pipelines station. Tables and drainage basin descriptions also updated.	13	3/15/2016
	X	Yes	E. Marler	Revised 005-CV-D-003 to identify addn'l controls. Inserted section 7.2.2. Changed section 1.7 to Appendix A.	14	6/1/2016
X		No	E. Marler	Updated tables, moved language from some sections into more appropriate sections, and removed reference to general permit.	15	3/23/2017
X		No	E. Marler	Updated tables and contact information	16	6/14/2019
X		No	E. Marler	Updated tables and contact information	17	4/29/2020
X		No	E. Marler	Updated tables, moved signature to last section	18	4/27/2021

Notes:

1. A full review of the plan must be performed at least once each year.
2. Any addition of new sources of significant materials or a change in operations which will have a significant effect on the potential to contaminate storm water runoff from this facility will require an amendment to this plan, including a description of controls to be used to minimize exposure of such materials to storm water runoff. If amendment of the plan is required as the result of a Site Compliance Evaluation, amendment of the plan must be completed within two (2) weeks of the inspection, and implementation of any necessary changes must be completed within twelve (12) weeks of the inspection (EPA 832-R-92-006; 2.5.3).

- ³. The reviewer identified in the table above has completed review and evaluation of this plan on the date indicated and will or will not amend the plan as a result, as indicated.
- ⁴. Briefly describe reasons for plan amendment, as required in footnote 2. For administrative changes not subject to the criteria identified in footnote 2, such as updates to names or phone numbers, regulatory changes, or changes in company policies, recertification of the plan is not required.

Appendix B

Material Inventory – Potential Pollutant Sources

Material or Activity	Location	Quantity			Exposed (Yes/No/Potential)	Method of Exposure	Containment ¹	Potentially Affected Outfall and MH
		Used	Stored	Produced				
AFFF Firefighting Foam	Plant-wide	NA	6,625	NA	Yes	Only used in the event of a fire or vapor release emergency	No	Plant-wide
Crude Oil	Plant-wide	80,000–100,000 Barrels/day	≈600,000 Barrels	NA	Yes	Spills, leaks or failure of tanks/piping	Yes	SWA-1,2,3,7 & 8
Electrical Transformer Oils	Plant-wide	Estimated 5,000 gallons	NA	NA	Yes	Leak or failure of transformer	No	Plant-wide
Ethylene Glycol	Process Units	37,000 gallons annually	30,000 gallons	NA	Potential	Spill, leak, release	Yes	SWA-3
Molten sulfur	SWA-3	NA	NA	≈100 tons/day	Potential	Spill from railcar loading or loss of containment	Yes	SWA-3
Motor fuels and petroleum refining intermediate liquids	Plant-wide	Varies	Approx. 1.7 MM Barrels	Varies	Yes	Leaks, tank or piping failure, loading rack failure	Yes	All excluding Nelson Building area
Oils and greases	Employee/contractor parking area	NA	NA	NA	Potential	Spills or leaking vehicles	No	SWA-1,2,3,4,10
Paint and paint-related wastes	Maintenance facilities	Varies	Varies	NA	Potential	Spills or residues	Yes	Plant-wide
Petroleum sludges	AU bundle cleaning facilities	NA	Maximum ≈50,000 lbs.	Varies	Potential	During heat exchanger bundle cleaning and related maintenance	Yes	SWA-6,8
Wastewater treatment sludges	Plant 1 WWTS	NA	30,000 to 90,000 lbs.	≈30,000 lbs./week	Potential	Spill from container	Yes	Plant 1
Process chemicals, various	Process areas, Tank Farm areas	NA	≈0.5MM gallons	TBD	Potential	Spill	Yes	Plant-wide
Soil and Sediment	Plant-wide	NA	NA	NA	Yes	Erosion of exposed and/or disturbed soil	No	All outfalls
Sulfuric acid	Process areas	Varies	≈65,000 lbs	NA	Potential	Spill, leaks, equipment failure	No	SWA-8
Vehicle maintenance (vehicle fluids, litter)	Outside of vehicle maintenance shop	Varies	NA	NA	Potential	Spills, poor housekeeping, vehicle leaks	No	SWA-1,2,10
Waste paint	Waste paint collection	TBD	TBD	TBD	Potential	Spill or overflow	Yes	SWA-2
Water-soluble or mobile constituents	Laydown and scrap storage	NA	NA	NA	Potential	Precipitation wash-off	Yes	Plant-wide

Notes:

¹.Adequate – means sufficient secondary containment to allow for the contents of the single largest tank plus freeboard for precipitation.

Appendix C

Spill History

Date	Material Spilled/Leaked	Quantity (gallons)	Source	Location	Storm Water Exposure	Cause	Response Procedures (Amount Material Recovered)	Preventive Measures
2/18/2021	Laboratory wastewater	20-40	Laboratory process wastewater sump	Plant 1 Laboratory	Yes	Overflow of sump due to frozen line	Remove standing liquid with vacuum truck, excavation of impacted soil, and sump repair	Contents of sump kept low using vacuum truck until line could be repaired
2/9/2021	Diesel	14,700	Tanks 48 and 49	Plant 1 Tank Farm	Yes	Failure of piping component	Removed standing diesel with vacuum truck and excavated impacted soil	Repair line
6/22/2020	Wastewater treatment sludge	10-15	Frac tank	Plant 1 along property boundary with FRICO	No	Overflow of tank	Spill cleaned up and impacted soil was excavated	Frac tank emptied and moved
3/24/2020	Crude oil	7-9	Open bleeder valve	Plant 1 crude pipeline terminal	No	Open valve	Impacted soil was excavated	
11/5/2019	Diesel	40-80	Tank 3801	Plant 1 Tank Farm	Yes	Overflow of water draw sump	Removed standing water/diesel mixture by vacuum truck, followed by excavation of contaminated soil.	Sump has been emptied
5/7/2019	Wastewater treatment sludge	<40	Tanks 4517 and 4518	Wastewater Treatment System	Yes	Valves on a line between Tanks 4517 and 4518 and a frac tank were inadvertently left open. Sludge gravity flowed into the frac tank which overflowed onto the ground.	Material was picked up by vac truck.	Line between the tanks has been taken out of service.
11/16/2018	Laboratory wastewater	130-170	Lab Sump	Plant 1 Laboratory	No	Wastewater sump overflowed due to loss of power to sump pump.	Excavation of impacted soil.	Power restored to building.
5/3/2018	Diesel	360	Tank 66	Plant 1 Tank Farm	No	During transfer of diesel between tanks, a bleeder was left partially open, allowing product to leak out onto the ground.	Excavation of impacted soil and application of MicroBlaze.	Bleeder has been closed.
4/20/2018	DGF Float (hazardous waste)	>2	Tank 4508	Wastewater Treatment Plant	No	During transfer sludge from using vac truck, truck operator inadvertently blocked in a valve causing the transfer line to over pressure and rupture	Excavation of impacted soil and application of MicroBlaze.	The ruptured line was repaired.
3/6/2018	Reformate	Unknown	Tank 44	Plant 2 Tank Farm	No	Leak from bottom tank seam onto soil.	Excavation of impacted soil and application of MicroBlaze.	Tank was emptied to allow for repair.
3/6/2018	Reformate	Unknown	Tank 70	Plant 1 Tank Farm	No	Overfilling of sump resulting from leaking valve from tank.	Sump was emptied and excavation of impacted soil and application of MicroBlaze.	Valve was repaired.
1/22/2018	Naphtha	Unknown	Tank 1	Plant 1 Tank Farm	No	Leaking valve sprayed naphtha on mix line through the bonnet at T-1.	Valve was blocked in and containment placed underneath. Excavation of impacted soil and application of MicroBlaze.	The valve was drill and pumped to stop the leak
12/28/2017	Reformate	~40	Tank 47	Plant 2 Tank Farm	No	Product got on tank roof during transfer of contents between two tanks.	Excavation of impacted soil and application of MicroBlaze.	
11/7/2017	Diesel and Water Mixture	~130	Vac Pad	Wastewater Treatment System	No	During offloading of a vacuum truck to the WWTS headworks, a hose connection came loose resulting in a release to a concrete containment area. Some of the material overflowed the containment onto the surrounding soil.	Standing liquid removed by vacuum truck and excavation of impacted soil.	
4/23/2017	Diesel	80-130	Tank 72	Plant 1 Tank Farm	No	A temporary hose developed a leak due to being over pressured as a result of a valve that was incorrectly blocked in.	Standing liquid removed by vacuum truck and excavation of impacted soil.	Issue with blocked line was remedied.
11/5/2016	Reformate	130-170	Tank 75	Plant 1 Tank Farm	No	Investigation of incident indicates reformate may have gotten onto tank roof during #1 Reformer startup and then drained onto ground via roof drain.	Excavation of impacted soil.	
7/6/2016	Hydrocarbon	Unknown	Subsurface	Plant 1 Sewer	No	Unearthed historical contamination during excavation around process drain	Removed product from excavation and drain	Monitoring wells used to actively monitor area.
3/9/2016	Clarified Slurry Oil Sludge (hazardous waste)	45	Tank 57/59	Plant 1 south of Tanks 57 and 59	No	Overfilled frac tank with sludge pumped from Tanks 57 and 59	Spill was immediately cleaned up	Reviewed and revised frac tank management practices
9/29/15	Gasoline	100-150	Tank 96	Plant 1 Tank Farm	No	Leaking valve	Excavation of impacted soil	Leaking valve was taken out of service.

Appendix C

Spill History

Date	Material Spilled/Leaked	Quantity (gallons)	Source	Location	Storm Water Exposure	Cause	Response Procedures (Amount Material Recovered)	Preventive Measures
12/27/15	Jet Fuel/Naphtha	6,000-8,000	Tank 777	Plant 1 Tank Farm (within bermed area)	Yes	Leaking flat cap on pipe	Standing liquid removed by vacuum truck and excavation of impacted soil.	Leaking pipe was taken out of service and repaired.
7/20/14	Slop/Waste Oil	40-50	Plant 1 slop oil pipe	Plant 1 process Area	No	Leaking pipe	Excavation of impacted soil	Leaking pipe was repaired.
4/3/13	Gasoline	100-200	Tank 55	Plant 1 Tank Farm (within bermed area)	No	Leaking pipe	Standing liquid removed by vacuum truck and excavation of impacted soil.	Leaking pipe was repaired.
3/27/13	Kerosene/Naphtha	200-400	Tank 777	Plant 1 Tank Farm (within bermed area), SWA-1	No	Leaking valve	Excavation of impacted soil and treatment of area with Micro-Blaze	Leaking valve was repaired.
2/28/12	Naphtha	~80	Tank 777	Plant 1 Tank Farm (within bermed area), SWA-1	No	Leaking valve	Excavation of impacted soil and treatment of area with Micro-Blaze	Leaking valve was repaired.
11/28/11	Waste Oil	Unknown	Subsurface	SWA-1, SWA-2 and downstream Sand Creek Areas	Yes	Part of ongoing remediation response and investigation	Ongoing remedial activities in conjunction with EPA and CDPHE consultations.	Ongoing remedial activities in conjunction with EPA and CDPHE consultations.
8/22/11	Waste Oil	5	Subsurface historical oil contamination	Directly adjacent to Sand Creek – discharging to creek near the existing WWT outfall pipe	Yes	Movement of historical groundwater oil contamination adjacent to slurry wall.	Containment & sorbent booms were deployed directly downstream of the sheen release point. A vacuum truck is stationed at the collection point. In addition, dual booms were deployed downstream to provide contingency containment.	Long-term groundwater remediation project
7/7/11	Waste Oil	30	Active groundwater remediation area	SWA-1, Sand Creek Area	Yes	Flash flood on sand creek which inundated the adjacent property undergoing remediation.	Straw bales placed to help prevent reoccurrence in the event of future flash flooding. In addition, microblaze bioremediation product is being applied to stained vegetation (no material applied to shoreline or water.)	Added straw bales to help avert loss of oil during over-topping. Additional surface oil removal from on-site pond (associated with ongoing remediation effort).
2/15/11	Waste Oil	50	Related to ongoing remediation activities and historical releases (RCRA order)	SWA-1, Sand Creek Area	Yes	Historical hydrocarbon contamination brought to surface by high groundwater elevations.	Commenced vacuum-truck removal of hydrocarbon material. Conducted area air monitoring. Mobilized oil-removal emergency response contractor. Established wildlife deterrent measures.	Initiation of investigation and control measures. Remediation issue being addressed as part of larger remediation remedy.

Appendix D

Forms

Stormwater Sampling Form

Outfall Number _____

Start of Discharge: Date _____

Time _____

Sample Taken: Date _____

Time _____

If sampling could not be performed within 30 minutes of the start of discharge, describe the circumstances:

Sample Container	Check
1 x 1 L clear glass (no preservative)	
1 x 250 mL amber glass (sulfuric acid preserved)	
1 x 500 mL plastic (nitric acid preserved)	
3 x 40 mL VOA vials (hydrochloric acid preserved)	

Depth of Stormwater Flow _____

Width of Stormwater Flow _____

Describe any observed issues that could impact stormwater quality:

Person who collected the sample:

Name _____ Signature _____

Stormwater Inspection Form

Inspection Date: _____

Time: _____

Weather Conditions:

PLANT 1	Yes	No	N/A
Is there discharge occurring from Outfall 023A (detention area along Sand Creek)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any signs of erosion of the swale or detention area along Sand Creek?			
Is there any evidence of contaminants or non-stormwater discharges along Sand Creek (other than Outfalls 002 and 003)?			
Is there discharge occurring from Outfall 025A (Sulfur Rail Loading Gate)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Is there any debris blocking the stormwater drain at the sulfur loading gate?			
Is there any evidence of contaminants or non-stormwater discharges along Brighton Blvd?			
Are there any signs of structural deficiencies with the detention area located near the North Gate?			
Is there any oil or solids present in the detention area located near the North Gate?			
Are there any structural deficiencies associated with tank berms?			
Are drain valves along north tank berm open or unlocked?			
Are drain valves at Waste Pad open?			
Are there any deficiencies or blockages associated with the ditches leading to Finger Lake?			
Are there any structural deficiencies with Finger Lake or the large detention area at the west end of the property?			
Is there any oil or solids present in Finger Lake or the large detention area at the west end of the property?			
Are there any signs of contamination, non-stormwater discharges, or leaking/improperly stored containers/equipment along Denver Metro property, the paper mill property, or Burlington Ditch?			

Stormwater Inspection Form

Inspection Date: _____

Time: _____

Weather Conditions: _____

PLANT 2	Yes	No	N/A
Is there discharge occurring from Outfall 024A (detention basin at north end of facility)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any signs of structural deficiencies associated with the detention basin?			
Is there any oil or solids present in the detention basin?			
Is the detention basin full or close to full of water?			
Is there any evidence of contaminants or non-stormwater discharges along Sand Creek?			
Are there any structural deficiencies associated with tank berms?			
Are there any signs of contamination, non-stormwater discharges, or leaking/improperly stored containers/equipment along the east or west property boundaries?			
Is there discharge occurring from Outfall 027A (East Tank Farm manual pumping of bermed area)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any signs of contamination, non-stormwater discharges, or leaking/improperly stored containers/equipment along the railroad south of the facility (south side of 56 th)?			
Are there any signs of leaks or contamination associated with rail or truck loading/unloading areas?			
Are there any structural deficiencies associated with secondary containment structures at crude unloading docks?			
Is there discharge occurring from Outfall 028A (retention pond behind South Park trailers)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Is the retention pond full or close to full of water?			

Stormwater Inspection Form

Inspection Date: _____

Time: _____

Weather Conditions:

PLANT 3	Yes	No	N/A
Is there discharge occurring from Outfall 004A (Mary's Lake)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any signs of structural deficiencies associated with Mary's Lake?			
Is there any oil or solids present in Mary's Lake?			
Is there any evidence of contaminants or non-stormwater discharges along Sand Creek?			
Is Mary's Lake full or close to full of water?			
Is there discharge occurring from Outfall 026A (Overflow of inlet into Mary's Lake)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any deficiencies or blockages associated with the east perimeter stormwater ditch?			
Are there any structural deficiencies associated with tank berms?			
Are there any signs of contamination, non-stormwater discharges, or leaking/improperly stored containers/equipment along the east or south property boundaries?			
Nelson Property	Yes	No	N/A
Is there discharge occurring from Outfall 021A (constructed outlet at northeast corner of property)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any structural deficiencies or blockages associated with the constructed outlet?			
Is there discharge occurring from Outfall 022A (outlet of retention pond located at northwest corner of property)?			
If so, are there any indications of stormwater pollution (floating material, oil sheen, discoloration, turbidity, odor, etc.)?			
Are there any structural deficiencies or blockages associated with the constructed outlet?			
Are there any signs of contamination, non-stormwater discharges, or leaking/improperly stored containers/equipment along property boundaries?			

For any questions answered 'yes', specify locations and provide detailed descriptions where deficiencies were observed (provide attachments if needed):

Recommended Corrective Actions (provide attachments if needed):

Number	Recommendation	Responsible Person	Expected Completion Date	Repeat Issue?

I certify that this report is true, accurate, and complete, to the best of my knowledge and belief.

Person who performed inspection:

Name _____

Signature _____

Team Lead - Environmental:

Name _____

Signature _____

Stormwater Sampling Schedule

Year _____

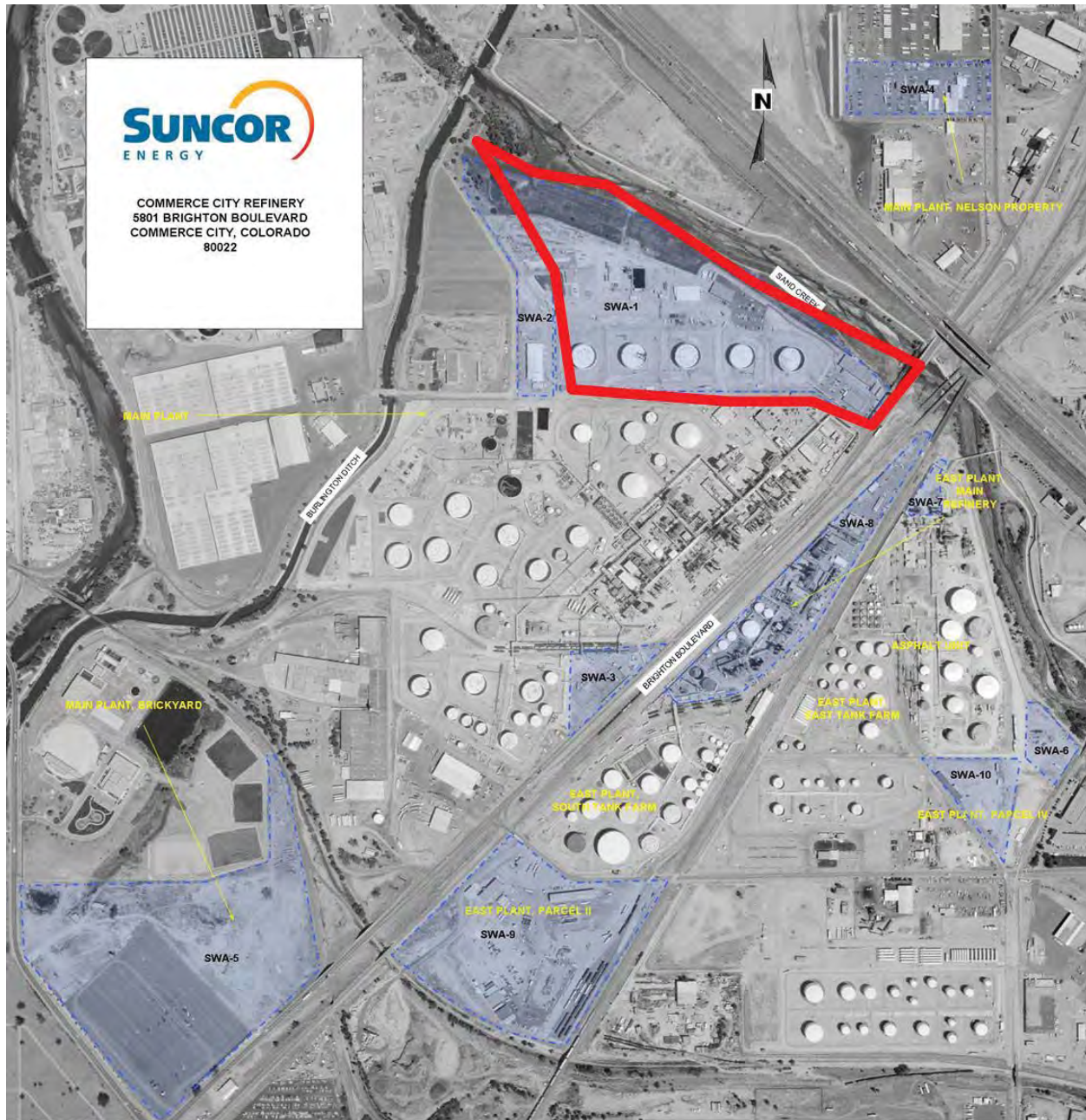
Outfall		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
004A	Sample	Sample twice per discharge											
	Visual												
021A	Sample	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Visual												
022A	Sample	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Visual												
023A	Sample												
	Visual												
024A	Sample												
	Visual												
025A	Sample												
	Visual												
026A	Sample												
	Visual												
027A	Sample	Sample twice per discharge											
	Visual												
028A	Sample												
	Visual												

Instructions

Enter the date of each sampling and visual monitoring event in the spaces above. Sampling/visual monitoring is not required at a given outfall, if it has already been performed earlier during the same period. In addition, sampling/visual monitoring should not be performed during a measurable storm event that occurs less than 72 hours after the previous measurable storm event. For outfalls 004A and 027A, which are manually controlled, sampling must be performed twice during each discharge, regardless of the number of discharges during the year.

FIGURES

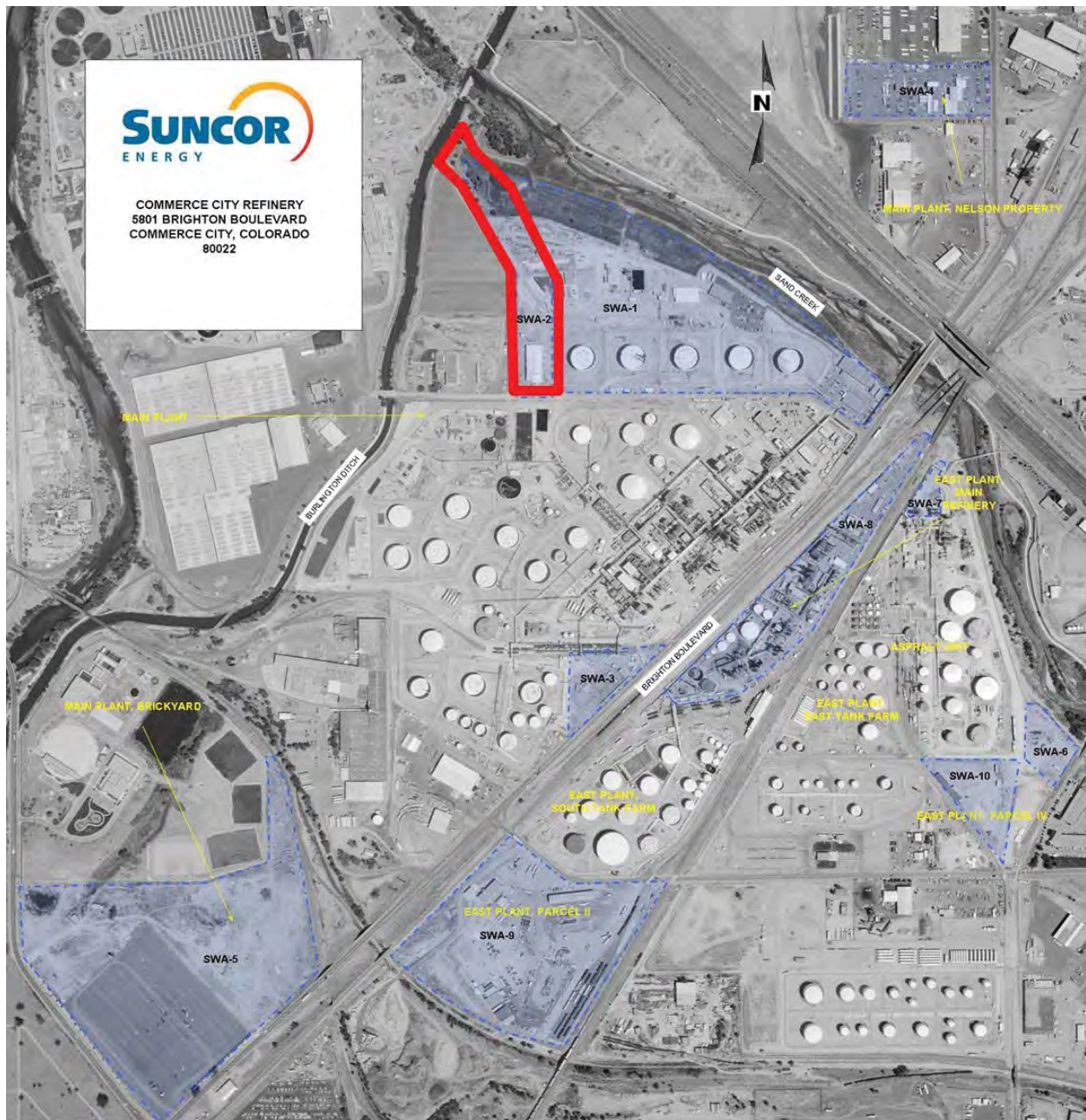
Figure 1: Storm Water Area 1 (SWA-1)



This area is adjacent to Sand Creek, north and northwest of tanks T-774, T-775, T-776, T-777, and T-778. There is a storm water detention area at the northwest corner of the Main Plant that collects run-off from areas outside diked tank storage in the north section of the plant. Under normal rainfall events, there is no outlet from this storm water detention area. In this area of the plant, the storage tanks are predominant features, with areas outside the diked containment being primarily used as a storage area for spare refinery parts and equipment. Crude truck unloading takes place south of T-776, adjacent to 60th Avenue. Also of significance in this area are facilities associated with the soil/groundwater remediation measures underway via a RCRA Order involving ConocoPhillips, and Suncor Energy (U.S.A.).

Precipitation falling on and around Tanks T-774, T-775, T-776, T-777, and T-778 is captured in the earthen dikes constructed as secondary containment, and is not a part of storm water runoff. Storm water contamination potential for this area is low to moderate.

Figure 2: Storm Water Area 2 (SWA-2)



SWA-2 borders 60th Avenue on the north, and is bordered on the west by Metro Wastewater Reclamation District and the Burlington Ditch. Activities/materials in this area that are not inside diked tank storage include surplus material storage, sandblasting, painting, and a maintenance facility (contained within a metal building).

Storm water runoff from this area travels west by sheet flow to a ditch just west of the western property boundary. This ditch flows north along the fence line until reaching a point where the water travels through a buried culvert back onto Suncor Energy (U.S.A.) property. A detention area receives this flow and other flows from SWA-1. During normal rainfall events, there is no outlet from this storm water detention area. If there is significant quantity of runoff to overtop this detention area, sheet flow will occur over the existing roadway toward the north, and to Sand Creek. Considerable infiltration occurs in the detention pond area – the runoff potential and potential for storm water contamination is very low. The facility's discharge permit does allow for discharge of this storm water if water quality is acceptable.




SUNCOR
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△	2014-08-18	ISSUED FOR CLIENT REVIEW	LRS	LRS	KP	PP
REV	DATE	REVISION DESCRIPTION	DES	CADD	CHK	RWW
PROJECT		SUNCOR SPCC PLAN COMMERCE CITY, CO				
TITLE		STORM WATER AREA 3				
PROJECT No. 130-1742			FILE No. 1301742A0043			
					SCALE NOT TO SCALE DRAWING SWA-3	

Figure 4: Storm Water Area 4 (SWA-4)

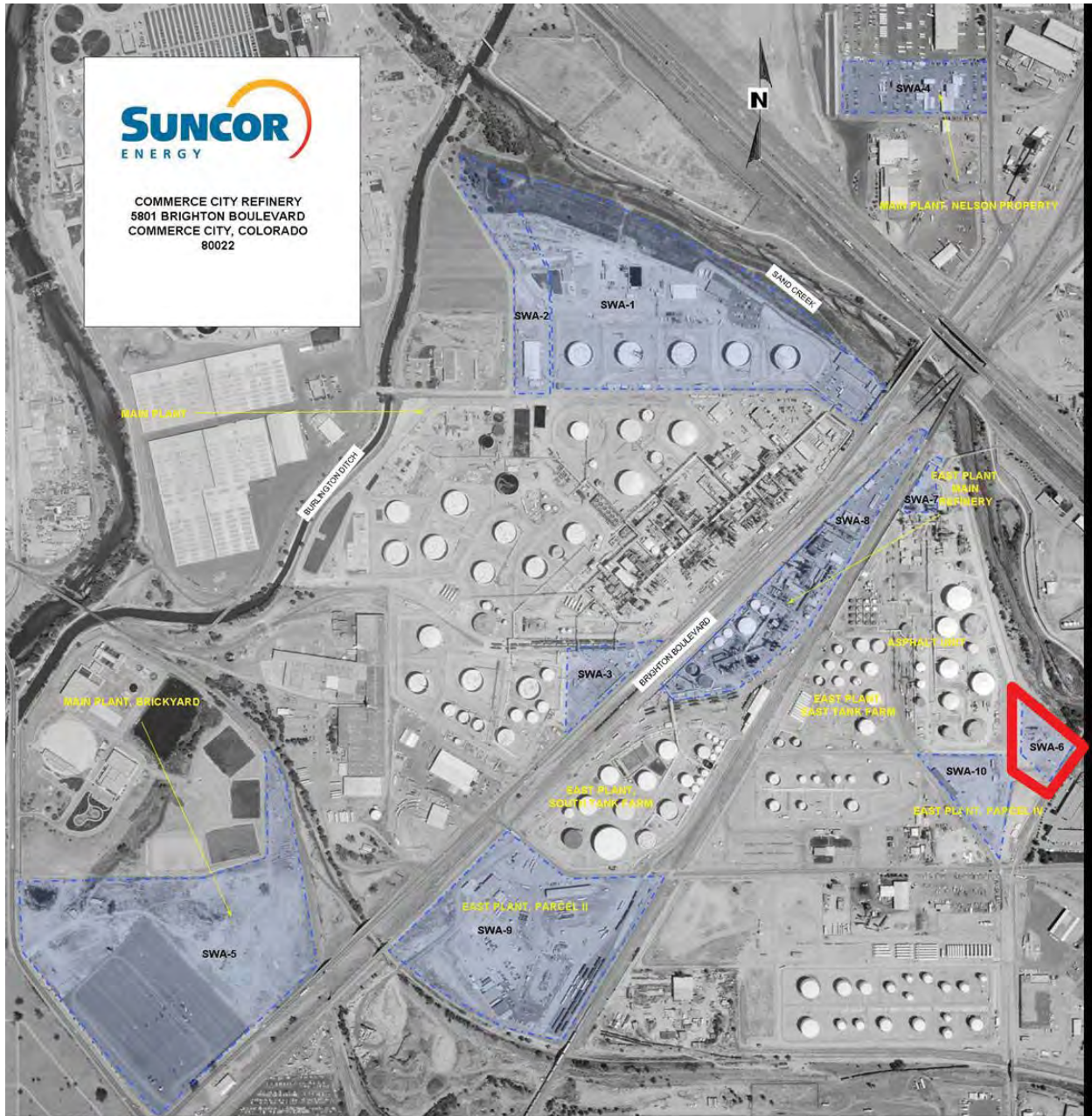


Suncor Energy owns and operates a maintenance facility, referred to as the “Nelson Property”, that is located north of the Main Plant on Brighton Boulevard. This facility includes the following features and activities:

- Fuel truck parking
- Parts laydown and storage
- A 10,000 gallon double-walled diesel storage tank (Decommissioned)
- A 6,000 gallon double-walled gasoline storage tank (Decommissioned)
- Transformer
- Truck wash building with drum storage of used oil and motor oil
- Roll-off boxes with soil, scrap and miscellaneous debris

The facility is situated primarily a soil/gravel surface with small areas of pavement. The west side of the facility slopes slightly to the west and southwest; storm water would flow as sheet flow in those directions and onto the adjacent property. The east or “front” side of the facility slopes slightly to the east and north; storm water would also exit the property as sheet flow. There are several storm drains in the center of the maintenance facility that convey storm water to the city’s storm water sewer system along Brighton Boulevard. Storm water runoff contamination potential for this area would be classified as moderate.

Figure 6: Storm Water Area 6 (SWA-6)



A small area exists in the southeast portion of the Asphalt Unit tank farm, which, although graded to minimize offsite storm water runoff, could possibly convey minimal sheet flow offsite during significant storm events. The actual area not controlled by surface structures is less than 2 acres. This area is used infrequently for staging of materials, surplus material storage, storage of temporary tanks and overflow parking during facility turnarounds/maintenance.

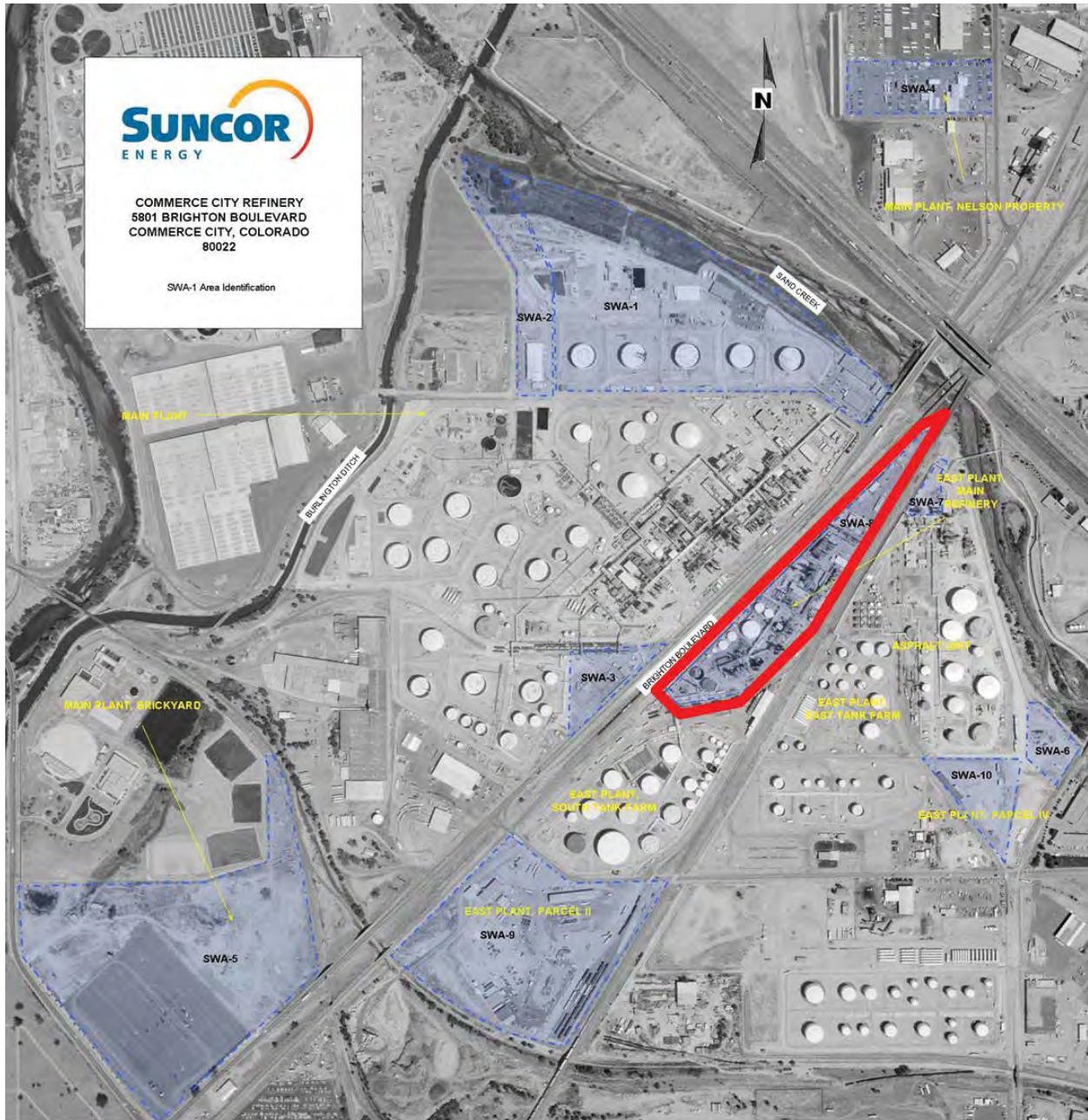
Sheet flow produced would flow east and northeast into the right-of-way adjacent to Sand Creek. This area is covered by scrub vegetation and exposed soil and has minimal slope so the potential for storm water contamination is low.

Figure 7: Storm Water Area 7 (SWA-7)



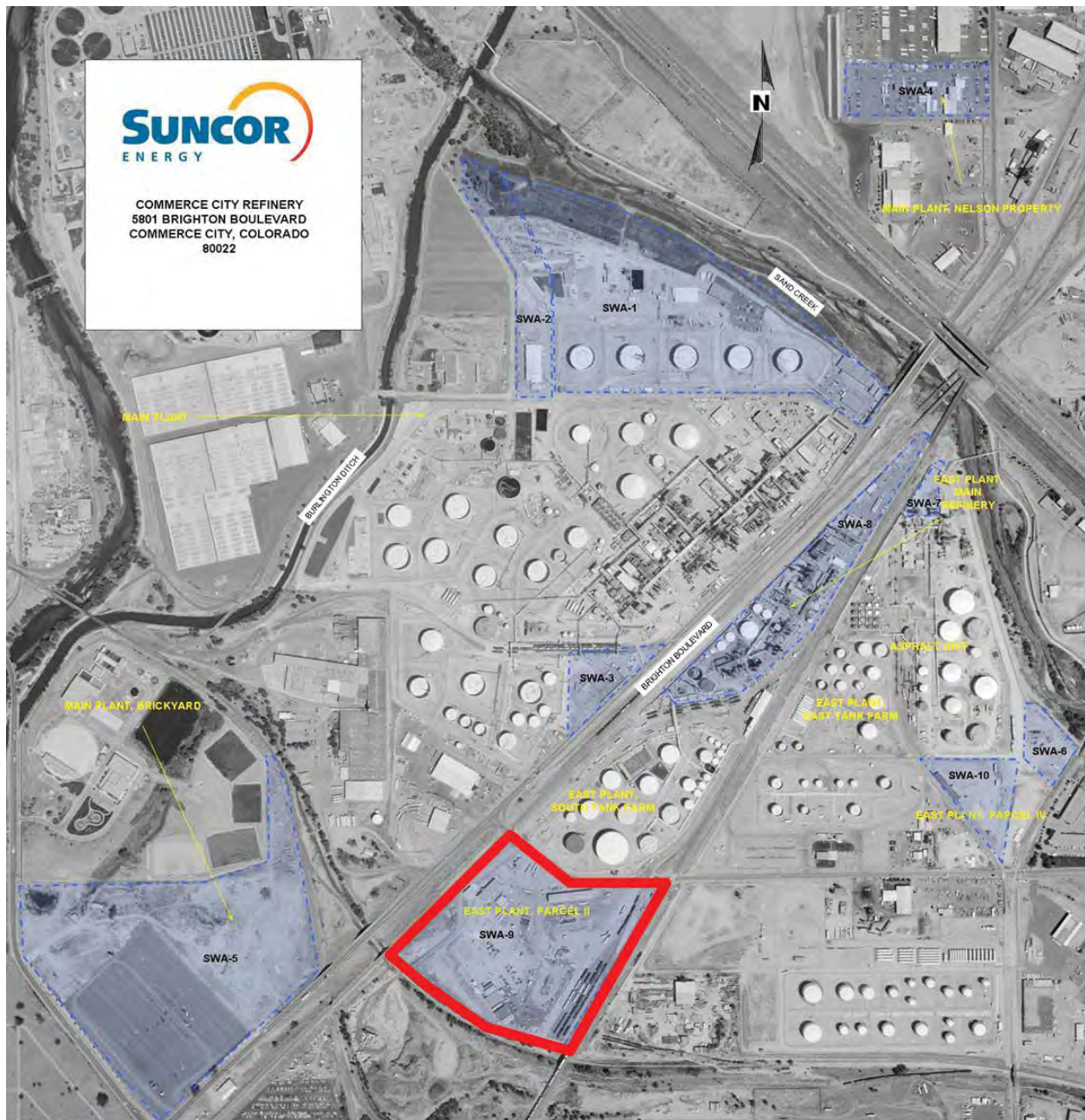
There is a small area at the northwest corner of the plant where run-off can exit the facility to the north along the north entrance road. There is a minor potential for storm water that has been exposed to process areas on the extreme north end of the plant to flow off site at this point. There is also minor potential for this flow to reach Sand Creek. The potential for storm water contamination is minimal.

Figure 8: Storm Water Area 8 (SWA-8)



Storm water not captured by refinery area drains, along with precipitation impacting the parking and office areas of the East plant will flow to the extreme north end of the East Plant to a concrete retention basin. Storm water may be detained in this basin, pumped back to wastewater treatment, or allowed to evaporate. The discharge point for this flow is adjacent to the permitted industrial wastewater discharge point identified as Outfall 001. Storm water discharge to Sand Creek will only be allowed if the storm water is of acceptable water quality. The potential for storm water contamination is moderate.

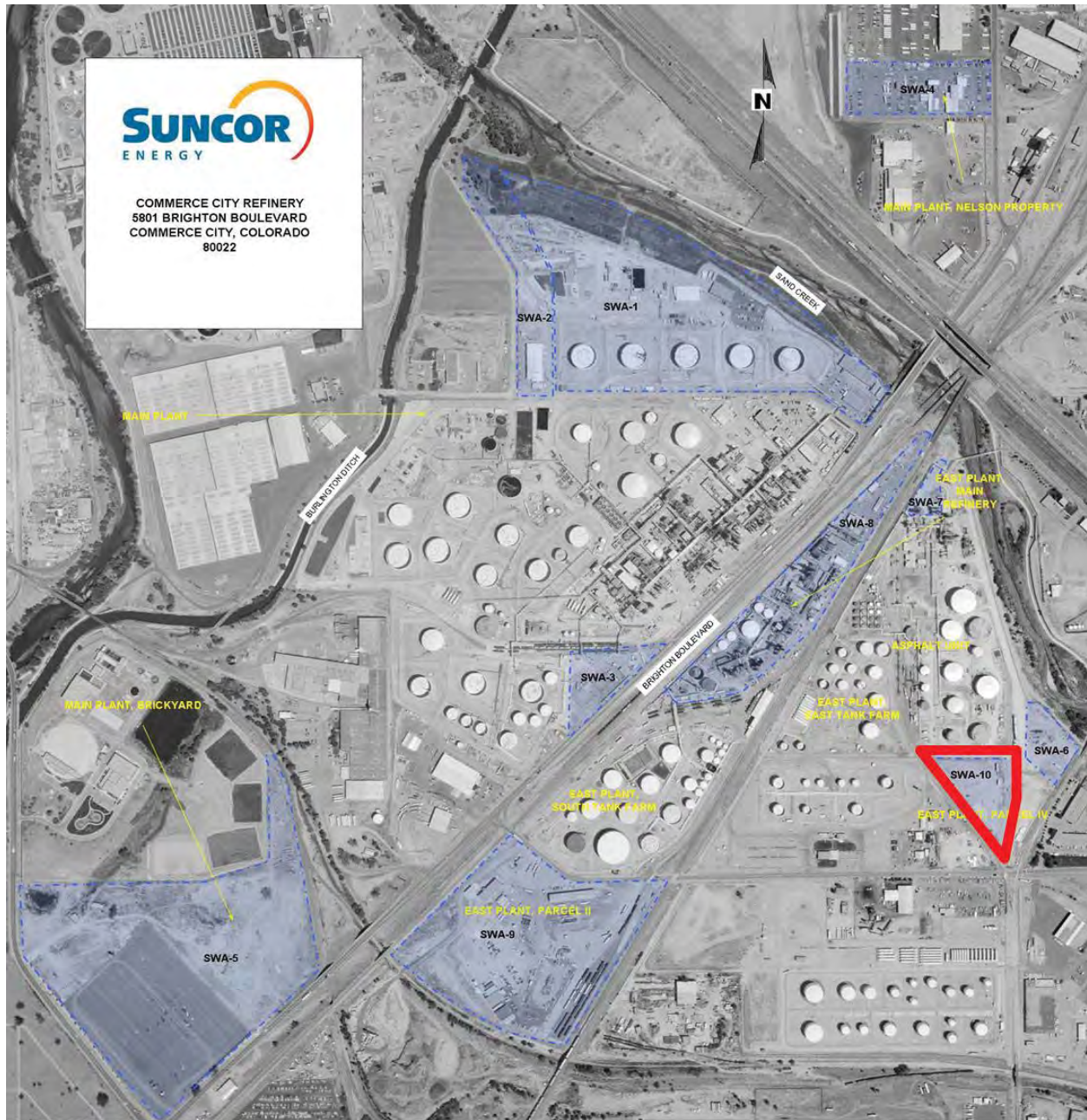
Figure 9: Storm Water Area 9 (SWA-9) - Parcel II



Parcel II is located directly south of the main refinery property across 56th Avenue. Crude oil truck unloading, LPG railcar loading and unloading, ethanol railcar unloading, gasoline and diesel fuel railcar loading, and the refinery's fire station are located on Parcel II. An independent contractor's field office, equipment storage building and outside equipment laydown areas are also located on Parcel II.

Parcel II covers approximately 16 acres – flow is generally to the south and southeast to a retention pond at the very southwest end of the parcel. This pond has no outlet. There is also a small storm water collection basin in a low area near the center of the parcel – collected water is allowed to evaporate or infiltrate. Drainage ditches, railroad ROWs and the topography direct run-off to the retention pond. The majority of runoff from Parcel II appears to infiltrate. Due to the strategic grading and routing of runoff into these basins, the potential for release of storm water contamination is low.

Figure 10: Storm Water Area 10 (SWA-10) - Parcel IV



Parcel IV is located approximately 1000 feet east of the main refinery process area, and is adjacent to the East Tank Farm (to the west) and the Asphalt Plant (to the north). Parcel IV is approximately 3 acres in size and is primarily an equipment laydown area that is essentially level. With most rainfall events, precipitation would tend to remain and infiltrate. However, a large rain event may cause flow to the north into the Suncor Asphalt Plant.

Just to the south of this laydown area is an area called the Odyssey Staging Area. It is also graded relatively flat and is used for temporary equipment storage and parking. Heavy rainfall would cause run-off to the south onto 56th Avenue. The potential for storm water contamination from both areas is minimal.