
# Water Quality Report for the E. 88th Avenue (I-76 Northbound Ramps to Highway 2) Environmental Assessment

*The intent of this guide is not to limit the data to only the items listed, but to establish a minimum requirement consistent with required water quality design and reporting procedures. If circumstances are such that a water quality feature is sized by other than normal procedures, or if the size of the feature is governed by factors other than hydrologic or hydraulic factors, a narrative summary detailing the design basis shall appear in the Water Quality Report.*

The E. 88th Avenue (I-76 Northbound Ramps to Highway 2) Environmental Assessment included 15% design. This outline includes a discussion of what should be updated for the Field Inspection Review (FIR) submittal. FIR reports should include, at a minimum, a discussion of how each item in the outline will be addressed in the Final Office Review (FOR) submittal.

## 1.0 CONTENTS

*This section should be updated in the FIR report.*

# 2.0 INTRODUCTION: DESCRIPTION OF PROJECT

*The design is pre-FIR in detail and water quality information has not been developed to a level for FIR submittal. This section should be updated in the FIR report.*

This report summarizes the water quality and water resources in the project study area. It describes the impacts of the Proposed Action on these resources, which are used for drinking, recreation, agriculture, and wildlife habitat, and the mitigation measures for those impacts.

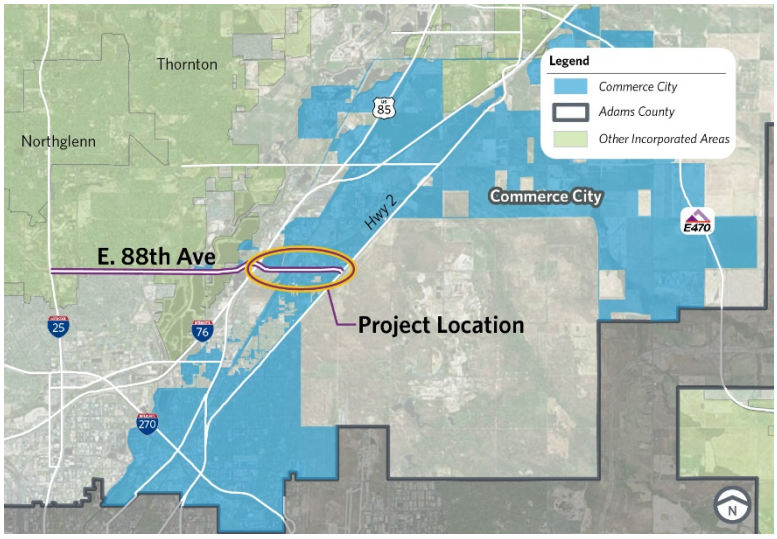
The analysis was conducted in compliance with the federal and state Clean Water Act, and the Colorado Department of Public Health and Environment's Total Maximum Daily Loads database was consulted. Additionally, all Municipal Separate Storm Sewer System and New Development and Redevelopment Program guidelines were followed.

## 2.1 Geographic Location

*Provide the name of the receiving water, the water's Water Body Identification number (per the Colorado Department of Public Health and Environment), distance to receiving water, and outfall location(s). Include a **project location map** that shows project location, project extent, state highway number, major road names, geographic reference (county/ town), north arrow, name(s) of receiving waters, locations of existing and proposed outfalls, and jurisdictional Municipal Separate Storm Sewer System boundaries. United States Geological Service quad maps can be used to determine the receiving water and the Water Body Identification number can be found via an interactive Geographic Information System map at http://cdphe.maps.arcgis.com/home/webmap/viewer.html?webmap=09478d4370d54c488530c5afff9ceed0. Colorado Department of Transportation's Municipal Separate Storm Sewer System boundary area and outfalls are in a Geographic Information System database that can be found at: http://cdot.maps.arcgis.com/home/webmap/viewer.html?webmap=3f0e1cd27e084239881dca18856400ce. This information is located under the Environmental Water Quality category which can be accessed by clicking on Content near the top of the page.*

The Proposed Action is located within the Commerce City, Colorado, United States Geological Survey quadrangle unit (2016) (Public Land Survey System: Sections 20, 21, 22, 27, 28, and 29 of Township 2 South, and Range 67 West). The western terminus coordinates of the Proposed Action are 39.85740, -104.91211 (World Geodetic System 84), and the eastern terminus coordinates are 39.85549, -104.88257 (Figure 1)

**Figure 1. E. 88th Avenue Project Location Map**




The project is located entirely within Commerce City, with no improvements proposed on Colorado Department of Transportation (CDOT)

owned right-of-way. CDOT is providing oversight because the project has received federal funds from Federal Highway Administration.

There is no existing permanent roadway water quality treatment in the project study area. On the north side of E. 88th Avenue, several commercial sites (e.g., DPI Rocky Mountain, FedEx Ground, Union Pacific Railroad, and Mile High Flea Market) have on-site detention ponds for stormwater. Four detention ponds are located within 1,200 feet of E. 88th Avenue. However, these detention ponds were designed for runoff from the adjacent commercial facilities and not for the inputs from E. 88th Avenue runoff.

There is limited existing drainage infrastructure in the project study area, with roadside ditches defined in some areas and not in others. Generally, stormwater runoff is conveyed via sheetflow within the project study area. Given the limited topographic change within the project study area (it is mostly flat), ponding of water is not uncommon. Stormwater flowing south of E. 88th Avenue drains south to intermittent roadside ditches, adjacent properties, and to the O'Brian Canal untreated. Stormwater flowing north of E. 88th Avenue drains to a 48-inch reinforced concrete pipe that leads to the detention pond on the northeast side of the Union Pacific Railroad crossing at E. 88th Avenue and Rosemary Street. The pond is discussed as a non-jurisdictional feature in the *Wetlands and Other Waters of the United States Technical Report*, located in Appendix A of the Environmental Assessment.

The major drainage basins contributing to the E. 88th Avenue drainage system are those contained in the Irondale Gulch Outfall Systems Plan and Conceptual Design Report (Attachment A) prepared by the Urban Drainage & Flood Control District (now the Mile High Flood District).

Although no major drainageways or facilities are present in the area, the O'Brian Canal intersects/crosses E. 88th Avenue approximately 2,000 feet to the east of Brighton Road approximately 500 feet west of the Union Pacific Railroad crossing of E. 88th Avenue.

The O'Brian Canal is a diversion of the South Platte River, which diversion is located approximately 4.8 aerial miles southwest of the project study area. The O'Brian Canal flows northeast approximately 8.2 aerial miles where it empties into Barr Lake (Water Body Identification COSPMS04). Water from Barr Lake exits on the northeast side through several irrigation ditches—West Burlington Extension Ditch, Beebe Seep Canal, East Burlington Extension Ditch, Neres Canal, Denver-Hudson Canal, and Speer Canal. These irrigation ditches meander throughout the area north and northeast of Barr Lake, with some ditches eventually draining to uplands and others to the South Platte River east of Greeley, CO. Barr Lake (Water Body Identification COSPMS04) is listed on the 303(d) list of impaired waters for pH and dissolved oxygen (Colorado Department of Public Health and Environment, 2018).

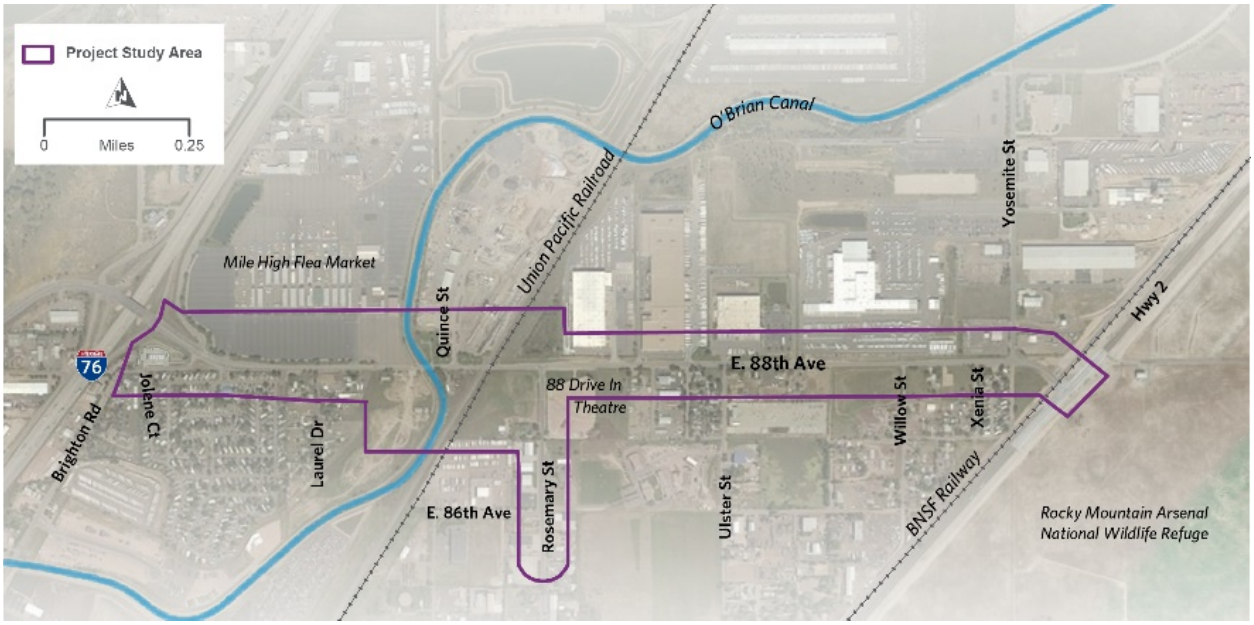
## 2.2 Proposed Project

*Describe the type of project (ex. new bridge, widening, full-depth replacement, turn lanes, etc.), project limits (including mileposts), and offsite and onsite flows in the project. Include the area of disturbance in acres; area required to be treated; area not treated; and area treated in addition to the area required to be treated. Include any unusual information that is specific to the project. The* ***project location map*** *should include locations of these items.*

The Proposed Action is bound on the west by the Interstate 76 (I-76) northbound ramps and on the east by Highway 2 (Figure 2). The Proposed Action would widen E. 88th Avenue from a two-lane arterial to a four-lane divided roadway west of Rosemary Street and a three-lane roadway east of Rosemary Street all

with curb and gutter. Rosemary Street would be widened from a two-lane roadway to a four-lane roadway between E. 88th Avenue and E. 86th Avenue. Preliminary Design Roadway Plans are located in Appendix D of the Environmental Assessment.

**Figure 2. Project Study Area**




Runoff from 88th Avenue would flow off the crowned road to new curb and gutter and into type R storm sewer curb inlets. Drainage from lateral pipes is treated in a series of hydrodynamic separators and conveyed in the trunk line flowing west beneath E. 88th Avenue. The 66" trunk line beneath E. 88th Avenue is part of the future Irondale Gulch Outfall system. Stormwater in the downstream-most portion of the trunk line would be pumped via a small-diameter forcemain under I-76 into a roadside borrow ditch that outfalls to the South Platte River. As part of a future action, the pump station would be removed when the planned Irondale Gulch Outfall is completed and is extended to the South Platte River. The Irondale Gulch Outfall System is described in the attached Irondale Gulch Outfall Systems Plan and Conceptual Design Report. In the future condition, the system will gravity drain to the river. The O'Brian Canal would not be affected by runoff from the Proposed Action, would not be used to capture more runoff than is currently intercepted, and would likely see a slight decrease in runoff as roadway drainage is better managed. Any future adjacent development will include adequate on-site detention, and the roadway stormwater system will not accept runoff from private properties subsequently developed.

The Proposed Action would disturb approximately 21.7 acres during construction. There are approximately 10.2 acres of existing impervious surface, and the Proposed Action would add an additional approximately 11.5 acres of new impervious surface.

The Federal Emergency Management Association Flood Insurance Rate Maps were reviewed on September 17, 2019. The project study area is located within Flood Insurance Rate Map 08001C0607H. Based on the review, there are no floodplains located within the project study area.

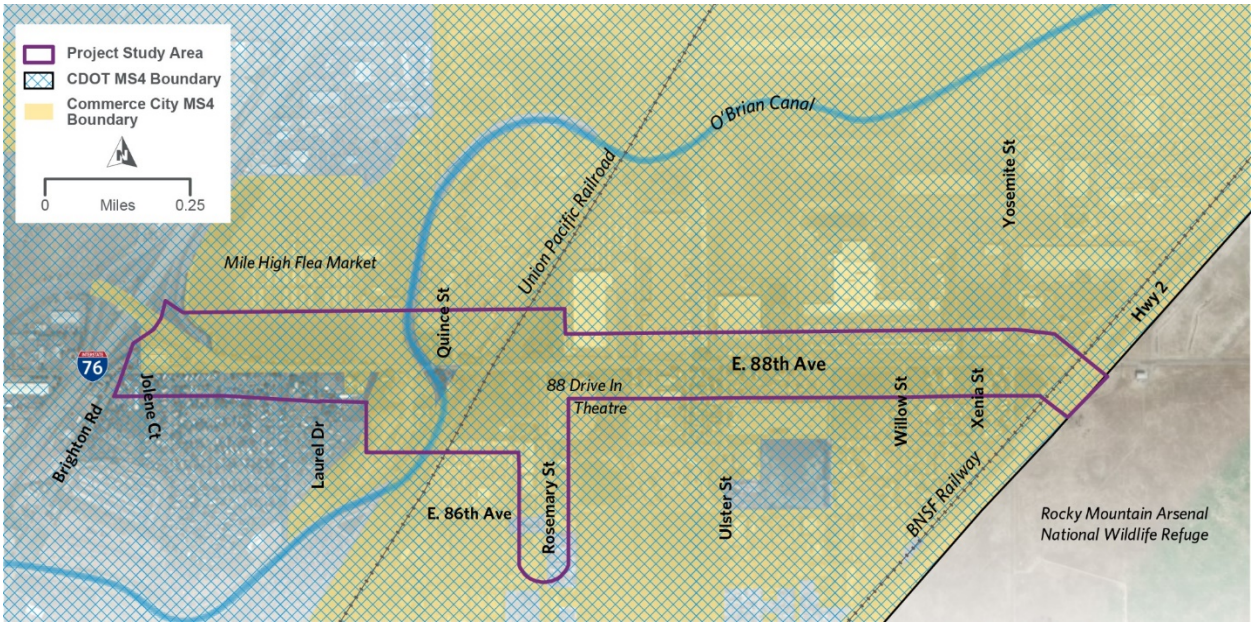
# 3.0 DISCUSSION OF MS4-PERMANENT WATER QUALITY REQUIREMENTS

*Describe which Municipal Separate Storm Sewer System jurisdictions are located within the project site, which jurisdictional Municipal Separate Storm Sewer System applies, and the resulting design objectives. If a local jurisdiction Municipal Separate Storm Sewer System applies, objectives may include items such as flood control or full-spectrum detention. Discuss those aspects, as necessary. If the receiving water is on the 303(d) list, include the pollutant for which the water is impaired. This section should be updated in the FIR report.*

The project study area is located within the boundaries of two Municipal Separate Storm Sewer System permits (Figure 3).

- Commerce City is currently bound by the Statewide Municipal Separate Storm Sewer System General Permit No. COR090000. The permit is issued by the Colorado Department of Public Health and Environment Water Quality Control Division. The boundary of this permit is concurrent with the political boundary of the city. A majority of the project study area is within this boundary; the only exceptions are an area adjacent to the northbound I-76 on-ramp, an area just south of E. 88th Avenue between I--76 and the O'Brian Canal, and an area near the southern limit of the project study area along Rosemary Street.
- CDOT was issued a Municipal Separate Storm Sewer System permit (Permit No. COS000005) on April 15, 2016 (expires June 30, 2021 and has been Administratively Continued). CDOT's Municipal Separate Storm Sewer System (MS4) permit boundary, while wholly contained within this project study area, is limited to CDOT right-of-way.

**Figure 3. MS4 Permit Boundaries**



East 88th Avenue is a locally owned road and within the limits of the Commerce City Municipal Separate Storm Sewer System boundary. Also, the project does not result in any additional impervious surface on CDOT owned facilities. Therefore, the project will adhere to the terms and conditions of the Commerce City Municipal Separate Storm Sewer System.

The Proposed Action would require compliance with the "Post-Construction Stormwater Management in New Development and Redevelopment" guidelines in the Municipal Separate Storm Sewer System permit because it creates more than 1.0 acre in ground disturbance. The permit requires the following permanent water quality treatment:

> "(A) Water Quality Capture Volume Standard: The control measure(s) is designed to provide treatment and/or infiltration of the Water Quality Capture Volume and: 1) 100% of the applicable development site is captured, except the permittee may exclude up to 20 percent, not to exceed 1 acre, of the applicable development site area when the permittee has determined that it is not practicable to capture runoff from portions of the site that will not drain towards control measures. In addition, the permittee must also determine that the implementation of a separate control measure for that portion of the site is not practicable (e.g., driveway access that drains directly to street)."

Based on the topography, the lack of an existing drainage system, and the water volume that would need to be treated, the treatment structure selected for the project is structural. Stormwater will drain from the road, into a catch curb, to type R curb inlets, though small underground lateral pipes (18" min), into a hydrodynamic separator, and into a regional trunk line. In the future, this trunk line will gravity drain into the South Platte River. In the interim, the downstream-most pipe constructed will be emptied via a temporary pump. Stormwater from the pump will move under I-76 in a small-diameter force main to a 24-inch corrugated metal pipe, a borrow ditch, several water quality ponds, and eventually outfall to the South Platte River. The Proposed Action would drain to the South Platte River—Water Body Identification COSPUS154—listed on the 303(d) list of impaired waters for ammonia, nitrates, dissolved oxygen, *e. Coli*, cadmium, and temperature (Colorado Department of Public Health and Environment, 2018).

# 4.0 PERMANENT WATER QUALITY CONTROL MEASURES

*See each subsection below for a description of what should be updated with the FIR submittal. The following are practices for documentation of the permanent water quality (PWQ) design and analysis:*

- *Calculations, analysis, and all related information used in developing conclusions and recommendations related to the Colorado Department of Transportation PWQ requirements, including alternatives, omissions, and locations shall be compiled in the Water Quality Report. All assumptions and criteria related decisions shall be documented.*
- *Design decisions shall be documented and based on sound engineering principles and optimal maintenance access/safety/mechanical cleaning ability.*
- *All related references shall be cited in the text, and provided in the report.*
- *Data and information shall be documented through all stages of the project as to provide successors with all information.*

- *Documentation shall be organized to lead the reader logically from the project scoping, background and resulting water quality impacts; through the alternatives, calculations and reasons for decisions; to final design, maps, and tables showing how the design meets CDOT's PWQ requirements.*

## 4.1 Existing Water Quality Control Measures

*Describe any existing control measures (CMs) that will be abandoned, reconfigured, or incorporated into a new design. Include a table and locations of any drainage inlets or outlets that will be abandoned, removed, changed or added. This discussion should be updated in the FIR report.*

Four detention ponds located on the private commercial properties north of E. 88th Avenue are the only existing water quality control measures within the project study area. There is no existing permanent water quality treatment in the project study area, so stormwater runoff infiltrates or drains overland to the O'Brian Canal and ultimately the South Platte River.

During construction, the primary concern is the increased potential for erosion from vegetation removal, excavation, and grading activities. Post-construction, the primary concern is the increase in impervious surface and the long-term maintenance of the permanent water quality features.

## 4.2 Permanent Water Quality Control Measure Alternatives

*Describe what types of CMs were considered for the project, the advantages and disadvantages of each, and how each meets PWQ requirements. A description of the alternatives should be updated in the FIR report, but can be general in nature.*

- Permeable Pavement—Considered but concerns with specialized maintenance and reduced pavement life due to heavy truck traffic in the corridor precluded this option.
- Bioretention—Considered but right-of-way area requirements precluded this option and topography is not conducive to allow outfall.
- Regional Water Quality—Considered but right-of-way constraints precluded this option. The project does include elements of a planned future regional outfall system (Irondale Gulch Outfall). This system could include a regional water quality facility, however this would be determined by the Mile High Flood District and is beyond the scope of this project.

## 4.3 Recommended Control Measures

*Describe the recommended CMs and why they were chosen. Note which Municipal Separate Storm Sewer System permit design standards are being met, and whether there are any related right-of-way needs or concerns.*

The existing and proposed impervious surface area and water quality treatment volume proposed with 15% design are summarized in Table 1. The storm sewer network receiving runoff from the roadways that connects to the Irondale Gulch Outfall would have a series of hydrodynamic separators to treat runoff before entering the outfall system. Recommended CMs will be further developed and refined during the final design process, development of the stormwater management plan and development of sediment controls during construction.

Table 1. Summary of Proposed Control Measure Impacts

| | |
|---|---|
| Existing impervious surface area within project limits | 10.23 acres |
| New impervious surface area within project limits | 11.45 acres |
| Total impervious surface | 21.68 acres |
| Impervious surface area being treated by proposed Control Measures | 20.60 acres |
| Additional impervious surface area treated by the project | 0 acre |
| Impervious surface area treated within project limits | 95 % |

## 4.4 Exhibit Map

*Develop an exhibit map including the items listed below. A preliminary PWQ Map, or separate maps and/or exhibits that follow the template below should be included in the FIR report. In addition to the items listed below, include a table in the narrative for this map that is similar to the table discussed in item 6, but also includes the pervious area that drains to each CM. The pervious area will be included in Colorado Department of Transportation geographic information system coverage of what is treated as required by the Municipal Separate Storm Sewer System permit.*

1. *Delineate the drainage basin tributary to each PWQ CM with a colored, solid-filled or hatch pattern. Provide different colors for each tributary basin where there are multiple CMs. These basins may include several subbasins from the Hydraulic Design Report.*
2. *Label each water quality basin with the typical basin designation circle label. Include within the circle the water quality basin identification, the basin area, and the impervious area with that basin. Provide a legend to describe the basin designation label.*
3. *Label the proposed PWQ CM serving each water quality basin. Ensure that the location of the CM matches the locations in the construction drawings.*
4. *Show flow direction arrows.*
5. *Delineate the disturbed area for the project.*
6. *Develop a table with six column headings. The column headings will be Basin Color, Basin identification, Total Basin Area, Type of PWQ CM, Required Area to be Treated, Actual Area Treated, and Comments. Provide the sum of the Required Area to be Treated and the sum of the Actual Area Treated at the bottom.* ***Note that the required area to be treated is all new impervious area within each water quality basin. The required area to be treated will only extend to the limits of disturbance.*** *Colorado Department of Transportation prefers to treat as much impervious area as is feasible within project limits. CMs should be sized for whatever flows reach them, regardless of whether these flows originate in within the project area.*
7. *In the comments column, note whether treated areas are on-site or off-site. If treated areas are off-site, note whether these areas are within Colorado Department of Transportation right-of-way or are owned by others.*
8. *If the required area to be treated is less than the actual area treated, provide a note on the Exhibit Map describing why flows from required area could not be treated. If some area treated is existing pavement, rather than new pavement, note the area treated.*

There is not a map at this level of design detail; however, each inlet or set of inlets receiving runoff from the roadways that connects to the outfall would have an offline hydrodynamic separator system to treat runoff before entering the outfall system.

# 5.0 MAINTENANCE AND OPERATION

Maintenance and operations will be performed by City of Commerce City.

## 5.1 Narrative Description of the Facility

To be developed during final design.

## 5.2 Narrative Description of How to Access the Facility

To be developed during final design.

## 5.3 Narrative Description of Required Maintenance

To be developed during final design.

## 5.4 Documentation of Commitments

To be developed during final design.

# 6.0 ATTACHMENTS

The design is pre-FIR in detail and water quality information has not been developed to a level for FIR submittal for the following attachments. These attachments will be included with the FIR submittal of this Water Quality Report, as required.

Attachment 1: Hydraulics and Permanent Water Quality Sheets from the final plan set. An FIR plan set for hydraulics and PWQ CM design should be provided in the FIR submittal.

Attachment 2: Maintenance Inter Governmental Agreements related to the project, signed and dated

Attachment 3: PWQ CM Required Plan Information Checklists, as applicable for the proposed CMs

Attachment 4: Operations & Maintenance Plan

# 7.0 REFERENCES

Colorado Department of Public Health and Environment. 2018. Integrate Water Quality Monitoring and Assessment Report. Available online at <https://www.colorado.gov/pacific/sites/default/files/2018%20IR.pdf>. Accessed February 2019.

# 8.0 MITIGATION

Table 2. Summary of Impacts and Mitigation

| Mitigation Category | Impact | Mitigation Commitment | Responsible Branch | Timing/Phase that Mitigation will be Implemented |
|---|---|---|---|---|
| Water Quality | Runoff to the O'Brian Canal or wetland complex north of Rosemary Street from construction activity | Adhere to the terms and conditions of the Colorado Discharge Permit System permit. | City of Commerce City, Contractor | Construction |
| Water Quality | Runoff from ongoing operations | Adhere to the terms and conditions of the Commerce City MS4 permit. | City of Commerce City, Contractor | Pre-Construction, Construction |

# Attachment A. Irondale Gulch Outfall Systems Plan and Conceptual Design Report

Appendix available upon request.