U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 8 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM STATEMENT OF BASIS

PERMITTEE:	U.S. General Services Administration
FACILITY NAME AND ADDRESS:	Downing Reservoir Groundwater Treatment System One Denver Federal Center, Building 41 Denver, CO 80225
PERMIT NUMBER:	CO-0035033
RESPONSIBLE OFFICIAL:	G.W. Emge, Acting Regional Administrator (GSA) (303) 941-6815 gw.emge@gsa.gov
FACILITY CONTACT:	Andi Driessner, Environmental Protection Specialist (GSA) (720) 309-5024 andrea.driessner@gsa.gov
PERMIT TYPE:	Minor, Industrial, Remediation, Renewal
FACILITY LOCATION:	White Conex near Downing Reservoir 39.7184 °N, 105.1114 °W May be moved northwest to Building 10 during this permit cycle, 39.7193 °N, 105.1121 °W

1 INTRODUCTION

This statement of basis (SoB) is for the issuance of a National Pollutant Discharge Elimination System (NPDES) permit (the Permit) to the United States General Services Administration (GSA or Permittee) for the Denver Federal Center (DFC) Downing Reservoir Groundwater Treatment System (Facility). The Permit establishes discharge limitations for any discharge of wastewater from the Facility through Outfall 001A to McIntyre Gulch. The SoB explains the nature of the discharges, the EPA's decisions for limiting the pollutants in the wastewater, and the regulatory and technical basis for these decisions.

The Facility is a federal facility in Colorado. The EPA Region 8 is the NPDES permitting authority for federal facilities located in Colorado.

2 MAJOR CHANGES FROM PREVIOUS PERMIT

Major changes from the previous permit include the following:

- An average monthly effluent limit of 0.98 μ g/L for 1,4-dioxane has been added, along with a compliance schedule for implementing the final effluent limit.
- Several effluent limitations have been switched from a daily maximum effluent limitation to a 30-day average effluent limitation.
- Effluent limitations for benzene and BTEX (the sum of benzene, toluene, ethylbenzene, and xylene(s)) have been removed.
- Visual monitoring for oil and grease has been increased from monthly to weekly.
- Semi-annual monitoring requirements in McIntyre Gulch for 1,4-dioxane have been added.
- Monitoring requirements for total inorganic nitrogen have been removed.
- The monitoring frequency for Whole Effluent Toxicity (WET) has been reduced from quarterly to annually.
- Outfall 001B has been removed to simplify reporting (see Section 7.1).

3 BACKGROUND INFORMATION

The Denver Federal Center (DFC) is located in Lakewood, Colorado. The DFC campus is approximately 670 acres and is bordered by 6th Avenue on the north, Kipling Street on the east, W. Alameda Avenue on the south, and Routt Street on the west (Figure 1).

Figure 1. Facility Location Map



The federal government originally purchased over 2,000 acres of land in Lakewood, Colorado in December 1940 for purposes of building the Denver Ordnance Plant, which produced ammunition in support of World War II. When the war ended so did ammunition production, and the space was converted into offices, warehouses, and laboratory space for multiple federal agencies. At this time it was renamed the Denver Federal Center (DFC). The footprint has shrunk over time as Lakewood has annexed portions of the property. The DFC has since been used by more than 27 different federal agencies. Agencies have used the property for many purposes, including but not limited to, pesticide and herbicide testing, animal testing, landfills (disposal of waste and construction debris), road material testing, storage of hazardous materials, firing ranges, burn pits, underground storage tanks, a wastewater treatment plant, and disposal of asbestos containing materials. Several of these uses have resulted in contaminated groundwater and soil on or below the property.

The GSA operates a groundwater treatment system that extracts approximately 20,000 gallons per day of groundwater contaminated with chlorinated volatile organic compounds (and associated compounds) from a plume associated with a former leaking underground storage tank, and then treats it prior to discharging it into the DFC's stormwater system that in turn discharges into nearby McIntyre Gulch. The groundwater treatment system and discharge location is shown in Figure 2.

The Permit authorizes discharge from one outfall – Outfall 001A – to McIntyre Gulch (Table 1). Additionally, a special condition to monitor McIntyre Gulch has been added to the Permit (monitoring location RW01). See sections 7.3 and 8.1 for more information on the receiving stream monitoring requirements.

Outfall Serial Number	Latitude (°N)	Longitude (°W)	Description	Receiving Water
001A	39.7172	105.1105	Any discharge from the Downing Reservoir Groundwater Treatment System's groundwater remediation process to McIntyre Gulch. This location is also known as DFC storm sewer system outfall 14OUT3002C. Effluent samples for Outfall 001A must be collected at the effluent sampling port located inside the Downing Reservoir Groundwater Treatment System.	McIntyre Gulch (via the DFC storm sewer system)
RW01	39.7212	105.0939	McIntyre Gulch downstream of the DFC	N/A

Table 1. Authorized Outfall Locations at the Facility

The following background information was obtained from the application for renewal of the Facility's permit; review of a Compliance Order on Consent; discussions with the Permittee; and observations made by the EPA permit writer during a December 2024 site visit.

3.1 Facility Process Description

In about 1978, the Federal Highway Administration (FHWA) installed two underground storage tanks located east of Building 52 near the center of the DFC campus. The first tank (product tank) was an approximately 250-gallon tank used to store unused 1,1,1-trichloroethane (1,1,1-TCA), while the second tank (waste tank) was an approximately 560-gallon tank used to store waste 1,1,1-TCA and associated waste solvents generated by the FHWA during the asphalt testing process. In 1989, the two tanks were tested and the waste tank was shown to be leaking. The FHWA performed some detailed soil testing adjacent to the waste tank, and these test results indicated the soil was contaminated with 1,1,1-TCA at concentrations as high as 470 parts per million. These two tanks were removed in December 1992, but the leaked waste solvent has created a contaminated groundwater plume that is generally moving east towards – and past – the eastern boundary of the DFC.

In 1996, the Colorado Department of Public Health and Environment (CDPHE) issued the GSA, as the owner/operator of the DFC, Compliance Order on Consent number 96-04-11-01, which required the GSA to construct and operate an interim corrective measure at the eastern boundary of the DFC, that prevents contaminated groundwater from migrating off-site. The CDPHE further stated that the GSA may choose to implement this interim corrective measure in conjunction with the FHWA.

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This resulted in Interim Measure Number 1 (IM#1), installation by FHWA and GSA of a subsurface funnel-and-gate permeable reactive barrier (PRB) with four iron treatment gates in November 1996 along the eastern boundary of the DFC (one of the treatment gates can be seen in Figure 2 in the grass in the upper right corner). The PRB was installed along Kipling Street, with the northern end just east of the north end of Downing Reservoir and the south end just north of McIntyre Gulch. The goal of the PRB was plume containment and treatment to control offsite migration and to protect the public health and environment.

Within a few years it was determined that the IM#1 objectives were not being achieved in all areas along the length of the PRB. Several improvements and modifications were completed, but it became apparent that additional improvements would be necessary to ensure the IM#1 met its objectives. By 2014, GSA was making plans to upgrade and improve the existing Downing Reservoir and during this planning, GSA began evaluating whether a groundwater interceptor trench could be integrated into the project to replace the aging IM#1. Downing Reservoir was drained and excavated with all contaminated sediment being hauled away. Then it was reconfigured and lined to protect it from future groundwater contamination (the GSA believes that Downing Reservoir is no longer contaminated by this contaminant plume).

In January 2015, the CDPHE approved a final corrective measure consisting of a groundwater interceptor trench and a groundwater treatment system (often referred to as the Downing Reservoir Groundwater Treatment System, GWTS [Facility]) to replace the aging PRB. Construction on this system was completed in the fall of 2017. The groundwater interceptor trench is located along the upgradient (west) side of the newly reconfigured Downing Reservoir to capture impacted groundwater and convey it to a sump where it is recovered for above ground treatment. The interceptor trench is 30 feet deep, approximately 1,100 feet long, and runs from just north of the Downing Reservoir to just south of it. The interceptor trench is tied into bedrock at its south end but not at the north end due to geology. Thus, GSA believes there may be some flow underneath and around the north end. This might be addressed in the future by increasing pumping/treatment or modifying the trench to capture this flow as well – these options would likely result in increased inflows into the Facility. The interceptor trench contains a sump near the southern end (Figure 2), which collects the intercepted water. The sump is large and oversized, and is designed to hold several weeks of water if the Facility ever went offline. The intercepted groundwater is treated at the Facility located on the west side of Downing Reservoir. This NPDES permit is to regulate the discharge of treated groundwater from the Facility.

The other groundwater treatment system at Building 52A was initially also an interim measure (IM#2) and was designed to capture and treat contaminated groundwater within the source area of the same groundwater plume that IM#1 treats at the eastern facility boundary. The Building 52A Treatment Plant discharges to McIntyre Gulch via the DFC storm sewer system in a separate location and under a separate EPA-issued NPDES permit (CO-0034860).

The two separate treatment systems (Building 52A Treatment Plant and Downing Reservoir Groundwater Treatment System) treat the same groundwater plume. The groundwater contains contaminants released by a former leaking underground storage tank in Building 52. The tank contained waste solvent and the affected groundwater is known to contain 1,1,1-trichloroethane, trichloroethene, 1,1-dichloroethene, 1,1-dichloroethane, and 1-4 dioxane, among other parameters.

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In 1997, the CDPHE issued the GSA, as owner/operator of the DFC, a second Compliance Order on Consent number 97-07-18-01 that requires the GSA to generally define and remediate all areas of contamination which have been identified and which result from past and present activities on the DFC. As such, that order is only indirectly related to this permitted discharge.



Figure 2. Facility Detail Map

3.2 Treatment Process

The treatment system treats groundwater that contains contaminants released by the former leaking underground storage tank. The contaminated groundwater flows generally east-northeast under the DFC until it hits the interceptor trench. The groundwater is then pumped from the interceptor trench sump located just south of Downing Reservoir to the Facility (the white Conex in Figure 2). The pumping rate is approximately 6 to 12 gallons per minute depending on the season. When the water enters the Facility, it first flows through a 7-inch stainless steel bag "pre-filter" before being deposited into a 2,100-gallon equalization basin. There is a float switch in the equalization basin which is set to trip once there is enough water to run the treatment process (typically about 500 to 750 gallons). This typically occurs about once every 45 to 60 minutes, although this varies based on the inflow rate. When the float switch trips, the pumps and the blowers for the air-stripping system turn on. The water is then pumped through a series of filters

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before entering an air stripping column. The air stripper contains a series of trays and an air supply from a pressure blower, which helps to facilitate the separation of volatile organic compounds from the liquid and release the volatile organic compounds to atmosphere via a vent stack on the outside of the Facility. A transfer pump then pumps the treated groundwater from the air stripper through a flow meter prior to being discharged. The system includes two ultrasonic flow meters – one on the influent line after it enters the building but before it reaches the equalization tank, and the other is in the discharge line just before it exits the building. The influent sampling port is located near the influent flow meter prior to the equalization basin, and the effluent sampling port (currently referred to as Outfall 001B, but this outfall label is being removed – see section 7.1) is located just past the flow meter before the effluent leaves the building.

Once the effluent leaves the building, it travels approximately 100 meters through a pipe to a holding bay located in the outfall structure at the south end of Downing Reservoir. This holding bay is separate from Downing Reservoir and does not mix or enter Downing Reservoir – it is divided into two compartments so that outflow from the treatment system cannot backflow into Downing. The treated effluent then flows approximately 100 meters south through a 36-inch concrete pipe to Outfall 001A (which is also referred to as DFC storm sewer outfall 14OUT3002C) where the effluent discharges to McIntyre Gulch.

The outlet structure at the Downing Reservoir can also release water from the reservoir. When water levels in Downing Reservoir get too high, GSA can open the outlet structure to allow Downing Reservoir water to discharge. At this point, it would commingle with treated water from the Facility. According to the GSA, this release only occurs a few times per year, typically in response to large rain events or water calls by the water commissioner. They did note that the outlet structure "weeps" water from the Downing Reservoir due to imperfect sealing, so there is typically a small trickle of water comminging with the Facility's discharge.

Sludge that accumulates at the bottom of the equalization tank is removed on an as-needed basis, but approximately once every three years. The bag filters are changed out approximately once every three months. All accumulated sediment and filters are disposed of off-site.

Based on samples collected by the Permittee, they are achieving a removal rate of approximately 95% to 98% for volatile organic compounds (Figure 3) and have had no permit exceedances over the past 8 years (Table 2).

The Permittee is considering abandoning/removing the white Conex and moving the Facility approximately 100 meters north-northwest to Building 10 (this is just off the map in Figure 2), depending on budgets and required upgrades associated with the 1,4-dioxane effluent limitations (see section 8.2). The outfall would remain in the same location if this were to occur.



Figure 3. Observed Removal Rates for Select Volatile Organic Compounds at the Facility

*Note that several VOCs – such as 1,1,1-TCA, 1,1-DCE, and vinyl chloride (chloroethene) – were either not observed in the effluent or not observed in the influent (or both), so a percent removal calculation was impractical.

3.3 Chemicals Used

The Permittee does not currently add any chemicals during the treatment process. However, the Facility may need to upgrade their treatment system to meet the new permit effluent limits for 1,4-dioxane (see section 6.5.9). If plant upgrades introduce the use of additional chemicals in the treatment process, the Permit may be reopened to include permit conditions related to those compounds (see section 9.15.5 of the Permit).

4 PERMIT HISTORY

According to the EPA records maintained for the Facility, this renewal is the 2nd issuance of this NPDES permit. The previous permit for the Facility was originally issued on September 1, 2018 and was set to expire on August 31, 2023. The Facility submitted a permit renewal application prior to the permit's expiration, and thus the previous permit was administratively continued.

4.1 Discharge Monitoring Report (DMR) Data

The groundwater remediation activity discharges in frequent batches (approximately 30 per day) throughout the day such that it discharges nearly continuously (see section 3.2). The Permittee reported discharges at Outfall 001B every month from 2018 to present. The Permittee reported no exceedances of any effluent limitations (Table 2). Although not shown in the table below, the Facility did not report any visual observations of oil and grease in the effluent.

Many organic chemical compounds have multiple names. For example, the compound C₂Cl₄ may be called tetrachloroethylene, tetrachloroethene, perchloroethene, and perchloroethylene interchangeably. To minimize confusion, an effort has been made to consistently use the nomenclature system developed by the International Union of Pure and Applied Chemistry (IUPAC), an international organization that sets standards for chemistry. Thus, the compound above is

referred to as tetrachloroethene throughout when called out by its full name (although abbreviations are also used). The only departure from this is for the compound chloroethene, which is overwhelmingly referred to as vinyl chloride in the U.S. Therefore, this compound is referenced as "vinyl chloride (chloroethene)" throughout the SoB and the Permit.

Parameter	Permit Limit(s)	Reported Average/Median <u>a</u> /	Reported Range	Number of Data Points	Number of Exceedances
Discharge Volume, 30-	0.042	0.010	0.005 –	70	0
gallons per day (mgd)	0.043	0.018	0.034	76	0
Discharge Volume, Daily Maximum, mgd	0.072	0.030	0.012 – 0.072	76	0
Total Suspended Solids (TSS), 30-Day Average, mg/L	30	ND	ND – 17	76	0
BTEX, μg/L	100	ND	ND	76	0
Benzene, μg/L	5.0	ND	ND	76	0
1,1-Dichloroethene, μg/L	7.0	ND	ND - 0.335	76	0
1,1,1-TCA, μg/L	200	ND	ND	76	0
cis-1,2-dichloroethene, μg/L	70	ND	ND – 0.323	76	0
TCE, μg/L	5.0	ND	ND – 4.4	76	0
Vinyl Chloride (chloroethene), μg/L	2.0	ND	ND	76	0
pH, standard units	6.5 – 9.0	8.0	7.3 – 8.3	76	0
1,1-Dichloroethane, μg/L	N/A	ND	ND – 0.84	76	N/A
Total Phosphorus, mg/L	N/A	ND	ND – 0.22	28	N/A
Total Inorganic Nitrogen, mg/L	N/A	4.6	3.0 - 7.4	28	N/A
Temperature, °C <u>b</u> /	N/A	21.2	18.1 – 23.8	73	N/A
Whole Effluent Toxicity	N/A	N/A	All "pass"	25	N/A

Table 2. Summary of the DMR Data (October 2018 – January 2025) for Outfall 001B from the EPAIntegrated Compliance Information System (ICIS) database (date accessed: 2/25/25)

<u>a</u>/ Any parameter which has reported non-detect (ND) values will have a median reported in this column. The pH value in this column is also a median.

<u>b</u>/ In their DMR report, the Permittee reported their February 2023 temperature as 238°C, and their February 2019 temperature as 11.7°C. The EPA followed up with the Permittee, who verified that these were transcription errors and should have been 23.8°C, and 22.6°C, respectively.

5 DESCRIPTION OF RECEIVING WATER

Discharges from the Facility enter the stormwater system at the DFC, which ultimately drains into McIntyre Gulch (Figure 2). McIntyre Gulch then flows approximately two miles before discharging

into Lakewood Gulch. Lakewood Gulch flows approximately four miles from its confluence with McIntyre Gulch before entering the South Platte River just south of Empower Field at Mile High stadium near downtown Denver (Figure 4). McIntyre Gulch is located within the United States Geological Survey's Hydrologic Unit Code (HUC) 10190002 (Upper South Platte).



Figure 4. Stream Network downstream of the Denver Federal Center

McIntyre Gulch does not have any continuous streamflow gages on it, but the USGS collected approximately 50 to 100 flow measurements both upstream and downstream of the DFC on McIntyre Gulch between 1996 and 2000. The median flow in the vicinity of the DFC was approximately 1 cubic foot per second (cfs) during this time (although it ranged from 0.2 cfs to 73 cfs). According to the Permittee, McIntyre Gulch is a perennial stream with continuous surface flow in the channel. It tends to flow at baseflow conditions much of the year and then guickly increase in flows during precipitation events. Based on this limited dataset, it is not possible to calculate a chronic or acute low flow at this location. However, when this permit was originally issued in 2018, the local water commissioner was contacted to obtain an estimate of the low flow for McIntyre Gulch. Per the state of Colorado, this is a common practice in the absence of sufficient flow data. Communication with the local water commissioner resulted in the adoption of 0.2 cfs as the chronic low flow condition for the McIntyre Gulch stream segment, and 0.5 cfs as the chronic low flow condition for the Lakewood Gulch stream segment. There have been no known additional flow measurements taken in McIntyre Gulch since, so the 2018 estimate will be used for subsequent analysis. The state of Colorado uses the 30E3 (also known as the 30B3) as the chronic low flow condition, which is the empirical biologicallybased chronic 30-day low flow over a 3-year period of record.

6 PERMIT LIMITATIONS

6.1 Coordinated Individual Permits

Coordinated individual permits are permits that include water quality based effluent limits and other conditions developed using a more holistic analysis of watershed conditions. This permit is being issued nearly concurrently with another NPDES permit at the DFC. This other permit (CO-0034860) is issued to the Federal Highway Administration (FHWA). It treats the same plume from the same former leaking underground storage tank, and discharges to the same receiving stream (McIntyre Gulch) approximately 750 meters upstream from this discharge. These two facilities have had previous discussions about combining treatment efforts to build one large treatment system, although there are no plans to move forward with this concept at this time. Both facilities discharge treated groundwater at similar rates (0.043 mgd vs. 0.029 mgd as permitted 30-day average flow limits for the Facility and for FHWA, respectively).

Because of these similarities, a considerable effort has been made to align these two permits' conditions as much as possible. While the distance from the source of the plume is different for the two permits (and thus a marked difference in observed influent concentrations at the two facilities), there is little justification to develop differing permit conditions. Thus, this permit issuance makes several changes to previous permit limits. The renewal effort has focused on addressing the chlorinated solvents and other compounds that are associated with the leaking underground storage tank.

The effort to treat these as coordinated individual permits can also be seen in the limit calculations for 1,4-dioxane, vinyl chloride (chloroethene), and trichloroethene – both discharges have been considered in the dilution/mixing calculations, receiving water monitoring requirements, and other potential impacts associated with Lakewood Gulch (see section 6.5.9 and section 8.1).

6.2 Technology Based Effluent Limitations (TBELs)

There are no applicable Federal Effluent Limitation Guidelines for this type of wastewater discharge (i.e., groundwater remediation of chlorinated solvents). Previously, the EPA used Best Professional Judgment to evaluate the Facility's performance capabilities per 40 CFR § 125.3, and applied a case-by-case TBEL for several pollutants, including benzene, BTEX, total suspended solids, oil and grease, and several chlorinated solvents. Some of these case-by-case TBELs are being retained, while others are being removed. These are all discussed further below.

After a review of the nature of the Facility (i.e., groundwater remediation), pollutant reductions currently attained by the Facility (see section 3.2), and the applicable state of Colorado water quality standards (see section 6.3), the EPA has determined that no additional TBELs will be considered for the Facility.

6.2.1 Benzene/BTEX

Benzene and the combined benzene, toluene, ethylbenzene, and xylene compounds (collectively referred to as "BTEX") are commonly found in petroleum discharges. These compounds are hazardous to human health and aquatic life. The previous permit established a case-by-case

technology based effluent limit based on an example permit that the EPA developed in 1989¹ for cleanup of gasoline based compounds. The limit for benzene was also based in some part on consideration of the drinking water Maximum Contaminant Level for benzene. However, the purpose of the Facility's process producing a discharge is to remove 1,1,1-TCA and associated waste products from a former leaking underground storage tank. Benzene and BTEX materials were not associated with this leaking tank, have never been detected in either the influent or the effluent at the Facility, nor have they ever been detected in the influent or effluent at the other permitted facility that treats the same contaminant plume. These pollutants are not present in the discharge and are not associated with the industry type (i.e., groundwater remediation of chlorinated solvents), and therefore the EPA is removing the case-by-case TBELs associated with benzene and BTEX. See sections 6.5 and 6.8 for further discussion.

6.2.2 Total Suspended Solids

Total suspended solids (TSS) includes both organic and inorganic materials. The inorganic compounds typically include sand, silt, and clay. The organic fraction typically includes such materials as organic carbon, grease, oil, and tar. Suspended solids may be present in groundwater through pumping actions, or naturally present in groundwater in small quantities. TSS can interfere with removal of other pollutants, and as such should be removed early in the treatment process if possible. TSS can also coat and foul equipment, causing extra expenses.

TSS is easily controlled with simple filtration. For the Facility, the EPA previously used professional judgment to establish a case-by-case limitation for TSS of 30 mg/L as a 30-day average limit, based loosely on the guidance in Colorado Regulation Number 62 (Regulations for Effluent Limitations), which provides certain effluent limits that should be applied in permits regardless of receiving water. This case-by-case TBEL will be retained in the Permit.

6.2.3 Oil and Grease

The Facility uses pumps and other machinery in their operation. Machinery such as these may contain oils and petroleum products, and they represent a potential for discharge of oil and grease. The Discharge of Oil Regulation or "sheen rule" prohibits discharges of oil in such quantities as may be harmful (40 CFR § 110.3). Oil and grease are easily observed, and if observed, are controlled usually through simple operations and maintenance inspections. For the Facility, the EPA previously used professional judgment to establish a case-by-case limitation for oil and grease of 10 mg/L as a daily maximum limit, based loosely on the guidance in Colorado Regulation Number 62 (Regulations for Effluent Limitations), which provides certain effluent limits that should be applied in permits regardless of receiving water. This TBEL implements a dual approach to protect against oil and grease discharges: frequent visual observations of the discharge point looking for a visible sheen or floating oil, and if either of those is observed, a sample must be immediately taken and analyzed for oil and grease. This case-by-case TBEL will be retained in the Permit.

¹ USEPA, June 1989. Model NPDES Permit for Discharges Resulting From The Cleanup of Gasoline Released From Underground Storage Tanks and Fact Sheet

6.2.4 Chlorinated Solvents

The previous permit referred to limits established for several chlorinated compounds as TBELs. These compounds included 1,1-dichloroethene (1,1-DCE), 1,1,1-trichloroethane (1,1,1-TCA), cis-1,2-dichloroethene (cis-1,2-DCE), trichloroethene (TCE), and vinyl chloride (chloroethene). These limits were established based on the Safe Drinking Water Act Maximum Contaminant Levels, which the state of Colorado has adopted as water supply use water quality standards. Since this TBEL was based solely on water quality standards, and because there was no additional analysis of what could be achieved by existing control technologies, these are more properly identified as water quality based effluent limits established at end-of-pipe, and thus there are no TBELs for these chlorinated solvents. Since these limits are water quality based, they will be discussed further in the next section.

6.3 Water Quality Based Effluent Limitations (WQBELs)

The receiving waters are within the state of Colorado and thus state of Colorado water quality standards (WQS) apply. The Facility discharges to McIntyre Gulch, which is a tributary of Lakewood Gulch, which in turn is a tributary of the South Platte River. The discharge is small but effectively continuous in nature, and only flows approximately two miles in McIntyre Gulch before it reaches Lakewood Gulch. Based on these considerations, WQS for both the immediate receiving water (McIntyre Gulch) and the next downstream water (Lakewood Gulch) were considered. A general description of the receiving waters can be found in section 5. Due to the small size of the discharge, and the Facility's location several hundred miles upstream of the next downstream state (Nebraska), no other jurisdiction's WQS were considered in the development of the Permit. The state of Colorado also implements total maximum daily loads (TMDLs) to address waters that are impaired. Below, the EPA has reviewed the applicable state of Colorado water quality standards for the development of WQBELs and evaluated whether any total maximum daily loads (TMDLs) apply.

6.3.1 Colorado Regulation Number 31 – The Basic Standards and Methodologies for Surface Water

Colorado Regulation Number 31 provides basic standards, an antidegradation rule and implementation process, and defines a system for assigning beneficial uses. It is the basis for the water quality standards assigned to these stream segments in Colorado Regulation Number 38. This regulation also includes a table with standards for organic chemicals for different human health and aquatic life based designated uses (section 31.11, Table B).

6.3.2 Colorado Regulation Number 38 – Classifications and Numeric Standards for South Platte River Basin, Laramie River Basin, Republican River Basin, Smoky Hill River Basin

Colorado Regulation Number 38 provides basic, narrative, and numeric water quality criteria for the specific stream segments affected by the Permit. According to this regulation, McIntyre Gulch is within segment 16c of the South Platte River (COSPUS16c). COSPUS16c is described as "all tributaries to the South Platte River, including all wetlands, from the outlet of Chatfield Reservoir to a point immediately below the confluence with Big Dry Creek, except for specific listings in the subbasins of the South Platte River, and in Segments 16a, 16d, 16e, 16f, 16g, 16h, 16i, 16j, and 16k." Classifications and designations are listed below for this segment.

- Classifications: Agriculture, Aquatic Life Warm 2, Recreation E
- Designation: Use Protected

Lakewood Gulch is within segment 16k of the South Platte River (COSPUS16k). COSPUS16k is described as "Mainstem of Lakewood Gulch from the source to the confluence with the South Platte." Classifications and designations are listed below for this segment.

- Classifications: Agriculture, Aquatic Life Warm 1, Water Supply, Recreation E
- Designation: Reviewable

Classifications and Designations are defined in Colorado Regulation Number 31 and these definitions are provided below:

Agriculture: These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Aquatic Life: These surface waters presently support aquatic life uses as described below, or such uses may reasonably be expected in the future due to the suitability of present conditions, or the waters are intended to become suitable for such uses as a goal:

- Class 1 Warm Water Aquatic Life: These are waters that (1) currently are capable of sustaining a wide variety of warm water biota, including sensitive species, or (2) could sustain such biota but for correctable water quality conditions. Waters shall be considered capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.
- Class 2 Cold and Warm Water Aquatic Life: These are waters that are not capable of sustaining a wide variety of cold or warm water biota, including sensitive species, due to physical habitat, water flows or levels, or uncorrectable water quality conditions that result in substantial impairment of the abundance and diversity of species.

Domestic Water Supply: These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent) these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.

Recreation (Class) E: These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.

Reviewable: Waters listed as reviewable are subject to an antidegradation review for regulated activities with new or increased water quality impacts that may degrade the quality of state surface waters. This category includes waters that have not been designated as outstanding waters or use protected waters.

Use Protected designation: The purpose of these provisions is to identify waters whose quality is not better than the federal "fishable, swimmable" goal, and which therefore are appropriately not subject to the antidegradation review process.

Per Colorado Regulation Number 31 (section 31.11, Table B), all three human health based criteria (i.e., Water Supply, Water + Fish, and Fish Ingestion) and both aquatic life based criteria (i.e., Acute and Chronic) apply to Lakewood Gulch (see section 31.11, Table B, footnotes 2, 3, 4, and 8), while only the aquatic life based criteria apply to McIntyre Gulch (see section 31.11, Table B, footnote 4). All human health based criteria are chronic criteria, as is the chronic aquatic life criteria. Therefore, when a chronic criteria is discussed in the reasonable potential calculations and permit limit determinations, the value discussed represents the most stringent of the *applicable* chronic categories listed above. The acute criteria always refers to the acute aquatic life based criteria.

6.3.3 Stream Impairments and Total Maximum Daily Loads (TMDLs)

Currently, segment 16c (which includes McIntyre Gulch) is on the 303(d) list as impaired for *E. coli* and dissolved selenium. These listings are both in category 5, which is defined as "impaired without a TMDL completed." Thus, there are no TMDLs developed for McIntyre Gulch at this time. The listing priority for *E. coli* is "High", and the listing priority for dissolved selenium is "Low." Regardless, *E. coli* and selenium are not considered pollutants of concern at the Facility.

McIntyre Gulch discharges to Lakewood Gulch, which then discharges to the South Platte River. The state of Colorado does not have any 303(d) listings or TMDLs for Lakewood Gulch. The state of Colorado has implemented several TMDLs for the South Platte River downstream of the Facility, including TMDLs for *E. coli*, cadmium, nitrate, and dissolved oxygen. This discharge is not assigned a wasteload allocation (WLA) in any of these TMDLs, and *E. coli*, metals, nitrate, and dissolved oxygen are not considered pollutants of concern at the Facility. The Permit contains a reopener provision that could be used if a WLA is developed via a TMDL for this watershed or a downstream watershed in the future.

6.4 Pollutants of Concern (POCs)

Pollutants of concern were identified based on whether there are applicable TBELs, whether there are applicable WLAs from a TMDL, whether there were WQBELs in the previous permit, and whether pollutants were identified as present through monitoring – or expected to be present – in the discharge. To evaluate whether pollutants were expected to be present in the discharge, the EPA also considered whether any pollutants (or their degradation products) were specifically identified in the Compliance Order on Consent, and/or identified as present through monitoring in the contaminated groundwater plume.

As discussed in section 6.1, total suspended solids, oil & grease, benzene and BTEX (sum of benzene, toluene, ethylbenzene, and xylene(s)) were limited in the previous permit using a case-by-case TBEL. As discussed in section 6.3.3, there are no WLAs applicable to this discharge. There are several WQBELs (numeric or narrative) that were included in the previous permit. These include 1,1,1-trichloroethane (1,1,1-TCA), trichloroethene (TCE), 1,1-dichloroethene (1,1-DCE), cis-1,2-dichloroethene, vinyl chloride (chloroethene), and pH. These compounds are pollutants of concern and are discussed further in section 6.5.

There are several pollutants that are known or expected present. This Permit authorizes discharges from the same contaminant plume that another EPA-issued NPDES permit addresses (i.e., NPDES permit CO-0034860). This plume is a specific and defined contaminant source resulting from a

leaking underground storage tank containing 1,1,1-TCA, and degradation products, impurities, and stabilizers associated with 1,1,1-TCA.

In August of 1995, Rust Engineering performed a detailed site investigation to categorize the plume. This included discussions with the FHWA, GSA, and CDPHE, as well as groundwater and subsurface soil sampling in the vicinity (and downgradient) of Building 52. Initial discussions identified that approximately 95% of the solvent discharged to the waste tank was 1,1,1-TCA. Another consultant also performed a detailed study of the DNAPLs (dense nonaqueous phase liquids) found in monitoring well FHA-2, which was located approximately 20 feet east (i.e., downgradient) of the leaking underground storage tank. This DNAPL was on average composed of 89% 1,1,1-TCA, 12% 1,1-DCE, and <0.1% TCE, PCE, and 1,1-DCA. The study opined that the small amounts of related chlorinated solvents were probably impurities in the original 1,1,1-TCA product. Additionally, trace amounts of hydrocarbons including toluene, ethylbenzene, styrene, and xylenes were also detected, along with 4-methyl-2-pentanone, bromomethane, chloromethane, and methylene chloride. 1,4dioxane was not tested for at that time. No semivolatile or gasoline/petroleum related compounds were detected at levels above reporting limits, and with the exception of chromium (which was found just above the detection limit), all metals requested for analysis were not detected. Based on this, gasoline/petroleum based organic compounds and metals are not pollutants of concern at the Facility.

Further analysis of compounds known or expected present is provided below.

6.4.1 Chlorinated ethanes (1,1,1-trichloroethane and degradation products)

1,1,1-TCA is the primary pollutant associated with this discharge. It is a chlorinated solvent with three chlorine atoms attached to the same carbon atom of an ethane molecule (a C-C single bond). The degradation pathway depends on environmental conditions but can include the chlorinated solvents 1,1-DCA, chloroethane (aka ethyl chloride), 1,1-DCE, and vinyl chloride (chloroethene). These five compounds are considered pollutants of concern.

6.4.2 Chlorinated ethenes

Tetrachloroethene (also known as perchloroethylene, perchloroethene, tetrachloroethylene, or PCE) and trichloroethene (trichloroethylene or TCE) are chlorinated solvents with either three (i.e., TCE) or four (i.e., PCE) chlorine atoms attached to an ethene molecule (a C=C double bond) (Figure 5). These were noticed present in the original waste solvent leak. The degradation pathways depends on environmental conditions but can include other chlorinated solvents such as 1,1,2-trichloroethane (1,1,2-TCA), 1,1-DCE, 1,2-dichloroethene (both cis and trans), vinyl chloride (chloroethene), 1,1-DCA, 1,2-dichloroethane, and chloroethane. These ten compounds are pollutants of concern.



Figure 5. The Chlorinated Ethenes PCE and TCE

6.4.3 Other Volatile Organic Compounds (VOCs)

Other VOCs were scanned by the Permittee as part of their regular monitoring unrelated to this NPDES permit. In total, the Permittee regularly scans for 11 VOCs and semivolatile organic compounds in the influent at the Facility. In approximately 15 scans over the past six years, the Facility has only detected five compounds in the influent above the reporting limit – the other six compounds have been below the reporting limit in all cases. These five detected compounds are 1,1-DCA, 1,1-DCE, cis-1,2-DCE, TCE, and 1,4-dioxane. These five compounds are pollutants of concern.

6.4.4 Other compounds

Nutrients such as nitrogen and phosphorus are generally not considered to be pollutants of concern in discharges that consist solely of groundwater dewatering. While some facilities at the DFC do use a phosphate-based anti-scaling compound in their treatment process, the Facility does not currently add nitrogen or phosphorus, and therefore nutrients are not pollutants of concern.

6.4.5 Summary – Pollutants of Concern

When all pollutants identified above were combined, there were nineteen unique pollutants identified as pollutants of concern. These pollutants are further analyzed in section 6.5 to determine whether they need to be limited in the Permit to ensure protection of all WQS.

- 1) 1,1-DCA
- 2) 1,1-DCE
- 3) 1,1,1-TCA
- 4) 1,1,2-TCA
- 5) 1,2-DCA

- 6) 1,2-DCE (cis)
- 7) 1,2-DCE (trans)
- 8) 1,4-dioxane
- 9) Benzene
- 10) BTEX (sum of benzene, toluene, ethylbenzene, and xylenes)
- 11) Chloroethane (ethyl chloride)
- 12) Oil and grease
- 13) pH
- 14) Temperature
- 15) Tetrachloroethene (PCE)
- 16) Total suspended solids (TSS)
- 17) Trichloroethene (TCE)
- 18) Vinyl Chloride (chloroethene)
- 19) Whole effluent toxicity (WET)
- 6.5 Justifications and Reasonable Potential Determinations for Final Effluent Limitations and Monitoring Requirements

As discussed in section 3, a 1996 Compliance Order on Consent ordered the GSA to construct and operate an interim corrective measure at the eastern boundary of the DFC to prevent contaminated groundwater from migrating off-site. While the Compliance Order on Consent did not directly address discharges to McIntyre Gulch, it did indicate the contamination at the DFC must not pose a threat to human health and the environment. It also called out several contaminants that were known to exist on the DFC (specifically in the area of Downing Reservoir) at levels greater than state ground water standards, specifically 1,1,1-trichloroethane, trichloroethene, and vinyl chloride (chloroethene).

The EPA originally implemented permit conditions using state of Colorado WQS applicable to Lakewood Gulch related to drinking water supply and applied them at the end of pipe as an extra level of precaution. Therefore, many of the original water quality-based effluent limits do not have an allowance for mixing. While this is conservative considering the actual designated use is two miles downstream, for purposes of anti-backsliding – and because the Facility appears to be meeting them regularly (Table 2) – these end of pipe limits will be retained as is. But moving forward, the EPA has determined that it may consider mixing and dilution for development of any additional WQBELs as appropriate. This change in approach can be seen in the evaluation of newly applied WQS for 1,4-dioxane and TCE in this section.

Additionally, the previous permit implemented several of the organic compound limits as daily maximum limits. Since these are based on chronic criteria, this was an incorrect interpretation of the WQS. These have been changed to average monthly limits in the Permit. This change is further discussed below in each relevant section, as well as discussed in the anti-backsliding section (section 6.8).

When establishing permit limits, 40 CFR § 122.45(d)(1) requires the permitting authority to include both maximum daily and average monthly discharge limitations for all continuous dischargers other than publicly owned treatment works, *unless impracticable*. The EPA reviewed options for developing both types of permit limits and determined that, for several parameters in the Permit, it was impracticable to do so for several reasons. First and foremost, the limits and wasteload allocations discussed below for VOCs are based on chronic criteria. Implementing a maximum daily limit (MDL) would require some basis for calculating a value. Chapter 5 of the EPA's Technical Support Document for Water Quality Based Toxics Control (TSD)² includes statistical tools for calculating MDLs and average monthly limits (AMLs) from the long term average value when pollutants with effluent concentration measurements follow a lognormal distribution. The EPA has not developed guidance on procedures for calculating effluent limitations for pollutants with effluent concentrations that generally cannot be described using a lognormal distribution. The effluent data for the Facility is not always lognormally distributed – e.g., several of the parameters show 100% (or nearly 100%) 'non-detect' values in the effluent (Table 2). Additionally, for many VOCs, the state of Colorado's acute criteria are based on aquatic life, while the chronic criteria are based on human health. The criteria associated with aquatic life are typically hundreds to thousands of times higher than the criteria associated with human health (for example, TCE has an applicable chronic criteria of 2.5 μ g/L and an applicable acute criteria of 45,000 μ g/L – 18,000 times higher than the chronic criteria). To be clear, due to this difference in magnitude, there is likely no reasonable potential to cause or contribute to an exceedance of the acute criteria, and establishing an MDL based on that value would be meaningless (and thus impracticable). After careful consideration – and due to the Facility's monthly monitoring requirements that render the value reported as the daily maximum effectively equivalent to that reported for the 30-day average – the EPA has determined that it would be impracticable to implement a number for a daily maximum value just to have something in the Permit, when it likely won't have an effect on compliance or operations. The Facility is a long-term groundwater remediation discharger with low variability in their influent and effluent whose primary purpose is to remove VOCs over the course of years and decades. The EPA is confident that the defensible criteria-based AMLs will result in the protection of WQS.

Several of the reasonable potential analyses below mention the consideration of existing controls on point sources (see 40 CFR § 122.44(d)(1)(ii)). This generally refers to the concept that many of the chlorinated organic compounds have similar chemical characteristics, and the EPA expects – and the available data suggests – that in most instances, efficient control or removal of one chlorinated organic compound will also ensure removal of other chlorinated organic compound with similar chemical characteristics. The data presented in Figure 3 is an example of this concept – the current treatment system is not designed to treat for any one compound, but rather chlorinated VOCs in general.

6.5.1 Flow

The previous permit contained a flow limit of 0.043 mgd as a 30-day average and 0.072 mgd as a daily maximum. According to the previous statement of basis, these values were based on the Facility's design capacity. The state of Colorado typically requires all pollutants (with a few exceptions) to have limitations expressed in terms of either concentration and mass or concentration and flow. Since there are no limitations in terms of mass in the Permit, the previous flow limits will be retained.

² U.S. EPA. Technical Support Document for Water Quality based Toxics Control, EPA/505/2-90-001, U.S. EPA Office of Water, March 1991

6.5.2 1,1-Dichloroethane (1,1-DCA)

1,1-DCA was detected in every influent sample and just over half (53%) of the effluent samples. The highest influent concentration detected was 2.9 μ g/L, with a median influent concentration of 2.35 μ g/L. Effluent samples are summarized in Table 2. Since this compound was not originally stored in the leaking underground storage tanks, nor was it reported in the initial clean-up reports, it is likely that it is the product of degradation of 1,1,1-TCA via reductive dechlorination under anaerobic conditions, which would be expected in groundwater.

The state of Colorado has not adopted a WQS for 1,1-DCA. The toxicity of 1,1-DCA is not as well understood as some of the other chlorinated organic compounds, but the EPA designated it as a high priority chemical in 2019. In July 2024³, the EPA released the draft risk evaluation under the Toxic Substances Control Act (TCSA) for 1,1-DCA for public comment and peer review. The EPA's draft risk evaluation preliminarily shows unreasonable risk to human health because occupational exposure to 1,1-DCA may increase the risk of kidney and other cancers, as well as harmful noncancer renal, nasal, immune system, and reproductive effects to workers in facilities making or using 1,1-DCA. However, the EPA preliminarily found no unreasonable risk to the general population from ingesting drinking water or surface water. The EPA also found no unreasonable risks to potentially exposed and susceptible subpopulations, which includes infants exposed to drinking water during formula bottle feeding, subsistence and tribal fishers, pregnant women and people of reproductive age, and individuals with compromised immune systems or neurological disorders.

Based on this information, and the absence of any adopted WQS by the state of Colorado, reasonable potential to cause or contribute to an exceedance of a WQS does not exist, and effluent limitations will not be required in the Permit.

6.5.3 1,1-dichloroethene (1,1-DCE)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 7 μ g/L for 1,1-DCE. There is no applicable acute WQS for Lakewood Gulch, and no applicable WQS of either kind for McIntyre Gulch. 1,1-DCE was detected in every influent sample and none of the effluent samples. The highest influent concentration detected was 2.8 μ g/L, with a median influent concentration of 1.9 μ g/L. Effluent samples are summarized in Table 2. Based on this information, reasonable potential to cause or contribute to an exceedance of the WQS does not exist. To avoid antibacksliding concerns, the previous permit limits of 7 μ g/L will be retained in the Permit. However, as it is based on a chronic WQS, the permit limit will be changed from a daily maximum limit to a 30-day average limit. This change does not affect the permitted overall loading. Additionally, the Permit only requires monthly sampling. A monthly sampling frequency does not allow distinction between monthly and daily limits *of the same value* when reporting on a monthly basis (i.e., the monthly reported value would be based on an average of one sample, whereas the daily reported value would be based on the highest of one sample). Assuming the Permittee samples no more often than the required frequency, their single monthly sample would either meet – or exceed – either limit. However, this change is further discussed in the anti-backsliding section (section 6.8).

³ U.S. EPA. Risk Evaluation for 1,1-Dichloroethane. https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/risk-evaluation-11-dichloroethane

6.5.4 1,1,1-trichloroethane (1,1,1-TCA)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 200 μ g/L for 1,1,1-TCA. There is no applicable acute WQS for Lakewood Gulch, and no applicable WQS of either kind for McIntyre Gulch. 1,1,1-TCA was not detected in any influent or effluent sample. Based on this comparison, reasonable potential to cause or contribute to an exceedance of the WQS does not exist. To avoid anti-backsliding concerns, the previous permit limits of 200 μ g/L will be retained in the Permit. However, as it is based on a chronic WQS, the permit limit will be changed from a daily maximum limit to a 30-day average limit. This change does not affect the permitted overall loading. Additionally, the Permit only requires monthly sampling. A monthly sampling frequency does not allow distinction between monthly and daily limits *of the same value* when reporting on a monthly basis (i.e., the monthly reported value would be based on an average of one sample, whereas the daily reported value would be based on the highest of one sample). Assuming the Permittee samples no more often than the required frequency, their single monthly sample would either meet – or exceed – either limit. However, this change is further discussed in the antibacksliding section (section 6.8).

6.5.5 1,1,2-TCA

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 2.7 μ g/L and an acute WQS for Lakewood Gulch of 9,400 μ g/L for 1,1,2-TCA. The applicable WQS for McIntyre Gulch for this compound is 9,400 μ g/L (acute only). Although not sampled for at the Facility, at the other permitted facility at the DFC treating the same plume (closer to the source, so likely higher concentration), 1,1,2-TCA was not detected above the reporting limit in any influent or effluent sample (out of 28 samples). Reporting limits ranged from 1 to 4 μ g/L, with a majority of the samples using a 1 μ g/L reporting limit. Based on this comparison, reasonable potential to cause or contribute to an exceedance of this WQS does not exist, and effluent limitations and monitoring will not be required in the Permit.

6.5.6 1,2-DCA

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 0.38 μ g/L and an acute WQS for Lakewood Gulch of 118,000 μ g/L for 1,2-DCA. The applicable WQS for McIntyre Gulch for this compound are 20,000 μ g/L (chronic) and 118,000 μ g/L (acute). Although not sampled for at the Facility, at the other permitted facility at the DFC treating the same plume (closer to the source, so likely higher concentration), 1, 2-DCA was not detected above the reporting limit in any influent or effluent sample (out of 28 samples). Reporting limits ranged from 1 to 4 μ g/L, with a majority of the samples using a 1 μ g/L reporting limit. Based on this, reasonable potential to cause or contribute to an exceedance of this WQS does not exist, and effluent limitations and monitoring will not be required in the Permit.

6.5.7 1,2-DCE (cis)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 70 μ g/L for cis-1,2-DCE. There is no applicable acute WQS for Lakewood Gulch, and no applicable WQS of either kind for McIntyre Gulch. Cis-1, 2-DCE was detected in all influent samples, and approximately 7% of the effluent samples. The highest influent concentration was 1.2 μ g/L, with a median influent

concentration of 1.1 μ g/L. Effluent samples are summarized in Table 2. Based on this comparison, reasonable potential to cause or contribute to an exceedance of the WQS does not exist. To avoid anti-backsliding concerns, the previous permit limits of 70 μ g/L will be retained in the Permit. However, as it is based on a chronic WQS, the permit limit will be changed from a daily maximum limit to a 30-day average limit. This change does not affect the permitted overall loading. Additionally, the Permit only requires monthly sampling. A monthly sampling frequency does not allow distinction between monthly and daily limits *of the same value* when reporting on a monthly basis (i.e., the monthly reported value would be based on an average of one sample, whereas the daily reported value would be based on the highest of one sample). Assuming the Permittee samples no more often than the required frequency, their single monthly sample would either meet – or exceed – either limit. However, this change is further discussed in the anti-backsliding section (section 6.8).

6.5.8 1,2-DCE (trans)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 100 μ g/L for trans-1,2-DCE. There is no applicable acute WQS for Lakewood Gulch, and no applicable WQS of either kind for McIntyre Gulch. Although not sampled for at the Facility, at the other permitted facility at the DFC treating the same plume (closer to the source, so likely higher concentration), trans-1, 2-DCE was not detected above the reporting limit in any influent or effluent sample (out of 28 samples). Reporting limits ranged from 1 to 4 μ g/L, with a majority of the samples using a 1 μ g/L reporting limit. Based on this, reasonable potential to cause or contribute to an exceedance of the WQS does not exist, and effluent limitations and monitoring will not be required in the Permit.

6.5.9 1,4-dioxane

1,4-dioxane (often just called dioxane) is used as a stabilizer for chlorinated solvents such as 1,1,1-TCA and TCE. It is a probable human carcinogen. It is completely miscible in water, and thus tends to concentrate and persist in water plumes. The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 0.35 µg/L for 1,4-dioxane. There is no applicable acute WQS for Lakewood Gulch, and no applicable WQS of either kind for McIntyre Gulch. Test methods for 1,4-dioxane exhibit a large range of detection and reporting limits, so although measured concentrations are often below detection limits, the concentrations in the influent to the Facility are typically between 5 and 10 μ g/L, which is approximately 15 to 30 times higher than the adopted WQS. The Facility has only taken a few 1,4-dioxane samples of the effluent, but those values have been basically the same as the influent values (for example, the January 2023 sample provided to the EPA result was 7.2 μ g/L in the influent and 7.2 μ g/L in the effluent), suggesting that the current treatment system may not be capable of effectively removing 1,4-dioxane. Due to the known presence of the compound in the influent, the observed concentrations in the influent and effluent, the mixing calculations provided below, and the ratio of the highest detected sample in the influent to the relevant WQS, there is reasonable potential to cause or contribute to an exceedance of this WQS, and effluent limitations will be required in the Permit.

Because Lakewood Gulch has a WQS for 1,4-dioxane, and it is several miles downstream of the discharge before it applies, the EPA has considered what is basically a dilution allowance in McIntyre Gulch while developing the permit limit for this pollutant. The dilution allowance will ensure that the 1,4-dioxane concentration in McIntyre Gulch is reduced to 0.35 µg/L prior to

entering Lakewood Gulch, so that no WQS exceedances will occur in Lakewood Gulch (i.e., not even a small mixing zone at the confluence).

Several factors come into play when determining the amount of the available assimilative capacity (dilution) that may be used to calculate WQBELs. Some of these include: presence of other dischargers in the vicinity; the presence of a water diversion downstream of the discharge (in the mixing zone); the need to provide a zone of passage for aquatic life; the likelihood of bioaccumulation of toxins in fish or wildlife; habitat considerations such as fish spawning or nursery areas; the presence of threatened and endangered species; potential for human exposure through drinking water or recreation; the possibility that aquatic life will be attracted to the effluent plume; the potential for adverse effects on groundwater; and the toxicity or persistence of the substance discharged.

In this case, there is another discharger immediately upstream of the Facility that discharges 1,4dioxane (Building 52A Treatment Plant; CO-0034860). The other permitted dischargers on the DFC are either intermittent or stormwater discharges (or both), and do not consider the further downstream Lakewood Gulch in their analysis; these will not be considered in the dilution allowance analysis. The discharge has approximately two miles to mix before it reaches Lakewood Gulch. 1,4-dioxane degrades in the presence of sunlight, but even at an assumed slow flow rate of one foot per second, the flow time for the two miles downstream to Lakewood Gulch is approximately three hours – not enough time to definitively state that photodegradation would occur year-round. There is no aquatic life based WQS in McIntyre Gulch, so it is assumed that effects on aquatic life will be minimal. The EPA also assumes that the amount of 1,4-dioxane in the upstream segment is at or near zero – 1,4-dioxane is rare in the environment and in this case comes from a specific source (i.e., the waste tank at Building 52) at the DFC.

Based on this, the EPA has allocated 100% of the available streamflow in McIntyre Gulch for the dilution allowance (to clarify – no WQS for 1,4-dioxane applies in McIntyre Gulch itself), but no other fate and transport considerations will be used when evaluating reasonable potential for 1,4-dioxane to affect Lakewood Gulch. The dilution allowance will be issued as a "shared" allowance for coordinated individual permits, and it will apply equally to both the Downing Reservoir Groundwater Treatment System Permit (CO-0035033) and the Building 52A Treatment Plant (CO-0034860).

The dilution allowance is calculated using a simple mass balance mixing equation as follows. The Facility flow (Q_d) is calculated by adding the average daily discharge permit limit for both facilities (0.043 mgd + 0.029 mgd = 0.072 mgd). The upstream critical low flow (Q_s) is the low flow from McIntyre Gulch converted to mgd (0.2 cfs = 0.129 mgd). The upstream concentration (C_s) is assumed to be zero. The well-mixed downstream concentration (C_r) is set to the state of Colorado's WQS of 0.35 µg/L. When applied to the simple mixing equation, the resulting critical discharge concentration (C_d) is 0.98 µg/L (Table 3):

Parameter	Q₅ (mgd)	Q _d (mgd)	Q _r = Q _s +Q _d (mgd)	Cs (µg/L)	C _r (µg/L)	C _d (µg/L)
1,4-dioxane	0.129	0.072	0.201	0	0.35	0.98
TCE	0.129	0.072	0.201	0	2.5	6.99

Table 3. Mixing Calculation for 1,4-Dioxane and TCE

Therefore, the final effluent limit for 1,4-dioxane in the Permit will be 0.98 μ g/L. Because this is a new limit and the Facility may have to upgrade their treatment system to meet it, a compliance schedule has been developed to provide time to achieve this. The compliance schedule is further discussed in section 8.

6.5.10 Benzene and BTEX (benzene, toluene, ethylbenzene, and xylene)

The contaminant plume is associated with a known chlorinated organic compound mixture from a specific leaking underground storage tank. The leaking underground storage tank did not contain petroleum or gasoline-based products, and no benzene or BTEX constituents were found in the contaminated groundwater at reportable levels. The 1995 report mentions a few scattered 'hits' of toluene and xylenes, and they were listed as "potentially present" in the first permit application in 2001; these may be the reasons these limits were included in previous permits.

The state of Colorado has adopted chronic WQS for Lakewood Gulch of 2.2 µg/L for benzene, 510 µg/L for toluene, 530 µg/L for ethylbenzene, and 10,000 µg/L for xylenes (total). The state of Colorado has adopted acute WQS for both Lakewood Gulch and McIntyre Gulch of 5,300 µg/L for benzene, 17,500 µg/L for toluene, and 32,000 µg/L for ethylbenzene. Regardless, an analysis of current data shows that out of the past six years' worth of data (i.e., all data reviewed), there has never been a detection of any BTEX compound in the influent or effluent. Furthermore, there is no reason to expect that these compounds would be present based on the known characterization of the leaking underground storage tank. Based on this, reasonable potential to cause or contribute to an exceedance of the WQS does not exist, and water quality based effluent limitations will not be required in the Permit. Note that the EPA is removing the technology based effluent limits for benzene and BTEX. Removal of these effluent limits triggers backsliding concerns; this is further discussed in section 6.8.

6.5.11 Chloroethane (ethyl chloride):

The state of Colorado has not adopted a WQS for chloroethane. Chloroethane is generally considered the least toxic of the chloroethanes, and is used as a prescription medication for local anesthetic/pain relief uses. Although not sampled for at the Facility, at the other permitted facility at the DFC treating the same plume (closer to the source, so likely higher concentration), chloroethane has never been detected above the reporting limit in either the influent or the effluent (out of 28 samples). Based on this, reasonable potential to cause or contribute to an exceedance of a WQS does not exist, and effluent limitations and monitoring will not be required in the Permit.

6.5.12 Oil and Grease

An oil and grease limit of 10 mg/L daily maximum was included in the previous permit, based on a case-by-case TBEL. The Facility has never reported any observed oil and grease in their effluent (Table 2). The state of Colorado has adopted a narrative "free from films on surface/deposits on shorelines" narrative water quality criterion found at Colorado Regulation 31.11(1)(a)(vi). The dual approach of a 10 mg/L numeric limit combined with frequent visual observations of the discharge is a common practice in permits issued by the EPA Region 8. For these reasons, the EPA has determined the existing combination of limits for oil and grease, as applied to discharge monitoring, adequately protects this narrative WQS in the receiving waters, and it will be retained in the Permit.

6.5.13 pH

A pH range of 6.5-9.0 was included in the previous permit, based on the applicable aquatic life water quality standard for McIntyre Gulch. This limit will be retained in the Permit.

6.5.14 Temperature

The state of Colorado has both a numeric and narrative WQS for temperature. Colorado's relevant numeric WQS for temperature in this stream segment is based on "Warm Stream Tier II" conditions, which state that the maximum weekly average temperature (MWAT) and daily maximum temperature (DM) from March to November are 27.5°C and 28.6°C, respectively. Additionally, the MWAT and DM from December through February are 13.8°C and 25.2°C, respectively. Colorado's narrative WQS is found in Colorado Regulation 38.5(1), and is a basic standard for all waters in the South Platte Basin. The narrative WQS states *"All waters...are subject to the following standard for temperature. (Discharges regulated by permits, which are within the permit limitations, shall not be subject to enforcement proceedings under this standard.)* Temperature shall maintain a normal pattern of diurnal and seasonal fluctuations with no abrupt changes and shall have no increase in temperature of a magnitude, rate, and duration deemed deleterious to the resident aquatic life."

Temperature monitoring data shows that over the past six years, the Facility's discharge temperature has ranged from 18.1 to 23.8°C, with an average value of 21.2°C. The December through February temperature range has been very similar, ranging from 19°C to 23.8°C, with an average value of 22.0°C. These are relatively moderate temperatures with low variability, as would be expected of a groundwater discharge. Groundwater tends to moderate surface temperatures year-round because it is typically cooler than ambient surface temperatures in the summer and warmer than ambient surface temperatures in the winter. Furthermore, the Facility's monitoring point is approximately 200 meters upstream from McIntyre Gulch. At a generic three feet per second flow velocity in the storm sewer system, this provides approximately three to four minutes for the discharged effluent to mix with other storm sewer water and stabilize with ambient temperature conditions in the storm sewer system prior to reaching McIntyre Gulch.

Based on DMR data summarized in Table 2, temperature in the Facility's discharge has remained below both DM values, as well as the March to November MWAT. Regarding the December through February MWAT, the Facility's discharge is above that value. However, considering the

travel time before it reaches McIntyre Gulch – in ambient winter conditions that time of year, and the mixing/dilution that occurs in McIntyre Gulch (approximately 4.5:1 dilution ratio), the EPA finds that reasonable potential for the discharge to cause or contribute to an exceedance of the state's numeric or narrative WQS does not exist, and effluent limitations will not be required in the Permit. Temperature monitoring will still be required, and reasonable potential for temperature will be re-assessed in the future. The Facility may be upgrading their treatment system, and monitoring will be important to see if the new treatment process introduces more heat or variability into the wastewater stream.

6.5.15 Tetrachloroethene (PCE)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 5 μ g/L for PCE and an acute WQS for Lakewood Gulch of 5,280 μ g/L for PCE. The applicable WQS for McIntyre Gulch for this compound are 840 μ g/L (chronic) and 5,280 μ g/L (acute). Although not sampled for at the Facility, at the other permitted facility at the DFC treating the same plume (closer to the source, so likely higher concentration), PCE was detected present in 50% of the influent samples (with reporting limits ranging from 1 μ g/L to 4 μ g/L), and was not detected in any of the 14 effluent samples using a reporting limit of 1 μ g/L (out of 28 samples total). The highest concentration detected in the influent was 2.25 μ g/L. Due to the existing point source controls (i.e., existing treatment to effectively remove other chlorinated VOCs), the low variability of the influent and effluent concentrations, and the ratio of the highest detected sample to the relevant WQS, reasonable potential for the discharge to cause or contribute to an exceedance of this WQS does not exist, and effluent limitations and monitoring will not be required in the Permit.

6.5.16 Total Suspended Solids (TSS)

The previous permit contained a 30-day average TSS limit of 30 mg/L, based on a case-by-case TBEL. The Facility's median discharge value over the past six years has been at non-detect levels, with a maximum value of 17 mg/L (Table 2). The state of Colorado has adopted a narrative "free from settleable deposits" narrative water quality criterion found at Colorado Regulation 31.11(1)(a)(i). Due to the widespread use of some form of TSS controls throughout the region and state – many of which are centered around 30 mg/L – the EPA has determined the existing limit adequately protects this narrative WQS, and it will be retained in the Permit.

6.5.17 Trichloroethene (TCE)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 2.5 μ g/L and an acute WQS for Lakewood Gulch of 45,000 μ g/L for TCE. Colorado Regulation Number 31 (section 31.11 Table B, footnote 3) states that the "Water + Fish" value of 2.5 μ g/L for TCE is "applicable to all Class 1 aquatic life segments which also have a water supply classification." This includes Lakewood Gulch (see section 5) as of its reclassification in 2020. This WQS was not considered in previous permit issuances (prior to the reclassification). The current daily maximum effluent limit value of 5 μ g/L was based on meeting the water supply criteria at end of pipe. The applicable WQS for McIntyre Gulch for this compound are 21,900 μ g/L (chronic) and 45,000 μ g/L (acute).

TCE was detected present in every influent sample, and approximately 92% of the effluent samples. The highest influent concentration detected was 22 μ g/L, with a median influent

concentration of 15.5 μ g/L. Effluent samples are summarized in Table 2. Due to the known presence of the compound in the influent, and the ratio of the highest detected sample in the influent to the relevant WQS, there is reasonable potential to cause or contribute to an exceedance of this chronic WQS, and effluent limitations will be required in the Permit.

Since the 2.5 μ g/L chronic standard applies specifically to Lakewood Gulch, which is several miles downstream of the actual discharge, the EPA has considered what is basically a dilution allowance in McIntyre Gulch while developing the permit limit for this pollutant. The dilution allowance will ensure that the TCE concentration in McIntyre Gulch is reduced below 2.5 μ g/L prior to entering Lakewood Gulch, so that no WQS exceedances will occur in Lakewood Gulch (i.e., not even a small mixing zone at the confluence).

Several factors come into play when determining the amount of the available assimilative capacity (dilution) that may be used to calculate WQBELs. Some of these include: presence of other dischargers in the vicinity; the presence of a water diversion downstream of the discharge (in the mixing zone); the need to provide a zone of passage for aquatic life; the likelihood of bioaccumulation of toxins in fish or wildlife; habitat considerations such as fish spawning or nursery areas; the presence of threatened and endangered species; potential for human exposure through drinking water or recreation; the possibility that aquatic life will be attracted to the effluent plume; the potential for adverse effects on groundwater; and the toxicity or persistence of the substance discharged.

In this case, there is another discharger immediately upstream of this facility that discharges TCE (Building 52A Treatment Plant; CO-0034860). The other permitted dischargers on the DFC are either intermittent or stormwater discharges (or both), and do not consider the further downstream Lakewood Gulch in their analysis; these will not be considered in the dilution allowance analysis. The discharge has approximately two miles to mix before it reaches Lakewood Gulch. TCE degrades in the presence of sunlight, but even at an assumed slow flow rate of one foot per second, the flow time for the two miles downstream to Lakewood Gulch is approximately 3 hours – not enough time to definitively state that photodegradation would occur year-round. The EPA also assumes that the amount of TCE in the upstream segment is at or near zero – TCE is rare in the environment and in this case comes from a specific leaking tank at the DFC.

Based on this, the EPA has allocated 100% of the available streamflow in McIntyre Gulch for the dilution allowance (to clarify – there is no reasonable potential to cause or contribute to an exceedance of the aquatic life based WQS for TCE that apply to McIntyre Gulch itself), but no other fate and transport considerations will be given when evaluating reasonable potential for TCE to affect Lakewood Gulch. The dilution allowance will be issued as a "shared" allowance for coordinated individual permits, and it will apply equally to both the Downing Reservoir Groundwater Treatment System (CO-0035033) and the Building 52A Treatment Plant (CO-0034860).

The dilution allowance is calculated using a simple mass balance mixing equation as follows. The Facility flow (Q_d) is calculated by adding the average daily discharge permit limit for both facilities (0.043 mgd + 0.029 mgd = 0.072 mgd). The upstream critical low flow (Q_s) is the low flow from McIntyre Gulch converted to mgd (0.2 cfs = 0.129 mgd). The upstream concentration (C_s) is assumed to be zero. The well-mixed downstream concentration (C_r) is set to the state of

Colorado's WQS of 2.5 μ g/L. When applied to the simple mixing equation, the resulting critical discharge concentration (C_d) is 6.99 μ g/L (Table 3).

Since 6.99 µg/L is greater than the previous permit limit, the previous permit limit will achieve the WQS in Lakewood Gulch, and no more stringent limits are necessary. However, since it is based on a chronic WQS, the previous permit limit will be changed from a daily maximum limit to a 30-day average limit. This change does not affect the permitted overall loading. Additionally, the Permit only requires monthly sampling. A monthly sampling frequency does not allow distinction between monthly and daily limits of the same value when reporting on a monthly basis (i.e., the monthly reported value would be based on an average of one sample, whereas the daily reported value would be based on the highest of one sample). Assuming the Permittee samples no more often than the required frequency, their single monthly sample would either meet – or exceed – either limit. However, this change is further discussed in the anti-backsliding section (section 6.8).

6.5.18 Vinyl chloride (chloroethene)

The state of Colorado has adopted a chronic WQS for Lakewood Gulch of 0.023 μ g/L for vinyl chloride (chloroethene). Colorado Regulation No. 31 (31.11 Table B, footnote 3) states that the "Water + Fish" value of 0.023 μ g/L for vinyl chloride (chloroethene) is "applicable to all Class 1 aquatic life segments which also have a water supply classification." This includes Lakewood Gulch (see section 5) as of its reclassification in 2020. This WQS was not considered in previous permit issuances (prior to the reclassification). There is no applicable WQS for McIntyre Gulch for this compound.

Vinyl chloride (chloroethene) has not been detected in any of the influent or effluent samples. Based on this information, reasonable potential to cause or contribute to an exceedance of the WQS does not exist. To avoid anti-backsliding concerns, the previous permit limits of $2 \mu g/L$ will be retained in the Permit. However, since it is based on a chronic WQS, the previous permit limit will be changed from a daily maximum limit to a 30-day average limit. This change does not affect the permitted overall loading. Additionally, the Permit only requires monthly sampling. A monthly sampling frequency does not allow distinction between monthly and daily limits of the same value when reporting on a monthly basis (i.e., the monthly reported value would be based on an average of one sample, whereas the daily reported value would be based on the highest of one sample). Assuming the Permittee samples no more often than the required frequency, their single monthly sample would either meet – or exceed – either limit. However, this change is further discussed in the anti-backsliding section (section 6.8).

6.5.19 Whole Effluent Toxicity (WET)

Many toxic pollutants have cumulative effects on aquatic organisms that cannot be detected by individual chemical testing. However, laboratory tests can measure toxicity directly by exposing living organisms to the wastewater and measuring their responses. Because these tests measure the aggregate toxicity of the whole effluent, this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

This groundwater plume is contaminated with multiple chlorinated solvents, and associated waste products and stabilizers. Most of these are considered toxics, and the state of Colorado has not

adopted WQS for several of them. Thus, there is no clear indicator that toxicity would not be present below a certain numeric value in many cases. Due to bioaccumulation of chemicals and toxicity in aquatic organisms, the potential for aggregate effects, and persistence of the chemicals in the discharge, the EPA has determined that reasonable potential exists to violate the state of Colorado "free from toxics" narrative water quality criterion found at Colorado Regulation 31.11(1)(a)(iv). Therefore, the acute WET permit limit and the requirement to perform acute WET testing are being retained in the Permit. See section 7.2.11 of this document and section 5 of the Permit for more information on WET testing requirements.

6.6 Final Effluent Limitations

Applicable TBELs and WQBELs were compared, and the most stringent of the two was selected for the following effluent limits (Table 4).

Effluent Characteristic	30-Day Average Effluent Limitations <u>a</u> /	Daily Maximum Effluent Limitations <u>a</u> /	Limit Basis <u>b</u> /
Flow, mgd	0.043	0.072	WQBEL
1,1-Dichloroethene (1,1-DCE), μg/L	7.0	report only	TBEL
1,1,1-Trichloroethane (1,1,1- TCA), μg/L	200	report only	TBEL
cis-1,2-Dichloroethene (cis-1,2- DCE), μg /L	70	report only	TBEL
1,4-dioxane, μg/L	0.98 <u>c</u> /, <u>d</u> /	report only	WQBEL
Oil and Grease, mg/L	N/A	10	TBEL/WQBEL
Total Suspended Solids (TSS), mg/L	30	report only	TBEL
Trichloroethene (TCE), μg/L	5.0	report only	TBEL
Vinyl Chloride (chloroethene), µg/L	2.0	report only	TBEL
1,1-Dichloroethane (1,1-DCA), μg/L	report only	report only	N/A
Benzene, μg/L	report only	report only	N/A
BTEX, μg/L	report only	report only	N/A
Total Phosphorus, mg/L	report only	report only	N/A
Temperature, °C	report only	report only	N/A
pH, standard units	Must remain of 6.5 to 9.0	in the range at all times	WQBEL
Whole Effluent Toxicity (WET) at 25°C, Acute	repor	t only	WQBEL

Table 4. Final Effluent Limitations for Outfall 001A

<u>a</u>/ See section 1 of the Permit for definition of terms.

- <u>b</u>/ WQBEL = Limitation based on water quality-based effluent limit; TBEL = Limitation based on technology based effluent limit
- <u>c</u>/ The reporting limit for 1,4-dioxane must be 1.0 μg/L or less. Since the reporting limit may be greater than the effluent limitation, a reported non-detect value less than or equal to 1.0 μg/L will be considered to be in compliance with the effluent limitation. See section 7.4 for further discussion on reporting non-detect values.
- <u>d</u>/ This permit limit becomes effective on [TBD 33 months after effective date of permit].

6.7 Antidegradation

An antidegradation review is not necessary for McIntyre Gulch, because the receiving stream is a use protected water, and use protected waters are not subject to antidegradation review. McIntyre Gulch flows approximately two miles from the discharge before joining Lakewood Gulch, and water quality standards (including antidegradation) for Lakewood Gulch have been considered in the development of the Permit. Lakewood Gulch is classified by CDPHE as a reviewable water. However, an antidegradation review and associated significance determination is necessary only for regulated activities that will have a new or increased water quality impact. Discharges from the Facility are existing, no increases in flow have been observed or are authorized, and no increases to effluent loading or quality are authorized. Therefore, an antidegradation review is not necessary.

6.8 Anti-Backsliding

Federal regulations at 40 CFR § 122.44(I)(1) require that when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit unless the circumstances on which the previous permit were based have materially and substantially changed since the time the Permit was issued and would constitute cause for permit modification or revocation and reissuance under 40 CFR § 122.62.

This permit renewal complies with anti-backsliding regulatory requirements. The EPA removed permit limits for benzene and BTEX, and these decisions are further discussed below. Additionally, the EPA changed several chlorinated organic compound limits from daily maximum limits to 30-day average limits. With the exception of these changes, all effluent limitations, standards, and conditions in the Permit are either equal to or more stringent than those in the previous permit.

As discussed in section 6.1, many of these changes were driven by the goal of more closely aligning permit conditions in the two permits issued at the DFC that treat the same plume using the same treatment technologies, and discharge to the same receiving water.

Changing several limits (1,1-DCE, 1,1,1-TCA, TCE, and vinyl chloride (chloroethene)) from daily maximum to 30-day average limits simply represents the correction of a mistaken interpretation of the applicable WQS. These limits are based entirely on human health based chronic criteria found in Colorado Regulation Number 31. Chronic criteria are typically implemented as 30-day average limits. The EPA has consistently interpreted CWA section 402(o)(1) to allow relaxation of WQBELs and effluent limitations based on state standards if the relaxation is consistent with the provisions of CWA section 303(d)(4) *or* if one of the exceptions in CWA section 402(o)(2) is met. These two provisions constitute independent exceptions to the prohibition against relaxation of effluent

limitations, and if either is met, relaxation is permissible. Regardless, CWA Section 303(d)(4) has two parts that apply to both attainment and non-attainment waters. McIntyre Gulch and Lakewood Gulch are both attainment waters (see section 6.3.3), and the relevant section simply states that relaxation of a limitation is allowed where the action is consistent with the state's antidegradation policy. In this case, the state WQS is being met (i.e., limits are implemented as end of pipe several miles upstream of the applicable WQS), and the removal of these daily maximum limits will have no impact on instream concentrations or antidegradation requirements, because the calculated chronic loading is not new or increased. The EPA also notes that the Facility samples monthly for most parameters, making little meaningful difference between a daily maximum limit and a 30-day average limit of the same value. For these reasons, removal of this limit satisfies any anti-backsliding concerns and is therefore consistent with CWA Section 303(d)(4)(B).

The limits for benzene and BTEX were based on a case-by-case TBEL using professional judgment. The original basis for these appears to be due to the 2001 permit application stating that both benzene and BTEX were "suspected present." However, there is neither anecdotal evidence nor observed evidence that either compound is present in this discharge. The contaminated plume is due to a chlorinated solvent leak, not a petroleum spill. Furthermore, there has never been a detection of benzene or BTEX in the influent or effluent at the Facility, and the known petroleum plumes at the DFC have been mapped out and are not present in the vicinity of the Facility or the leaking underground storage tank. 40 CFR § 122.44(I)(2)(i)(B)(1) provides that effluent limitations based on TBELs can be removed when new information is available. The decades of monitoring data for the influent and effluent for benzene and BTEX were not available when the permit was first issued and constitute "new information," and clearly show that these compounds are not present in the contaminated groundwater plume. 40 CFR § 122.44(I)(2)(ii) also contains limitations to backsliding, and states that permits cannot be issued to contain an effluent limitation which is less stringent than required by effluent guidelines in effect at the time of permit issuance, nor can one be issued if the implementation of the less stringent permit limits would result in a violation of a WQS under section 303 of the CWA. However, there are no ELGs associated with this industry type, and the permitted discharge will not violate any WQS (see section 6.5.10), so that exception is satisfied, and for these reasons, removal of these limits satisfies anti-backsliding concerns. It is also worth noting that the Facility will continue to treat for chlorinated solvents using a technology that incidentally readily removes benzene and BTEX as well, and the Permit will continue to require monitoring for these compounds for at least one more permit cycle as an added precaution.

7 MONITORING REQUIREMENTS

7.1 Outfall Locations

The Facility is relatively unique in that it discharges via a shared conveyance system (i.e., the DFC storm sewer system) that is not a Water of the United States, prior to discharging to McIntyre Gulch (which is a Water of the United States). Furthermore, the point at which the Facility discharges to the shared conveyance is inaccessible and/or unsafe. These factors add complexity to clearly identifying an outfall location and a monitoring location. The previous permit addressed this by establishing two outfall locations – 001A as the outfall to McIntyre Gulch as the Water of the U.S., and 001B as an internal monitoring point (see 40 CFR § 122.45(g)), and developed a Discharge Monitoring Report (DMR) for both.

While this was a reasonable way to tackle the issue, for this issuance, this process will be simplified. The Facility will have a single outfall – Outfall 001A – which is any discharge from the Facility to McIntyre Gulch – and is located at the point where the storm sewer system discharges to McIntyre Gulch (Figure 2 – this location is also referred to as DFC storm sewer outfall 14OUT3002C). There is no change to this outfall from the previous permit, as it is the appropriate location for an NPDES outfall. However, this issuance reconsiders the need to establish a separate internal monitoring point as an NPDES outfall.

There is no requirement that the effluent monitoring location be located *exactly* at the NPDES outfall location. The only requirement is that the effluent monitoring location must be located such that samples and measurements taken for the purpose of monitoring are representative of the monitored activity (40 CFR § 122.41(j)(1)). This means that sampling should be done prior to dilution or mixing with other, non-regulated waste streams. On a more practical note, monitoring locations should also be both easy and safe to access. Since the discharge may be diluted once it enters the DFC storm sewer system and mixes with Downing Reservoir discharges, and accessing sampling locations within the Downing Reservoir discharge structure could be impractical, the most appropriate monitoring location for the Facility's discharge is at the effluent sampling port located within the Facility. Thus, the established monitoring location - the sampling port at the Facility - is an ideal location for the representative monitoring to occur. The only change in this issuance is that this location will not have a separate NDPES Outfall ID. The samples taken at the monitoring location will be reported as the effluent for Outfall 001A. This will simplify the Facility's DMR process considerably - for the past six years, the Facility has been reporting a monthly "No Discharge" at Outfall 001A, because they are reporting all monitoring information for Outfall 001B. Additionally, this will clear up any confusion about where the actual outfall is, provide consistency between the two DFC permits, and it will tie in all of the Facility's reported values to the actual NPDES outfall (001A).

Therefore, this issuance will remove Outfall 001B from the Permit, clarify that the Permittee must collect effluent samples at the effluent sampling port in the Facility, and clarify that the Permittee must report those samples as discharges to Outfall 001A in their Discharge Monitoring Reports (DMRs).

7.2 Self-Monitoring Discussion

In this section, the EPA lays out the basis for assigning monitoring frequencies and types to the various pollutants in the Permit. The monitoring frequency should be sufficient to characterize the effluent quality and to detect events of noncompliance, considering the need for data and, as appropriate, the potential cost to the Permittee. All monitoring requirements are further discussed below.

The previous permit required monthly monitoring for most limited parameters. In general, the EPA Region 8 has determined that this frequency is appropriate for parameters with effluent limitations in the Permit, while parameters without effluent limits (i.e., "monitoring only" to better characterize the effluent) may be assigned a less frequent monitoring frequency such as quarterly or semi-annually. This is generally in line with the NPDES Permit Writer's Manual and other EPA guidance. Some of the site-specific factors considered in the decision on sample frequency include the predicted frequency of discharge (effectively continuous), nature of the effluent (remediation of

hazardous substances), variability of the influent and effluent (low – this is a long-term remediation project), location of the discharge (highly populated urban area), and treatment processes/chemicals used (complex).

7.2.1 Flow monitoring

This parameter is limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The Facility currently monitors flow using an inline meter that collects flow data continuously. The previous permit required the Facility to monitor effluent flow on a daily frequency using an instantaneous method. For the renewal, the EPA will require a daily frequency using a grab sample (which is equivalent to an instantaneous measurement and EPA's preferred terminology – see section 1 of the Permit for definitions). While only daily observations are required in the Permit, the EPA encourages the Facility to continue to collect flow data continuously – more flow measurements result in more accurate reporting of 30-day averages and daily maximum flows.

7.2.2 Chlorinated volatile organic compounds

These parameters are limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The previous permit required the Facility to monitor effluent for all chlorinated volatile organic compounds (including 1,1-DCA, 1,1-DCE, 1,1,1-TCA, TCE, and vinyl chloride [chloroethene]) on a monthly frequency using a grab sample. This monthly frequency and a grab sample type will be retained in the Permit. A grab sample type is appropriate for long-term remediation projects with low influent and effluent variability, and for volatile organic compounds due to the high rate of volatilization from aqueous solutions.

7.2.3 1,4-dioxane

This parameter is limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The previous permit did not require the Facility to monitor effluent for 1,4-dioxane. The Permit will implement a monthly monitoring frequency using a grab sample. A monthly frequency is appropriate for parameters that have effluent limitations, and a grab sample type is appropriate for long-term remediation projects with low influent and effluent variability, and for volatile organic compounds due to the high rate of volatilization from aqueous solutions.

Additionally, because the 1,4-dioxane limits are being implemented with respect to downstream effects on Lakewood Gulch, the Permit will require semi-annual monitoring of McIntyre Gulch. This will help inform the actual loading into Lakewood Gulch, help inform future permitting conditions, and help justify the dilution provided in the Permit. The monitoring location in McIntyre Gulch is identified in Table 1, and monitoring requirements for McIntyre Gulch are shown in Table 6.

The Permit will also specify a required test method for 1,4-dioxane. 1,4-dioxane is somewhat unique in that it does not have an approved method for CWA purposes – i.e., it is not listed in 40 CFR § 136.3. Therefore, 40 CFR § 122.44(i)(1)(iv)(B) indicates that the Permit must specify an appropriate test procedure: In the case of pollutants or pollutant parameters for which there are no approved methods under 40 CFR part 136 or methods are not otherwise required under 40 CFR chapter I, subchapter N or O, monitoring shall be conducted according to a test procedure specified in the permit for such pollutants or pollutant parameters.

The EPA has reviewed several test procedures available for 1,4-dioxane and discusses the details of each below.

- Methods 624.1/1624: Methods 624.1 and 1624 are similar methods, but method 1624 is specifically designed for analyzing pollutants related to the Clean Water Act. They both use a purge and trap method to collect 1,4-dioxane, and then separate it using gas chromatography, and analyze it using mass spectrometry. While both methods are listed in 40 CFR Part 136 Appendix A as *potential* ways to test for 1,4-dioxane, neither has been validated for this compound, and neither is approved. Due to the unique properties of 1,4-dioxane (e.g., miscibility in water, etc.), the reporting limits for this method are generally higher than other methods the lab reports reviewed indicate RLs that vary between 10 and 40 µg/L. Another Permittee at the DFC has been analyzing 1,4-dioxane samples using both methods 625 (similar to 624) and methods 522 for the past three years, and their data is showing that method 522 is consistently measuring higher concentrations than method 625.
- Method 522: This is a Safe Drinking Water Act (SDWA) approved method. This method uses solid phase extraction to recover material for testing. As such, it has a longer holding time than the other methods, and is capable of analyzing for low concentrations of compounds such as 1,4-dioxane, but is also designed specifically for drinking water, which tends to be clean and relatively free of compounds that may cause interference. Fewer labs are certified for this method, and because of the interference issues, some certified labs hesitate to run this method on wastewater samples. This method also tends to be the most expensive of the methods discussed here. Lab reports reviewed indicate RLs that can be <1 μ g/L.
- Method 8270-SIM: This is a method typically used for sampling hazardous waste. It uses selected ion monitoring (SIM) to focus on a specific narrow range of compounds. It relies on solvent extraction and evaporative concentration, rather than purging, to obtain the sample, and thus can achieve lower RLs. However, there can be concerns about losses during the extraction and concentration steps, especially with the high miscibility of 1,4-dioxane in water. This method is used by the Permittee for other monitoring requirements at the DFC, and the lab reports reviewed indicate RLs that can be <1 μg/L.

After review of all of these methods and some supporting data, the EPA has chosen method 522 as the preferred method, with method 8270-SIM as an alternate, and will require 1,4-dioxane testing using method 522 in the Permit. The EPA made this choice based primarily on the fact that 522 is a SDWA approved method, it has low reporting limits, and the Facility's wastewater is cleaner than most typical wastewater samples (e.g., discharges from municipal sewage plants often contain higher organic content and total suspended solids). The alternate method will be a backup in case circumstances change with respect to the availability and appropriateness of method 522.

7.2.4 Benzene

The previous permit required the Facility to monitor effluent benzene on a monthly frequency using a grab sample. Because the limits for benzene have been removed – and because benzene has never been detected in either the influent or the effluent of the Facility – the EPA is going to

reduce the frequency of monitoring to quarterly. A grab sample type is appropriate for volatile organic compounds due to the high rate of volatilization from aqueous solutions. The EPA removed permit limits associated with this compound during the permit renewal process (see section 6.2.1) and will require continued monitoring for another permit cycle to verify that no changes to influent water quality have occurred that would necessitate the need for limits.

7.2.5 BTEX

The previous permit required the Facility to monitor effluent BTEX on a monthly frequency using a grab sample. Because the limits for BTEX have been removed – and because no BTEX compounds have ever been detected in either the influent or the effluent of the Facility – the EPA is going to reduce the frequency of monitoring to quarterly. A grab sample type is appropriate for volatile organic compounds due to the high rate of volatilization from aqueous solutions. The EPA removed permit limits associated with this compound during the permit renewal process (see section 6.2.1) and will require continued monitoring for another permit cycle to verify that no changes to influent water quality have occurred that would necessitate the need for limits.

7.2.6 Oil and Grease

This parameter is limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The previous permit required the Facility to monitor effluent oil and grease on a monthly frequency using a visual inspection, followed by an immediate grab sample if any oil and grease were observed. This protocol is being retained in the Permit, but the frequency of visual inspection will be increased to weekly. A visual inspection is simple to perform, and part of the basic operation and maintenance of a Facility such as this (see sections 6.2 and 6.3 of the Permit). Weekly visual assessments are also in line with other similar permits issued by the EPA in Region 8. A grab sample is appropriate because oil and grease is not amenable to compositing unless composited in the lab.

7.2.7 pH

This parameter is limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The previous permit required the Facility to monitor effluent pH on a monthly frequency using a grab sample. This monthly frequency and a grab sample type will be retained in the Permit. Note that pH samples must be analyzed within 15 minutes of collection and are not amenable to compositing. For this reason, most facilities use an *in situ* meter, such as a pH meter, to measure it directly in the field.

7.2.8 Temperature

The previous permit required the Facility to monitor effluent temperature on a quarterly frequency using a grab sample, although the Permittee has been reporting monthly temperatures. The frequency requirement will be increased to monthly, and a grab sample type will be retained in the Permit. Temperature samples are simple and inexpensive to collect and can verify that numeric and narrative WQS are being achieved. Note that temperature samples must be analyzed within 15 minutes of collection and are not amenable to compositing. For this reason, most facilities use an *in situ* meter, such as a calibrated thermometer, to measure it directly in the field.

7.2.9 Total Suspended Solids (TSS)

This parameter is limited in the Permit, and therefore monitoring is required (40 CFR § 122.44(i)(1)(i)). The previous permit required the Facility to monitor effluent TSS on a monthly frequency using a grab sample. This monthly frequency and a grab sample type will be retained in the Permit. Grab samples are appropriate where the effluent quality has demonstrated low variability.

7.2.10 Nutrients

The previous permit required the Facility to monitor the effluent for total inorganic nitrogen and total phosphorus on a quarterly frequency using a grab sample. This quarterly frequency and a grab sample type will be retained in the Permit for phosphorus, and dropped for nitrogen. The state of Colorado is planning to adopt a statewide numeric phosphorus WQS, and this information will be used to determine reasonable potential at a future permit issuance. There is no adopted WQS for total inorganic nitrogen, and groundwater dewatering discharges are not typically significant additional sources of nitrogen. Grab samples are allowable for parameters such as phosphorus, which can be composited but often require special handling procedures to do so.

7.2.11 Whole Effluent Toxicity (WET)

The previous permit required the Facility to monitor the effluent for whole effluent toxicity on a quarterly frequency using a grab sample. The frequency will be reduced to annually, and the sample type will remain a grab sample. The Permittee has demonstrated that there has been no toxicity in the effluent since data has been collected; this warrants a reduction in frequency. Grab samples are appropriate where the effluent quality demonstrates low variability.

Acute WET testing shall be performed on an annual basis by the Permittee for two species: *Ceriodaphnia dubia* and *Pimephales promelas*. Specific WET requirements are outlined in the Special Conditions section of the Permit (see section 5 of the Permit).

Hardness requirements for WET testing in the Permit were determined by the receiving water quality data in Lakewood Gulch (there was no available hardness data in McIntyre Gulch). Out of 56 hardness samples collected, the receiving water hardness ranges from approximately 180 to 300 mg/L, with a median value of 230 mg/L. Based on this, the dilution water used for the test shall be "hard" synthetic laboratory grade water, consistent with the EPA WET manual ("Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms", Fifth Edition, EPA-821-R-02-012, October 2002).

7.3 Self-Monitoring Requirements

Monitoring must be conducted according to test procedures approved under 40 CFR Part 136, as required in 40 CFR § 122.41(j), unless another method is required under 40 CFR subchapters N or O.

Effluent Characteristic	Monitoring Frequency	Sample Type <u>a</u> /	Data Value Reported on DMR <u>b</u> /
Flow, mgd c/	Daily	Grab	Daily Max.
	,		30-Day Avg.
Oil and Grease, visual <u>d</u> /	Weekly	Visual	Narrative
Oil and Grease, mg/L <u>d</u> /	Immediately if visual sheen detected	Grab	Daily Max.
1,1-Dichloroethane (1,1-DCA), μg/L	Monthly	Grab	Daily Max. 30-Day Avg.
1,1-Dichloroethene (1,1-DCE), μg/L	Monthly	Grab	Daily Max. 30-Day Avg.
1,1,1-Trichloroethane (1,1,1- TCA), μg/L	Monthly	Grab	Daily Max. 30-Day Avg.
cis-1,2-Dichloroethene (cis- 1,2-DCE), μg/L	Monthly	Grab	Daily Max. 30-Day Avg.
1,4-dioxane, μg/L <u>e</u> /	Monthly	Grab	Daily Max. 30-Day Avg.
pH, standard units <u>f</u> /	Monthly	Grab	Minimum Maximum
Temperature, °C <u>f</u> /	Monthly	Grab	Daily Max. 30-Day Avg.
Total Suspended Solids (TSS), mg/L	Monthly	Grab	Daily Max. 30-Day Avg.
Trichloroethene (TCE), μg/L	Monthly	Grab	Daily Max. 30-Day Avg.
Vinyl Chloride (chloroethene), µg/L	Monthly	Grab	Daily Max. 30-Day Avg.
Benzene, μg/L	Quarterly	Grab	Daily Max. 30-Day Avg.
BTEX, μg/L	Quarterly	Grab	Daily Max. 30-Day Avg.
Total Phosphorus, mg/L	Quarterly	Grab	Daily Max. 30-Day Avg.
Whole Effluent Toxicity (WET) at 25°C, Acute	Annually	Grab	Pass/Fail

Table 5. Monitoring and Reporting Requirements for Outfall 001A

<u>a</u>/ See section 1 of the Permit for definition of terms.

<u>b</u>/ Refer to the Permit for requirements regarding how to report data on the DMR.

<u>c</u>/ Flow measurements of effluent volume shall be made in such a manner that the Permittee can affirmatively demonstrate that representative values are being obtained. The average flow rate in million gallons per day (mgd) during the reporting period and the maximum flow rate observed, in mgd, shall be reported.

- d/ If a visible sheen or floating oil is observed in the discharge, a grab sample shall be taken immediately, analyzed and recorded in accordance with the requirements of 40 CFR Part 136. The concentration of oil and grease shall not exceed 10 mg/L in any sample (see Table 4).
- e/ All 1,4-dioxane samples shall be run using EPA method 522, unless otherwise agreed upon (see section 7.2.3, as well as section 7.2 of the Permit).
- f/ This sample must be analyzed within 15 minutes of collection per 40 CFR Part 136.

Table 6. Monitoring and Reporting Requirements for Monitoring Location RW01 (McIntyre Gulch)

Effluent Characteristic	Monitoring Frequency	Sample Type <u>a</u> /	Data Value Reported on DMR <u>b</u> /
1,4-dioxane, μg/L <u>c</u> /	Semi- Annually <u>d</u> /	Grab	Average Value

a/ See section 1 of the Permit for definition of terms.

b/ Refer to the Permit for requirements regarding how to report data on the DMR.

- c/ All 1,4-dioxane samples shall be run using EPA method 522, unless otherwise agreed upon (see section 7.2.3, as well as section 7.2 of the Permit).
- <u>d</u>/ Semi-annual monitoring must occur in the second and fourth quarters of each calendar year i.e., April June, and October December.

8 SPECIAL CONDITIONS

8.1 Receiving Stream Mixing Study

The basis for many of the effluent limits in the Permit are WQS applicable to Lakewood Gulch. However, Lakewood Gulch is not the direct receiving stream, and is approximately two miles downstream of the Facility's discharge. This creates a complex situation where, in the absence of mixing data and fate and transport modeling, many assumptions must be made to develop permit conditions based on these WQS – i.e., end of pipe limits in some cases, no allowance for mixing/dilution in Lakewood Gulch, assumption that all pollutants are transported to Lakewood Gulch, no other sources of these compounds in McIntyre Gulch, etc. Actual stream monitoring data may assist in minimizing the effects of and error associated with these assumptions – i.e., better determining how effluent and receiving water mix in McIntyre Gulch, and how and in what quantities these pollutants are delivered to Lakewood Gulch. Therefore, the Permittee will be required to collect receiving stream information that may be used to characterize fate and transport, and inform future permit requirements (Table 6). At the end of the permit cycle, this monitoring requirement may be removed.

The Permittee will be required to conduct monitoring at RW01 in McIntyre Gulch downstream of the DFC but prior to McIntyre Gulch joining Lakewood Gulch. It must be far enough downstream from the DFC that all DFC discharges are well mixed in McIntyre Gulch at the monitoring location. The EPA has chosen a site at Meadowlark Park approximately one mile downstream from the DFC (Table 1). The Permittee will be required to sample for 1,4-dioxane twice per year at the monitoring location. 1,4-dioxane is the least volatile and most miscible known organic pollutant in the Facility's discharge. It can therefore act as a conservative estimate of pollutant fate and transport in McIntyre Gulch.

As part of an effort to look at both EPA-issued NPDES permits treating this contaminated plume (NPDES ID CO-0035033 and CO-0034860) from a holistic watershed approach, the EPA is requiring both permittees to monitor McIntyre Gulch for 1,4-dioxane at the same location. The data collected will be reported in NetDMR by each permittee on a semi-annual frequency. Each permittee will monitor in offset quarters – the GSA will monitor in the second and fourth quarters of each calendar year.

8.2 Compliance Schedule for 1,4-dioxane

The Permit has a new final effluent limitation for 1,4-dioxane. This is based on an applicable WQS in downstream Lakewood Gulch. The Permittee currently treats volatile organic compounds using a basic settling/filtration/air-stripping system. While this type of system can be effective at removing most VOCs, it has demonstrated limited ability to remove 1,4-dioxane, and it is unlikely that the Permittee would be able to meet their permit limits with their current treatment system. Treatment for 1,4-dioxane is more complicated and will require additional steps such as advanced oxidation and bioremediation⁴. This water quality requirement is new since the previous permit was issued and will affect all permittees at the Denver Federal Center. The equipment and infrastructure at the Facility may be nearing the end of its lifespan, so the Permittee has indicated that they will likely completely overhaul the entire facility, rather than simply adding on additional treatment. Therefore, the upgrade process will take time to get the funding, plans, and allocations to build the Facility. For these reasons, the EPA has determined that a compliance schedule to meet this effluent limit is appropriate and has developed a compliance schedule that will result in attainment of the water quality based effluent limit *as soon as possible* (see 40 CFR § 122.47(a)).

The compliance schedule includes an enforceable sequence of interim milestones due at least every 12 months (Table 7).

Task	Timeline	Completion Date	Interim Requirement/Deliverable
Design Contractor Procurement	2 months	Two months from final permit effective date	Document task in records/no report submission required
Facility Planning Study/Preliminary Design	4 months	Six months from final permit effective date	Document task in records/no report submission required
Pilot Study	4 months	Ten months from final permit effective date	Document task in records/no report submission required
Preliminary Design Memo	1 month	Eleven months from final permit effective date	Submit preliminary design plans and recommended design

Table 7 Compliance			attan af 4 4 altana	
Table 7. Compliance	e Schedule to	or implementa	ation of 1,4-dioxa	ine Permit Limits

⁴ USEPA, 2017. Technical Fact Sheet – 1,4-Dioxane, November 2017.

https://19january2021snapshot.epa.gov/sites/static/files/2014-03/documents/ffrro_factsheet_contaminant_14-dioxane_january2014_final.pdf

Task	Timeline	Completion Date	Interim
TUSK	Thileine	completion bate	Requirement/Deliverable
			memo discussing results
			of pilot study.
		Sixtoon months from final	Document task in
Final Design Plan	5 months	Sixteen months nom mai	records/no report
		permit effective date	submission required
			Submit final design plan
Contractor Droguromont	2 months	Eighteen months from	and notify the EPA that a
Contractor Procurement		final permit effective date	contractor has been
			procured.
			Notify the EPA that
Construction	12 months	Thirty months from final	construction is complete
Construction	12 months	permit effective date	and process refinement
			has begun.
Process		Thirty three months from	Document task in
Refinement/Start-Up	3 months	final parmit offective date	records/no report
Period		final permit enective date	submission required
Final Effluent Limit Effective Date	-	Thirty three months from final permit effective date	Comply with final 1,4- dioxane effluent limit

9 REPORTING REQUIREMENTS

Reporting requirements are based on requirements in 40 CFR §§ 122.44, 122.48, and Parts 3 and 127. A discharge monitoring report (DMR) frequency of monthly was chosen, because the Facility samples primarily monthly, has been using a monthly reporting frequency for many years, and this frequency works well for them.

40 CFR § 121.41(I)(5) states, "Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this permit shall be submitted no later than 14 days following each schedule date." Due dates for compliance schedule reports are therefore required 14 days following the schedule date.

10 COMPLIANCE RESPONSIBILITIES AND GENERAL REQUIREMENTS

10.1 Inspection Requirements

On a weekly basis, unless otherwise modified in writing by the EPA, the Permittee shall inspect its treatment facility. The Permittee shall document the inspection, as required by the Permit. Inspections are required to regularly identify and resolve any issues that might interfere with proper operation and maintenance in accordance with 40 CFR § 122.41(e). The EPA requires weekly inspections for most NPDES-permitted facilities in Region 8.

10.2 Operation and Maintenance

40 CFR § 122.41(e) requires permittees to properly operate and maintain at all times all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Permittee to achieve compliance with the conditions of this permit. In addition to an operation and maintenance plan and regular facility inspections, consideration of staff and funding resources are important aspects of proper operation and maintenance. Consideration of staff and funding provide the Permittee with the necessary resources to operate and maintain a well-functioning facility. These requirements have been established in sections 6.3 of the Permit to help ensure compliance with the provisions of 40 CFR § 122.41(e).

11 ENDANGERED SPECIES CONSIDERATIONS

The Endangered Species Act of 1973 requires all Federal Agencies to ensure, in consultation with the U.S. Fish and Wildlife Service (FWS), that any Federal action carried out by the Agency is not likely to jeopardize the continued existence of any endangered species or threatened species (together, "listed" species), or result in the adverse modification or destruction of habitat of such species that is designated by the FWS as critical ("critical habitat"). See 16 U.S.C. § 1536(a)(2), 50 CFR Part 402. When a Federal agency's action "may affect" a protected species, that agency is required to consult with the FWS (formal or informal) (50 CFR § 402.14(a)).

The U.S. Fish and Wildlife Information for Planning and Conservation (IPaC) website (https://ecos.fws.gov/ipac/) was accessed on March 17, 2025, to determine federally listed Endangered, Threatened, Proposed and Candidate Species for the area near the Facility. The IPaC Trust Resource Report findings are provided below (Table 8). The designated area utilized was identified in the IPaC search and covers approximately 700 acres near the Facility and downstream along McIntyre Gulch past its confluence with Lakewood Gulch.

Species	Scientific Name	Species Status	Designated Critical Habitat
Piping plover	Charadrius melodus	Threatened	No critical habitat at this
Whooping Crane	Grus americana	Endangered	No critical habitat at this location
Pallid sturgeon	Scaphirhynchus albus	Endangered	No critical habitat at this location.
Monarch butterfly	Danaus plexippus	Proposed Threatened	No critical habitat at this location.
Suckley's Cuckoo	Rombus sucklaui	Proposed	No critical habitat at this
Bumble Bee	Bollibus suckieyi	Endangered	location.
Western Regal	Argynnis idalia	Proposed	No critical habitat at this
Fritillary	occidentalis	Threatened	location.
Ute ladies'-tresses	Spiranthes diluvialis	Threatened	No critical habitat at this location.

Table 8. IPaC Federally listed Threatened and Endangered Species

Species	Scientific Name	Species Status	Designated Critical Habitat
Western Prairie	Platanthera	Throatopod	No critical habitat at this
Fringed Orchid	praeclara	Inteateneu	location.

11.1 Biological Evaluation

Biological evaluations of the potential effects of the proposed action on the listed species and their critical habitat are provided below. These biological evaluations are based on information obtained from the IPaC site and knowledge regarding the proposed action.

The proposed action is reissuance of this NPDES permit. This is a continuation of existing operating conditions; no significant changes to habitat or discharge volumes or quality are planned or expected due to the reissuance of this permit. Since this is a groundwater remediation/treatment permit, there is no consumptive use of water and no water depletions will result from the Permit. Permit effluent limitations are protective of receiving water quality.

<u>Piping plover, Charadrius melodus</u> – This species is currently listed as threatened. This location is outside the critical habitat for this species, and IPaC notes that this species only needs to be considered if water related activities/use in the South Platte River Basin may affect listed species in Nebraska. Continuation of small groundwater remediation activities in the Denver metropolitan area will not affect populations in Nebraska. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Whooping Crane, Grus americana</u> – This species is currently listed as endangered. This location is outside the critical habitat for this species. Whooping Crane are unlikely to be found within the Denver Federal Center or immediately downstream of it. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Pallid sturgeon, Scaphirhynchus albus</u> – This species is currently listed as endangered. No critical habitat has been designated for this species, and IPaC notes that this species only needs to be considered if water related activities/use in the South Platte River Basin may affect listed species in Nebraska. Continuation of small groundwater remediation activities in the Denver metropolitan area will not affect populations in Nebraska. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Monarch butterfly, Danaus plexippus</u> – This species is currently listed as proposed threatened. No critical habitat has been designated for this species. This species prefers native prairie habitat and has specific obligate host plants (milkweed) that it needs for reproduction. There is no supporting habitat at the DFC. Additionally, discharges from groundwater remediation activities are not anticipated to affect it. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Suckley's Cuckoo Bumble Bee, Bombus suckleyi</u> – This species is currently listed as proposed endangered. No critical habitat has been designated for this species. This species prefers native meadows and forages a wide range of flowers. There is no supporting habitat at the DFC. Additionally, discharges from groundwater remediation activities are not anticipated to affect it. This is also a new listing and the FWS website indicates it will be updating and narrowing the mapped range of this species. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Western Regal Fritillary, Argynnis idalia occidentalis</u> – This species is currently listed as proposed threatened. No critical habitat has been designated for this species. This species prefers native prairie habitat and has specific host plants that it needs. There is no supporting habitat at the DFC. Additionally, discharges from groundwater remediation activities are not anticipated to affect it. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Ute ladies'-tresses orchid, Spiranthes diluvialis</u> – This species is currently listed as threatened. No critical habitat has been designated for this species. The Ute ladies'-tresses orchid typically occurs in riparian, wetland and seepy areas associated with old landscape features within historical floodplains of major rivers. They are also found in wetland and seepy areas near freshwater lakes or springs. Ute ladies'-tresses orchids are unlikely to be found in the disturbed urban setting of the DFC. Regardless, the Permit does not authorize changes to habitat that supports this species, nor are discharges from groundwater remediation activities anticipated to affect it. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.

<u>Western prairie fringed orchid, *Platanthera praeclara* – This species is currently listed as threatened. No critical habitat has been designated for this species, and IPaC notes that this species only needs to be considered if water related activities/use in the South Platte River Basin may affect listed species in Nebraska. Continuation of small groundwater remediation activities in the Denver metropolitan area will not affect populations in Nebraska. Based on this information, the EPA has determined that the reissuance of the Permit will have **no effect** on this species.</u>

Per a technical assistance discussion with the FWS on October 8, 2024, and the *Endangered Species Consultation Handbook* and the *Memorandum of Agreement Between EPA, FWS, and NMFS Regarding Enhanced Coordination Under the Clean Water Act and Endangered Species Act*, the "no effect" determinations above do not require further consultation with the FWS. During public notice of the Permit, FWS will be notified as an interested party.

12 NATIONAL HISTORIC PRESERVATION ACT REQUIREMENTS

Section 106 of the National Historic Preservation Act of 1996 (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The implementing regulations of the NHPA can be found at 36 CFR Part 800. An "undertaking," as defined at 36 CFR § 800.16(y), includes projects requiring a federal permit. Therefore, the issuance of this permit constitutes an undertaking. The first step in this analysis is to consider whether the undertaking has the potential to affect historic properties. See 36 CFR § 800.3(a). The EPA searched the National Register of Historic Places (https://www.nps.gov/subjects/nationalregister/database-research.htm) for historically significant properties in or near Lakewood, Colorado. Three buildings/structures on the DFC campus are listed on the NRHP. These three are identified below:

- The Denver & Intermountain Railroad Interurban No. 25 Railcar sits in Building 78 approximately 3,400 feet west of the Facility.
- The original Office of Civil Defense Emergency Operations Center is an underground bunker complex designed to withstand a nuclear blast and act as a base for federal operations during a nuclear war. It is entirely underground and lies approximately 2,300 feet west-southwest of the Facility.
- Building 710 (Defense Civil Preparedness Agency) is an underground bunker complex designed to withstand a nuclear blast and act as a base for federal operations during a nuclear war. It is entirely underground and lies approximately 3,400 feet southwest of the Facility.

Additionally, the EPA reached out to the GSA as part of this process. As the owner/operator of the DFC, the GSA regularly renovates and constructs buildings at the DFC, and as a federal agency are subject to the same NHPA requirements. The GSA reported that they were not aware of any other historic properties at the DFC, and that much of the DFC has been previously disturbed. The GSA also stated that, as the owner/operator of the DFC, they have an archeological monitor on-site during any ground disturbing activities at the DFC, and in the event anything is found they coordinate directly with the State Historic Preservation Office.

Considering that any potential construction will be limited to the immediate vicinity of the Facility and its nearby underground pipe network, and that day-to-day operations at the Facility are generally not the type of action with the potential to cause effects on external properties, the EPA has determined that this federal undertaking has no potential to cause effects on historic properties. The EPA will reach out to the State Historic Preservation Officer during public notice to solicit their input.

13 401 CERTIFICATION CONDITIONS

Colorado is the Clean Water Act (CWA) Section 401 certifying authority for the Permit, and a CWA Section 401 certification will be requested prior to Permit finalization.

14 MISCELLANEOUS

The effective date of the Permit and the Permit expiration date will be determined upon issuance of the Permit. The intention is to issue the Permit for a period not to exceed 5 years.

Permit drafted by Erik Makus, U.S. EPA, (406) 457-5017, March 2025.

ADDENDUM

AGENCY CONSULTATIONS

On [Month Day, Year], the Colorado State Historic Preservation Office [agreed with/disagreed with/disagreed with/disagreed with/did not comment on] the EPA's preliminary determination that the Permit reissuance will not impact any historic properties.

On [Month Day, Year], the EPA sent a sent a CWA Section 401 certification request to Colorado. Colorado [certified without Section 401 requirements/certified with the following Section 401 certification requirements/waived Section 401 certification]. Any review or appeal of these conditions must be made through State procedures pursuant to 40 CFR § 124.55(e).

[List any 401 certification requirements.]

PUBLIC NOTICE AND RESPONSE TO COMMENTS

The Permit and statement of basis were public noticed on the EPA's website on [Month Day, Year]. The comment(s) received and the response(s) are provided below/No comments were received.

Comment:

The commenter noted that ...

Response:

The following language was added to the final Permit./No changes were made to the final Permit: