STATEMENT OF BASIS

PERMITTEE:	United States Department of the Air Force
FACILITY:	Cheyenne Mountain Air Force Station
PERMIT NO.:	CO-0034762
RESPONSIBLE OFFICIAL:	Jason Cook Deputy Director, 721st Civil Engineer Squadron 721 CES/DD, Cheyenne Mountain AFS 1 NORAD Road, Suite 4102 Cheyenne Mountain AFS, Colorado 80914-8001 719-474-3180 E-mail: Jason.Cook@CheyenneMountain.af.mil
FACILITY CONTACT:	Wanda Burns Environmental Program Manager for CMAFS 719-474-3620 E-mail: wanda.burns@us.af.mil Mailing address: Wanda Burns 721 CES / CEIE 1 NORAD Road, Building 321 Cheyenne Mountain AFS, Colorado 80914
LOCATION:	In El Paso County, Colorado, at approximate latitude 38.744722º N and longitude 104.843333º W
RECEIVING WATERS	Unnamed ephemeral tributaries to Fountain Creek
PERMIT TYPE:	Federal Facility, Permit Renewal, Minor Permit

This statement of basis is for the renewal of the National Pollutant Discharge Elemination System (NPDES) permit for the U.S. Air Force's Cheyenne Mountain Air Force Station (CMAFS). The current Permit was issued in 2011 with an effective date of March 1, 2011, and an expiration date of December 31, 2015. The application for permit renewal was dated June 10, 2015 and received June 24, 2015. Receipt of the application was acknowledged in a letter of July 14, 2015. A letter dated March 30, 2016, stated that the Permit has been administratively extended.

Background Information:

Item XII, Nature of Business, of Form 1 of the permit renewal application contained the following statement.

> Cheyenne Mountain Air Force Station is an Air Force installation, located partially within Cheyenne Mountain itself. The complex was initially constructed to house the North American Defense Command Center (NORAD). The complex currently serves as an Alternate Command Center for NORAD, and is operated under the 721st Mission Support Group, and is a geographically separate unit of the 21st Space Wing, located on Peterson Air Force Base.

NOTE: Peterson Air Force Base is located in the nearby City of Colorado Springs, Colorado, and is approximately 9 miles to the northeast of CMAFS.

Although the status of the CMAFS has changed to an Alternate Command Center for NORAD, there is still significant activity within the facility. There have been some minor changes to the piping that carries the discharge out of the facility. The location of Outfall 001 was moved a short distance because it was necessary to replace part of the outfall line due to damage caused by a massive mudslide that occurred on September 12, 2013. The location of Internal Outfall 001B was moved closer to the entrance of the North Portal of the underground complex. Neither of these changes affect the quantity or quality of the water being discharged. It was learned in an email from the Permittee (April 4, 2016) that all water from the industrial reservoir is now routed to Pit 48 to Pit 52 then into the oil/water separator and then to the pipeline to the Fort Carson sanitary sewer system. Accordingly, Internal Outfall 001C is no longer needed as a control point and will not be used in the renewal Permit. As will be discussed later, a new Internal Outfall 001D has been added to the renewal Permit and will ultimately replace Internal Outfall 001A as a control point.

It should be noted that much of the material presented in the Background Information section of this statement of basis is from the previous statement of basis and is included for information purposes.

NOTE: The Confidential Business Information (CBI) folder of the permit file contains a flow diagram titled "Water Collection and Elimination Schematic, Cheyenne Mountain AS, Colorado," and other diagrams which help in understanding the sources of water and where the water goes. The diagrams were not included in the current Permit or statement of basis because of security concerns by the Air Force.

The CMAFS is located on the slopes of Cheyenne Mountain on the southwest edge of the City of Colorado Springs. The CMAFS complex was initially constructed as the North American Aerospace Defense Command Center (NORAD) and became operational in about 1964. A portion of the complex is located underground in a series of tunnels and chambers that house a self-contained command center. In addition to various buildings, the underground facilities include a drinking water reservoir, drinking water chlorination system, large diesel powered electric generators, cooling towers, and reservoirs for industrial (cooling) water. Water used in the underground complex normally comes from internal springs and water seepage into the reservoirs and for many years there has been more water than is needed. In addition, water sometimes seeps from the walls and ceilings of the various chambers and tunnels and drains to the floor.

The use of water within the complex includes drinking water, sanitary usage, cooling water for the diesel powered electric generators, and periodic hosing down of the interior rock walls and ceilings of the tunnels and chambers to remove loose rock. The latter is normally done yearly, but can be done more frequently if needed.

The electricity for the underground complex normally is purchased from commercial sources. However, some of the diesel generators are kept on standby status and all are operated periodically to insure their operating capability, for certain practice alerts, and when electricity is not available from the commercial source(s). When the diesel generators are operated, the cooling water from the generators normally is routed in a closed loop system to heat exchangers and returned to the diesel generators for reuse. Cooling towers are used to cool the water in the heat exchangers. The water in the cooling tower system is treated with a proprietary system called "Cascade UVOX ultra violet light system."

If the cooling towers cannot be used, the industrial water reservoirs can be used for cooling reservoirs. When this occurs, the cooling water from the closed loop cooling system is routed to the industrial reservoirs and mixed with the water in the industrial reservoirs. At the same time, water from the

industrial reservoirs is pumped into the closed loop cooling system to replace the water routed to the industrial reservoirs. The use of the industrial reservoirs for cooling purposes can occur in emergency situations; when it is necessary to do repairs, maintenance, equipment modifications, etc., that involve the cooling towers, etc.; and during training drills on how to use the industrial reservoirs as cooling reservoirs. According to the Permittee, no chemicals are presently used in the closed loop cooling system. However, there is the potential for metals to be corroded from the cooling system.

The various wastewaters, excess spring water, and drainage from the underground complex at CMAFS are either routed to the sanitary sewer system at nearby Fort Carson via a buried pipeline or discharged under the provisions of a NPDES permit. An exception is that when there is an excess of untreated spring water routed to the drinking water plant storage tanks, the excess flow is diverted to an unnamed tributary of Fountain Creek.

Waters and wastewaters going to the pipeline to the Fort Carson sanitary sewer system include the sanitary wastewaters from the underground complex, cooling tower blowdown, cooling tower basin cleaning wastes, infiltration water from the diesel storage reservoir, overflow from the drinking water reservoir, overflow from the industrial water reservoirs, and water collected in certain floor drains in the underground complex. All of these, with the exception of the sanitary wastewater, are collected in the Main Tunnel Pit 52 and pumped directly to an oil/water separator, which is located outside the underground complex. The effluent from the oil/water separator goes to the pipeline to the Fort Carson sanitary sewer system. The sanitary wastewaters are routed separately to the pipeline. There is a memorandum of understanding (MOU) between CMAFS and Fort Carson concerning the routing of wastewater from CMAFS to Fort Carson.

The current Permit authorizes the discharge from the **interior storm drainage system** (ISDS) at the CMAFS. After the ISDS leaves the underground complex there are two valves where the flow can be routed to either the oil/water separator via the industrial sewer (and on to the pipeline to the Fort Carson sewer system) or to the discharge line (over-the-hill), which discharges to an unnamed tributary to Fountain Creek. The normal operating procedure is to route the flow of the ISDS to the discharge line (and subsequently to surface waters) except when activities and/or conditions within the underground complex have the potential to significantly increase the concentration of pollutants in the ISDS. When that occurs, the flow is directed to the oil/water separator and on to the pipeline to the Fort Carson sanitary sewer system.

The location of these valves is designated as Internal Outfall 001B. When the current Permit was issued in 2011, Internal Oufall 001B was located in a valve box located just to the north of Building P106, which was located where the driveway to the North Portal (tunnel) turns off Norad Road. On September 12, 2013, there were approximately 14 inches of rainfall on Cheyenne Mountain. This resulted in an extensive mudflow which among other things, temporarily blocked the North Portal (tunnel) to the NORAD facility and affected the discharge line to Outfall 001. Starting September 22, 2013 and continuing through August 4, 2015, all flow from the ISDS was directed to the pipeline to the Fort Carson sanitary sewer system. As a result of the mudflow, it was necessary to install a new outfall line and move the control valves. These valves are still designated as Internal Outfall 001B, but are now located approximately 70 to 80 feet from the portal entrance at the north edge of the driveway. The approximate latitude and longitude of the valves are 38.744464º N and 104.846449º W, respectively. These valves are located at the ground surface at the north edge of the driveway that goes into the North Portal (tunnel). Outfall 001 was moved less than 100 feet to it new location. The approximate latitude and longitude of the new location of Outfall 001 are 38.744862º N and 104.843419º W, respectively.

The ISDS receives some of the excess spring flow, infiltration collected under Building 2000 (not currently done), and water from miscellaneous seeps that come out of the stone walls at various places and flow into the ISDS via grates located at numerous points in the complex. This water is relatively clean and can meet permit limitations without treatment. The Permittee is working on separating out more clean water that presently goes to Fort Carson and routing it to the ISDS.

An additional source of water and pollutants that drains to the ISDS comes from the periodic hosing down of the interior rock walls and ceilings of the tunnels and chambers. They are hosed down for safety purposes to remove loose rock. Each area is washed down at approximately yearly intervals or as needed. The water is applied with a hose that is connected to a tank truck and is applied at about normal household tap pressure. The runoff from the washing operations flows to the storm drains in the ISDS. During the washing operations the road surfaces are also hosed off. Normally a street sweeper is used to keep the interior roads clean. The water from the washing operations has the potential to contain significant quantities of suspended solids, etc. When the washing operations occur, the operating procedure is to direct the flow of the ISDS to the oil/water separator and on to the Fort Carson sanitary sewer system.

Initially, the primary reason for discharging the clean waters directly instead of routing them to Fort Carson was to try to keep to a reasonable minimum the amount of clean water routed to the Fort Carson sanitary sewer system. There is a cost involved in routing water through the sewage treatment plant. Another factor involves water rights. It is this writer's understanding that the Air Force does not get as much credit for water returned when water from the underground complex is routed to Fort Carson as compared to the water being discharged directly to surface waters at CMAFS. Apparently, if too much water is routed to Fort Carson, it might be necessary for the Air Force to provide downstream flow augmentation to meet downstream water rights. An increased emphasis has been placed on complying with water rights since the Supreme Court ruling in favor of the State of Kansas with regards to the Colorado - Kansas Water Compact.

The physical layout of the ISDS and discharge line presents some problems in terms of access for sampling and compliance points. The point where the ISDS enters the discharge line was buried and is located outside of the underground complex. At approximately 7,000 feet elevation, winter temperatures can be very cold at times. The discharge line discharges to the unnamed tributary part way down the slope on the east side of the parking lot at the North Portal. Access to that point can be difficult during dry weather and would be dangerous during inclement weather and/or when there is snow on the ground. Adding a separate pipeline for spring water, etc., within the underground complex would have some advantages, but would be difficult and very expensive due to the granite rock environment. **Primarily for these reasons it was decided to have interior outfalls instead of having the outfall at the final point of discharge to the unnamed tributary**.

In the current Permit, a combination of numerical effluent limitations, the requirement to develop and implement a pollution prevention plan (PPP), the prohibition of discharging certain waste streams, and restrictions on the use of the industrial reservoirs for cooling purposes are used to regulate the discharge from the ISDS. Because of the complexity of the system and access problems for monitoring purposes, there was no external Outfall 001 in the Permit, but there were three internal compliance points in the current Permit.

> Internal Outfall 001A is located at the grate in the ISDS in the main tunnel near the Diesel Maintenance blast door. It includes the grate and the flow meter and sampling tap in the ISDS just upstream of the grate.

Internal Outfall 001B is at the two valves in the pipelines where the flow of the ISDS is either routed to the oil/water separator or routed to the discharge line (over-the-hill). As previously mentioned, the valves were located in a valve box located on the ISDS just to the north of Building P106, which was located where the driveway to the North Portal (tunnel) turns off Norad Road. These valves are now located approximately 70 to 80 feet from the portal entrance at the north edge of the driveway. The approximate latitude and longitude of the valves are 38.744464º N and 104.846449º W, respectively. These valves are located at the ground surface at the north edge of the driveway that goes into the North Portal (tunnel).

Internal Outfall 001C was the discharge from the middle reservoir of the industrial reservoirs. If water were to be drained from the industrial reservoirs to the ISDS, it would come from the middle industrial reservoir and be pumped into the ISDS. In an email dated April 4, 2016, the Permittee informed this writer that the release of water from the industrial reservoirs is pumped to Pit 48 to Pit 52 to the oil/water separator and the pipeline to the Fort Carson sanitary sewer system. Accordingly 001C will not be used as a compliance point in the renewal Permit.

The current Permit requires that there be no discharge of sanitary wastes, cooling tower blowdown, wastes from the cleaning of cooling tower basins, water from Pit 48, water from Pit 52, and there shall be no discharge of water from the closed loop cooling system except as the result of the industrial reservoirs being used as cooling reservoirs. The reason for not discharging the sanitary wastes, the cooling tower blowdown, and the wastes from the cleaning of cooling tower basins without treatment is obvious. Waters from pits 48 and 52 have the potential for significant concentrations of pollutants and since there is no treatment of these waters if routed to the ISDS and discharged, these waters should be routed through the oil/water separator and on to the pipeline to the Fort Carson sanitary sewer system for further treatment. The prohibition on the discharge of water from the closed loop cooling system, except as the result of the industrial reservoirs being used as cooling reservoirs, was included to provide a control over where the water was discharged and being able to impose effluent limitations at that point. Water from the closed loop cooling system can be routed to Fort Carson along with the other wastewaters that go there.

In the current Permit, the numerical effluent limitations on Internal Outfall 001A are 30 mg/L as a 30 day average and 45 mg/L as a 7-day average on BOD_5 and total suspended solids (TSS), a daily maximum limitation of 10 mg/L on total petroleum hydrocarbons (THP) instead of a 10 mg/L limitation on Oil and grease, a pH limitation of 6.5 - 9.0, and the requirement that there be no discharge of floating solids or foam nor shall there be a visible sheen. The limitations on BOD_5 and TSS were based on the State of Colorado's Regulations for Effluent Limitations. The state's regulations include a 10 mg/L limitation on oil and grease, but a 10 mg/L limitation on TPH was used in the Permit instead. The limitation on pH was based on the water quality standards of the receiving waters and the fact that the water quality standards do not allow for a mixing zone for pH. The requirement that there is to be no discharge of floating solids or foam nor shall there be a visible sheen is based on regional policy and best professional judgement as provided for in Section 402(a)(1) of the Clean Water Act. The effluent limitations and monitoring requirements at Internal Outfall 001A do not apply when the valve at Internal Outfall 001B is closed so that there is no discharge from the ISDS to the discharge line (Outfall 001).

For Internal Outfall 001B, the current Permit requires that the valve be closed whenever any of the following conditions occur:

1. When there are "washing" operations (i.e., hosing down of the interior rock walls and ceilings of the tunnels and chambers) occurring within the underground portion of the complex;

2. When there are known operations within the underground portion of the complex that are known to have a reasonable likelihood of causing the effluent limitations at Internal Outfall 001A to be exceeded; and/or,

3. A spill is known to have occurred within the underground portion of the complex and there is a reasonable potential for pollutants from that spill to reach the ISDS.

For Internal Outfall 001C, the current Permit requires that the industrial reservoirs not be used as cooling reservoirs except on an as needed basis. This requirement is intended to minimize the discharge of water from the closed loop cooling system to the industrial reservoirs to the extent practical. The Permit requires that when the industrial reservoirs had been used as cooling reservoirs, water shall not be discharged from the industrial reservoirs to the ISDS when the valve at Internal Outfall 001B is open until a sample of the water can meet the following effluent limitations: total petroleum hydrocarbons 10 mg/L, total residual chlorine (TRC) 0.100 mg/L, pH 6.5 to 9.0, and the water can pass an acute whole effluent toxicity test based on an acute 48-hour static replacement toxicity test using *Ceriodaphnia dubia.* A grab sample is to be taken from either the middle reservoir of the industrial reservoirs or Internal Outfall 001C and used to demonstrate that the water from the middle reservoir can meet the above effluent limitations. It is this writer's understanding that there are no provisions for collecting a sample from the pipe that conveys water from the middle industrial reservoir to the ISDS, so samples must be collected from the middle reservoir. Since the current Permit was issued there has not been a discharge from Outfall 001C while the valve at Internal Outfall 001B was open, i.e., routing the flow of the ISDS to the external storm drainage system.

The current Permit requires the Permittee to continue to implement a pollution prevention plan (PPP) with the primary objective of minimizing the entry of pollutants into the ISDS when the valve at Internal Outfall 001B is open.

In addition to the discharge from the ISDS to the discharge line via Outfall 001A, the current Permit authorizes discharges from the drain lines from the exhaust stacks that are part of the ventilation system for the underground complex at CMAFS. Exhaust gases from the generators, vapors from the cooling towers, stale air, etc., are collected and blown out through the exhaust stacks. There are two exhaust stacks, a "north stack" and a "south stack". Normally only one exhaust stack is used at a time, with the south stack used most of the time. The exhaust stacks are vertical and approximately 12 feet in diameter. The exhaust comes into the stack from the side near the base of the stack. At the base of each exhaust stack there is a sump for collecting any water that may collect in that portion of the ventilation system. It is this writer's understanding that the temperatures in a stack when it is being used is approximately 160^0 F, so there should not be any condensation of water from the exhaust gases. However, water can collect in the sumps during heavy precipitation and possibly from groundwater infiltration. Each sump has an overflow drain line that slopes downward and outward, ending at the ground surface in a vertical concrete wall a few feet high. The end of the drain line from the north stack has become covered by loose rock that slid down the slope. The Air Force indicated that it is considering uncovering the end of the drain line, but at this time there are no definite plans to do so. The drain lines from the north stack and south stack were designated Outfall 002 and Outfall 003, respectively.

Actual discharges from the two drain lines have not been observed. In order to get an idea of how much water could potentially be discharged from a drain line due to precipitation, this writer did calculations using data from the National Oceanic and Atmospheric Administration's (NOAA) Western U.S. Precipitation Frequency Maps (Atlas 2 published in 1973). For the area of the CMAFS, a 1 in 100 year, 6-hour precipitation event is approximately 3.6 inches. For an area 12 feet in diameter, that would give approximately 254 gallons of water, assuming there were no evaporation losses. If that water were discharged over the 6-hour period, the average flow rate would be about 0.7 gallon per minute (gpm). A 1 in 100 year, 24-hour precipitation event is about 5 inches, which would result in about 353 gallons and an average discharge rate of about 0.25 gpm over the 24 hours. It is not known if this water would reach waters of the U.S. as surface flow.

The current Permit does not contain numerical effluent limitations for the potential discharges from Outfalls 002 and 003. If there were to be a discharge to waters of the U.S., the discharge would most likely be due to heavy precipitation. Part 1.3.5 of the Permit specifies that there are no numerical effluent limitations for Outfalls 002 and 003. Instead, Part 1.4. of the Permit required the Permittee to modify the PPP (developed and implemented under the previous Permit for the ISDS) to include provisions for minimizing the potential for discharging pollutants, via Outfalls 002 and 003, from the sumps located in the air stacks. The Permit also required the Permittee to continue to implement the provisions of the PPP that apply to the ISDS. The Permit requires that at least annually, Outfalls 002 and 003 and the immediate areas down gradient from them shall be inspected for signs of sediment, oil and grease, and/or other pollutants having been discharged from either outfall. To the extent practical, the inspections should be conducted within a week after a rainfall event of 1 inch or greater.

Because of the massive mudslide that occurred on September 12, 2013, the outfall line to Outfall 001 was significantly damaged and the control valves at Internal Outfall 001B were buried. From September 22, 2013, through August 4, 2015, all flow through Internal Outfall 001B was routed to Fort Carson. Starting August 5, 2015, the use of Outfall 001 was resumed after the necessary repairs and changes were made.

Self-Monitoring Data

A summary of the self-monitoring data for April 1, 2011, through March 31, 2016, is given below. The flow data that were included in the discharge monitoring reports (DMRs) were not included in the summary because the reported data included flow data that occurred when the flow was being routed to Fort Carson. Instead, the flow data presented in the summary are based on a review by this writer of the daily operational logs that the Permittee was required to maintain.

Parameter	Minimum	Maximum	Average
pH, s.u.	6.5	8.3	N/A
Total suspended Solids, mg/L	0	26	13.7
Total Petroleum Hydrocarbons, mg/L	0	0.53	0.2
Oil and Grease, visual	None	None	N/A
BOD_5, mg/L	0	0.6	0.4
Total Flow Discharged/Calendar Quarter, gallons a/	19,305	1,348,400	463,020
Average Flow/Day When Discharging, gpd b/	212	16,246	5,418
Range of Daily Flows, gpd	0	241,900	N/A

a/ The total amount of water discharged to Outfall 001 during the calendar quarter when a discharge occurred during the quarter.

b/ The total amount of water discharged during a calendar quarter divided by the number of days the valves were set to allow a discharge to Outfall 001. Some days no discharge occurred.

There was no reported discharge from Outfall 001C, the industrial reservoir, from April 1, 2011 through March 31, 2016. Likewise, for Outfalls 002 and 003, it was reported that the inspections found no signs of contaminants being discharged.

Metals Data for Drinking Water System

The Safe Drinking Water Program in the Water Quality Control Division (WQCD) of the Colorado Department of Public Health and Environment (CDPHE) has metals data for the drinking water system at the CMAFS. Although the data is for the drinking water system and not the discharge from Outfall 001, most of the data gives an indication of the metals content of the spring water that is the source of most of the water inside the underground facility. All of the samples except for the samples for lead and copper were taken from a tank that stores drinking water for the drinking water system. The samples for lead and copper were taken from the distribution system of the drinking water system, with several samples collected during each sampling event. Starting in 1996 there were 10 samples per sampling event. The 90th percentile value of lead and copper for each sampling event were listed.

To obtain a general idea of the current concentrations of metals in the spring water, **the data from 2007 to 2015 were summarized**. Below is a listing of the metal analyzed for; the detection limits of the analytical methods used, when given; and the maximum concentrations reported for that metal. For lead and copper, the maximum reported 90th percentile value is given. The data for lead and copper are for samples that were collected in 2007, 2010, 2012, and 2015 and the data for the other metals are for samples collected in 2007, 2008, and 2012. With the exception of the lead and copper values, the data indicate that the spring water has a low mineral content. The concentrations of lead and copper should not be considered representative of the quality of the spring water because the samples were collected from the drinking water distribution system, where there is the potential for leaching of lead and copper. However, as a precautionary measure, the renewal Permit will require monitoring at Outfall 001A for lead, copper and hardness. In water with low hardness, the concentrations of lead and/or copper reported for samples from the distribution system would be toxic to aquatic life.

Summary of Metals Data for Drinking Water System

Analyte	Detection Limit mg/L	Maximum Value, mg/L
Arsenic c/	0.001	ND
Barium c/	NG	0.073
Cadmium c/	0.001	ND
Chromium c/	0.001	ND
Mercury c/	0.0002	ND
Nickel c/	0.001	ND
Selenium c/	? a/	0.001 a/
Sodium c/	NG	9.9
Antimony, Total c/	0.003	ND
Beryllium, Total c/	0.0003	ND
Thallium Total c/	0.0003	ND
Lead d/	NG e/	0.008 b/
Copper d/	NG e/	0.17 b/

a/ Two samples had 0.002 mg/L listed as detection limit and zero listed as resultant measure. The third sample had a resultant measure of 0.001 mg/L listed and no detection limit given.
b/ Maximum of the 90th percentile values reported.
c/ Data from 2007, 2008, and 2012 samples.
d/ Data from 2007, 2010, 2012, and 2015 samples.
e/ Detection limit not given.

Receiving Waters

The discharge from Outfall 001 and the potential discharges from Outfalls 002 and 003 potentially could go to unnamed ephemeral tributaries of Fountain Creek, which is a tributary of the Arkansas River. The discharge from Outfall 001 and the potential discharge from Outfall 002 go to an unnamed ephemeral tributary that flows to the east for approximately two miles before crossing under state Highway 115, approximately 1/4 of a mile to the south of O'Connell Blvd, and onto the **Fort Carson Military Reservation** (FCMR). On the FCMR, the unnamed tributary combines with other unnamed streams and drainageways to form one stream that flows to the southeast into Fountain Creek in Section 6, T16S, R68W near the City of Fountain. The potential discharge from Outfall 003 potentially would go to one of the unnamed tributaries in Limekiln Valley. The drainage from Limekiln Valley flows east onto the FCMR and near Prussman Blvd. it combines with the previously mentioned drainageway that flows into Fountain Creek

Based on simple measurements on a map, this author estimates that it is at least 10 stream miles from the point of discharge from Outfall 001 to the confluence of the unnamed tributary with Fountain Creek. All but the last 1/4 to 1/2 mile of the unnamed tributaries are in Stream Segment 4 of the Fountain Creek Basin for purposes of stream classifications by the state of Colorado. Streams and reservoirs in Segment 4 are classified for Class 2 Aquatic Life Warm, Class E Recreation, Water Supply and Agriculture and are designated use-protected. The assigned water quality standards include the following:

Physical and Biological	Inorganic, mg/L		Metals, ug/L		
T=TVS(WS-II) ºC D.O. = 5.0 mg/L pH = 6.5-9.0 E. Coli = 126/100 mL Chla=150 mg/m^2 [C]	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.019 CN=0.005 S=0.002	B=0.75 NO_2=0.5 NO_3=10 Cl=250 SO_4=WS P=170ug/L (tot)[C]	As(ac)=100 As(ch)=0.02-10 (Trec)[A] Cd(ac/ch)=TVS CrIII(ac)=50 (Trec) CrIII(ch)=TVS	CrVI(ac/ch)=TVS Cu(ac/ch)=TVS Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01(tot) Mo(ch)=160(Trec) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS

(ac) = acute; (ch) = chronic; (dis) = Dissolved; (Trec) = Total recoverable; TVS = Table Value Standard; tot = Total; WS = Water supply; WS = Warm Stream Tier II temperature standard

[A] = Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second

number in the range. Water bodies will be considered in attainment of this standard and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

[C] = Total phosphorus and chlorophyll *a* standards apply only above the facilities listed at 32.5(4) (i.e., Regulation 32 at 32.5(4)).

Stream Segment 5 of the Fountain Creek Basin for purposes of stream classification includes the unnamed tributary from the boundary of Fort Carson to the confluence with Fountain Creek. It is approximately 1/4 to 1/2 mile in length. Stream segment 5 is classified for Class 1 Aquatic Life Warm, Class N Recreation, and Agriculture and is undesignated. The assigned water quality standards include the following:

Physical and Biological	Inorganic, mg/L		Metals, ug/L		
T=TVS(WS-II) ºC D.O. = 5.0 mg/L pH = 6.5-9.0 E. Coli = 630/100 mL	NH_3(ac/ch)=TVS Cl_2(ac)=0.019 Cl_2(ch)=0.019 CN=0.005 S=0.002	B=0.75 NO_2=0.5 NO_3=100 P=170ug/L (tot)	As(ac)=340 As(ch)=100 (Trec) Cd(ac/ch)=TVS CrIII(ac/ch)=TVS CrIII(ch)=100 (Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(tot) Mo(ch)=160(Trec)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS

(ac) = acute; (ch) = chronic; (Trec) = Total recoverable; TVS = Table Value Standard; (tot) = Total; (WS-II) = Warm Stream Tier II temperature standard

Water Quality Considerations and Antidegradation Review

Based on available information, it is anticipated that the discharges authorized by the renewal permit will not cause a violation of water quality standards in Stream Segments 4, 5 and 2a of Fountain Creek if the conditions of the renewal Permit are met. Section 31.8(2) of the state of Colorado's *Basic Standards and Methodologies for Surface Water*, specifies that undesignated waters are subject to the antidegradation review provisions of section 31.8(3) of the regulations. Stream segments designated as use-protected are not subject to the provisions of the antidegradation review process. The antidegradation regulations were effective December 22, 2000. Since the discharge potentially could reach Stream Segments 5 and 2a of the Fountain Creek Basin (in that order) and since those stream segments are undesignated, the discharges are subject to the antidegradation review provisions of section 31.8(3). The first step of the screening process for the antidegradation review involves determining if there is a new or increased water quality impact from the discharges. The baseline water quality for purposes of making a comparison is to be based on the ambient water quality as of September 30, 2000. Since the wastewater sources are unchanged, the effluent limitations in the renewal Permit will remain essentially the same, and it is unlikely that the discharges will reach Segments 5 and 2a except during wet weather runoff conditions, which will provide dilution, this writer believes that it is highly unlikely that there will be new or increased water quality impacts due to the discharges from this facility. Therefore, in accordance with the antidegradation regulations and guidance, an antidegradation review is not necessary.

Addition of New Internal Outfall:

Because of the numerous points where flow and/or pollutants can enter the ISDS downstream of 001A, the renewal Permit requires the Permittee to install a new Internal Outfall 001D within the North Portal near the entrance. It is to be located either at the last floor grate in the ISDS before the entrance or in a manhole between the last floor grate and the entrance. It is to be operational as soon as reasonable and practicable, but no later than one (1) year after the effective date of the renewal Permit. Then the effluent limitations and monitoring requirements that apply to Internal Outfall 001A will apply to Internal Outfall 001D and will no longer apply at Internal Outfall 001A. A compliance schedule is not required because the new outfall is to be operational whithin one year after the effective date of the Permit.

Permit Limitations in Renewal Permit:

The NPDES regulations at 40 CFR Part 122.44(l) require that effluent limitations in a renewal Permit, with certain exceptions, be at least as stringent as the effluent limitations in the previous Permit. The general effluent limitations and prohibitions given in Part 1.3.1.1 of the renewal Permit have been changed somewhat in that there is to be no discharge of water from the industrial reservoirs. Because there is to be no discharge from the industrial reservoirs, Internal Outfall 001C is no longer needed and will not be used as a control point in the renewal Permit.

The effluent limitations for Internal Outfalls 001A and 001B in the renewal Permit are basically the same as in the current Permit. One exception is changing the 10 mg/L limitation of total petroleum hydrocarbons to a limitation of 10 mg/L on oil and grease. The change is being made because there is not an approved analytical procedure for total petroleum hydrocarbons list under 40 CFR Part 136 and the concerns of some that the analytical proceude for total petroleum hydrocarbons giving false positives. The effluent limitations for Internal Outfall 001A and subsquently to Internal Outfall 001D are given below.

Effluent Characteristic	Effluent Limitation		
	30-Day Average a/	7-Day Average a/	Daily Maximum a/
BOD_5, mg/L	30	45	N/A
Total Suspended Solids, mg/L	30	45	N/A
Oil and Grease, mg/L	N/A	N/A	10
The pH of the discharge shall not be less than 6.5 or greater than 9.0 in any sample.			
There shall be no discharge of floating oil nor shall there be a visible sheen.			

a/ See Definitions, Part 1.1 for the definition of terms.

The limitations on BO D_5, total suspended solids, and oil and grease are based on the State of Colorado's Regulations for Effluent Limitations. On a practical basis there is not a need for effluent limitations on BOD_5 except as a safeguard. The limitation on pH is based on the water quality standards of the receiving waters and the fact that the Colorado water quality standards do not allow for a mixing zone for pH. Furthermore, there often would not be any dilution water in the stream, so the effluent limitation has to be effective at the point of discharge. The requirement that there is to be no discharge

of floating oil nor shall there be a visible sheen is based on regional policy and best professional judgement as provided for in Section 402(a)(1) of the Clean Water Act.

There will not be any effluent limitations on temperature because the discharge from Outfall 001 goes to an ephemeral stream and there is no evidence that the aquatic life use may be negatively affected by the thermal component of the discharge. See Part III.2.a of the CWQCD's Procedures for Conducting Assessments for Implementation of Temperature Standards in Discharge Permits, Policy No. WQP-23, July 3, 2008.

The Colorado Water Quality Control Commission (WQCC) established Regulation #85, Nutrients Management Control Regulation (5 CCR 1002-85) effective September 30, 2012. Among other things, Regulation 85 establishes technology based effluent limitations on total inorganic nitrogen and total phosphorus for certain domestic wastewater treatment works (DWWTW) and certain non-domestic wastewater treatment works (i.e., industrial discharges). It also establishes monitoring requirements. The effluent limitations for non-domestic wastewater treatment works that were discharging prior to May 31, 2012, apply to those (A) whose Standard Industrial Classification code is in the Major Group 20 and (B) any other non-domestic discharger for which the Division has determined, based on credible information that the facility is expected, without treatment for nutrients, to discharge total inorganic nitrogen or total phosphorus concentrations to surface waters in excess of the respective effluent limitations in section 85.5(1)(a)(iii). Those effluent limitations are given below.

Parameter	Parameter Limitations	
	Annual Median a/	95th Percentile b/
(a) Total Phosphorus	1.0 mg/L	2.5 mg/L
(b) Total Inorganic Nitrogen c/	15 mg/L	20 mg/L

a/ Running Annual Median: The median of all samples taken in the most recent 12 calendar months.
b/ The 95th percentile of all samples taken in the most recent 12 calendar months.
c/ Determined as the sum of nitrates as N, nitrite as N, and ammonia as N.

Based on available information, it appears highly unlikely that the concentrations of either total phosphorus or total inorganic nitrogen in the discharge from Outfall 001 will come close to the above effluent limitations. Therefore, no effluent limitations on nutrients will be put in the renewal Permit. If subsequent monitoring indicated that effluent limitations on either nutrient are appropriate, the limitation(s) will be placed in the Permit upon renewal.

For **Internal Outfall 001B** the renewal Permit requires that the valve be closed (i.e., no discharge to surface waters) when certain conditions occur. The conditions are the same as in the current Permit and are given in Part 1.3.1.3 of the Permit.

For **Outfalls 002 and 003** the current Permit had no numerical effluent limitations, but instead depended on the development and implementation of a pollution prevention plan to minimize the discharge of pollutants. The renewal Permit has the same requirements. The next section, Pollution Prevention Plan, has more details about what the Permit requires regarding the pollution prevention plan. Part 4.15.4 that provides for modifying the Permit if inspections and/or other information show that effluent limitations are appropriate for Outfalls 002 and/or 003.

Pollution Prevention Plan

Starting with the Permit issued in 2000, the Permittee was required to develop and implement a pollution prevention plan (PPP) to minimize the entry of pollutants into the interior storm drainage system during periods when the valve at Internal Outfall 001B is open. The Permit issued in 2005 required the Permittee to continue to implement the PPP for the interior storm drainage system and to modify the PPP to include provisions for minimizing the potential for discharging pollutants, via Outfalls 002 and 003, from the sumps located in the air stacks. The provisions were to include, but not necessarily be limited to, measures that can be taken to minimize pollutants being discharged from the sumps as the result of repair activities and maintenance activities in the air stacks. Those requirements were continued in the Permit issued in 2010 and will be continued in the renewal Permit.

Part 1.4 of the renewal Permit requires the Permittee to continue to implement the PPP for the interior storm drainage system and Outfalls 002 and 003 that was developed and implemented as a requirement of previous Permits. The PPP must be amended whenever there is a change in design, construction, operation, or maintenance at the facility which has a significant effect on the discharge, or potential for discharge, of pollutants from the interior storm drainage system and/or Outfalls 002 and 003. The PPP is also to be amended whenever during an inspection or investigation by the Permittee or federal officials it is determined that the PPP is ineffective in eliminating or significantly minimizing the discharge of pollutants from the interior storm drainage system and/or Outfalls 002 and 003. The PPP shall be reviewed annually to determine if it needs to be amended to meet the objectives of the PPP. If appropriate, the PPP shall be amended.

Self-Monitoring Requirements

The self-monitoring requirements in the renewal Permit are given in Part 1.3.2 and are similar to those in the current Permit with the exception of the frequencies for BOD_5 and Oil and Grease for Internal Outfall 001A. The self-monitoring data for the current Permit have consistently shown BOD_5 concentrations below the detection level. That is not surprising for this type of effluent. During the same period the reported concentrations of TPH ranged from non-detect to a maximum of 0.53 mg/L, whereas the effluent limitation is 10 mg/L. The Permit does require that a grab sample be collected and analyzed for oil and grease if a sheen and/or floating oil are observed in the visual monitoring. As in the current Permit, **for Internal Outfall 001A only, the monitoring results obtained when there is a discharge to the discharge line shall be reported on the discharge monitoring report**.

In addition to reporting the monitoring results when there is a discharge to the discharge line, the Permit requires a monthly log to be maintained that at a minimum includes the following: (1) the dates when flow is being discharged to Outfall 001; (2) all flow meter readings taken when flow is being directed to Outfall 001; and (3) the total volume of water discharged since the previous meter reading. (NOTE: a format similar to the log used during the previous Permit is acceptable.) The log shall be in the form of an *Excel*® spreadsheet file. For each reporting period (i.e. calendar quarter) a spreadsheet containing the three monthly logs for that reporting period shall be attached to the NetDMR for that reporting period and submitted with the NetDMR.

Routine monitoring for temperature will not be required because the discharge is intermittent, often of low volume, and there is very little thermal input caused by man to the water being discharged. The temperature of the discharge will be primarily determined by the volume and temperature of the infiltrating groundwater and the ambient temperature within the facility. As a check, quarterly monitoring of the temperature of the discharge at Internal Outfall 001A and subsquently at Internal Outfall 001D will be required. This requirement may be deleted when the Permit is reissued in about

2021 if additional temperature data are not considered necessary. Instream monitoring for temperature will not be required because the receiving water is an ephemeral drainageway and generally there is no flow during dry weather other than from the discharge.

As part of an effort to regulate the discharge of nutrients, the Colorado WQCD established Regulation 85, which establishes technology based effluent limitations and monitoring requirements for total inorganic nitrogen and total phosphorus for discharge from certain domestic wastewater systems (DWWTS) and some non-DWWTS. Regulation 85 currently only requires those non-DWWTS facilities whose Standard Industrial Classification (SIC) code is in the Major Group 20 and those facilities that are expected to exceed the applicable effluent limitations for nutrients without treatment, to develop a monitoring program. This facility does not belong in SIC Major Group 20, however it has not been documented that the discharge does not exceed the applicable effluent limitations for nutrients without treatment. In order to determine whether or not the discharge from Outfall 001A contains nutrients in significant concentrations, the Permit will require the Permittee to monitor the discharge at Outfall 001A and subsquently at Internal Outfall 001D for total inorganic nitrogen and total phosphorus.

As previously mentioned in the section on Metals Data for Drinking Water System, the Permit will require monitoring of discharges at Outfall 001A and subsquently at Internal Outfall 001D for lead and copper to determine effluent concentrations. Because the toxicity to aquatic life of both lead and copper are hardness dependent, monitoring for hardness at the same time the lead and copper samples are collected will be required.

There is a provision that for the monitoring for total inorganic nitrogen, total phosphorus, lead, and copper, after a minimum of 10 samples have been collected, the Permittee may request that the frequency of monitoring for this effluent characteristic be reduced or eliminated based on a reasonable potential analysis of the data collected since the Permit was issued. The reasonable potential analysis shall be done based on a lognormal distribution and a 95 percent confidence interval.

Based on the information submitted, the Permit issuing authority may do one of the following: (1) not make any change in the monitoring frequency; (2) reduce the frequency of monitoring to quarterly; or (3) delete the monitoring requirement for that effluent characteristic. These changes may be made without going to public notice.

On October 22, 2015, the National Pollutant Discharge Elimination System (NPDES) Electronic Reporting Rule was published in the *Federal Register* (80 FR 64064). The rule became effective on December 21, 2015, and involves two phases. Phase 1 includes the requirement that by no later than December 21, 2016, entities that are required to submit DMRs must do so electronically unless a waiver from electronic reporting is granted to the entity. Phase 2 includes the requirement that by no later than December 21, 2020, other specified reporting must be done electronically.

As part of a trial program, the Permittee has been submitting effluent monitoring results electronically. Part 2.4 of the Permit, Reporting of Monitoring Results, has been revised to reflect the electronic reporting rule and the fact that the Permittee is already submitting monitoring results electronically using "NetDMR". The logs of flow monitoring required in footnote b/ of Part 1.3.2.1 of the Permit shall be put in an *Excel*® spreadsheet file and attached to the NetDMR. The Permittee has managed to do this.

The reports that are to be submitted electronically after December 21, 2020, are to be submitted using "NeT". The instructions on how to use "NeT" are not yet available. The Permittee will in the future

receive instructions on how to use "NeT". Until then, the Permittee shall continue to submit any other reports (e.g., Parts 2.8 and 2.9) in paper format and mailing them to the specified addresses.

Biological Evaluation for the Endangered Species Act (ESA) Requirements.

Section 7(a) of the Endangered Species Act requires federal agencies to insure that any actions authorized, funded, or carried out by an agency are not likely to jeopardize the continued existence of any federally-listed endangered or threatened species or adversely modify or destroy critical habitat of such species. As on November 10, 2015, the federally listed threatened (T) and endangered (E) species found in El Paso County, Colorado, consisted of the following:

Group	Common Name and Species	Status	Conditional
Birds	Least tern (interior population) (*Sternula antillarum*)	E	1/
Birds	Mexican spotted owl (*Strix occidentalis lucida*)	T	
Birds	Piping pliver (*Charadrius melodus*)	T	1/
Birds	Whooping crane (Grus americana)	E	1/
Fishes	Greenback cutthroat trout (*Oncorhynchus clarki stomias*)	T	
Fishes	Palid sturgeon ((Scaphirhynchus albus)	E	1/
Flowering Plants	Ute ladies'-tresses orchard (*Spiranthes diluvialis*)	T	
Flowering Plants	Western prairie fringed orchid (Platanthera praeclara)	T	1/
Mammals	Preble's meadow jumping mouse (*Zapus hudsonius preblei*)	T	

1/ This species only needs to be considered if the following condition applies: Water-related activities/use in the N. Platte, S. Platte, and Laramie River Basins may affect listed species in Nebraska.

In El Paso County critical habit has been designated for the Mexican Spotted Owl (69FR53213, August 31, 2004) and the Preble's Meadow Jumping Mouse (75FR78483, December 15, 2010). For the critical habitat unit for the owl located near the CMAFS (Unit SRM-C-1a. Pike's Peak Area, El Paso, Teller, and Fremont Counties, Colorado) the following is stated in the *Register Federal*:

> This unit is located west of Colorado Springs on the flanks of Pike's Peak. It contains FS (Pike Ranger District, Pike/San Isabel National Forests) and BLM (Royal Gorge Field Office) lands in size. Areas with steep slopes (greater than 40 percent slope), canyons, and rocky outcroppings with mixed-coniferous forests are included in this unit. State, private, and military lands (Cheyenne Mountain Operations Center) are not designated as critical habitat.

In the Arkansas River drainage the critical habit for the Preble's Meadow Jumping Mouse consists of Unit 11: Monument Creek, El Paso County. According to the *Federal Register* notice it encompasses approximately 3,295 acres (1,333 hectares) on 38 miles (61 kilometers) of streams within the Monument Creek watershed. This area is north and upstream of the area affected by the discharge authorized by this Permit.

For the reasons given below, the EPA finds that reissuance of this NPDES Permit (CO-0034762) for the CMAFS is Not Likely to Adversely Affect any of the species listed as threatened or endangered for El Paso County by the U.S. Fish and Wildlife Service under the Endangered Species Act nor their critical habitat.

1. This facility discharges into unnamed ephemeral tributaries of Fountain Creek, which flow into the Arkansas River at Pueblo. The self-monitoring data for Outfall 001 during the current Permit show that the volume of water discharged is variable, ranging from zero during periods of no discharge to a maximum of approximately 250,000 gallons per day (gpd), or approximately 0.4 cfs. During periods of low discharge rate (i.e., a few gallons per minute, and no precipitation, it is possible that the discharge will seep into the ground before leaving the facility property as surface flow. Because it is an estimated 10 stream miles to the confluence with Fountain Creek, it is unlikely that the discharges will reach Fountain Creek except during periods of wet weather runoff conditions or frozen ground.

   For Outfalls 002 and 003 (i.e., the discharges from the two exhaust stacks) the discharges are infrequent and would be of very small volume (e.g., estimated at less than 353 gallons over a 24 hour period for a 1 in 100 year precipitation event for each outfall) and would be extensively diluted by the precipitation that caused the discharges to occur. It is possible that the discharges would soak into the ground before leaving the facility property.

2. Five of the nine listed species are conditionally listed because they are located in Nebraska within the Missouri River Basin, but all the discharges covered by this Permit are located in the Arkansas River Basin.

3. The Permit requirements are protective of water quality.

4. From the point the unnamed tributary leaves the CMAFS property until it reaches the confluence with Fountain Creek (an estimated distance of about 10 miles), only about a mile is not through areas where humans are present on a regular basis. There is a subdivision just to the east of the CMAFS facility. Once the tributary goes under Colorado Highway 115, the tributary flows through the populated portion of the Fort Carson Military Reservation. The confluence with Fountain Creek is located just east of Interstate Highway 25, within the boundaries of the City of Fountain, Colorado.

5. The Permit requirements do not necessitate any construction activities outside of the underground portion of the facility.

6. The facility was constructed in the mid-1960s and has been operational since 1967. It was placed on “warm standby” operational status in 2008. The amount of water discharged is largely dependent upon the amount of precipitation that occurs and infiltrates into the underground portion of the facility.

National Historic Preservation Act (NHPA) Requirements.

Section 106 of the National Historic Preservation Act (NHPA), 16 U.S.C. § 470(f) requires that federal agencies consider the effects of federal undertakings on historic properties. The EPA has evaluated its planned reissuance of the NPDES Permit for the Cheyenne Mountain Air Force station to assess this action’s potential effects on any listed or eligible historic properties or cultural resources. The EPA does not anticipate any impacts on listed/eligible historic properties or cultural resources because this Permit is a renewal and will not be associated with any new ground disturbance or significant changes to the volume of discharge nor any new points of discharge (i.e., Outfalls). The EPA is also requesting comments on the possible adverse effects of reissuing the Permit on historc properties and/or cultural resources in the area.

Miscellaneous

The renewal Permit will be issued for approximately five years, with the effective date and the expiration date of the Permit determined at the time of issuance of the Permit, but not to exceed five years.

Permit drafted by Bob Shankland
SEE, 8P-W-WW, EPA Region 8
September 7, 2016