

**WASTEWATER DISPOSAL REPORT**  
**FOR**  
**DWIRE STORAGE YARD FILING NO. 1**  
**EL PASO COUNTY, COLORADO**

JUNE 2020

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Project #43-117

# WASTEWATER DISPOSAL REPORT FOR DWIRE STORAGE YARD FILING NO. 1

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# **WASTEWATER DISPOSAL REPORT FOR DWIRE STORAGE YARD FILING NO. 1**

## **PURPOSE**

This document is intended to serve as the Wastewater Disposal Report for Dwire Storage Yard Filing No. 1. The purpose of this document is to provide details and information of the Cherokee Metropolitan District Wastewater treatment facility.

This report satisfies the requirements set forth by the El Paso County Land Development Code Section 8.4.8.D (Wastewater Disposal-Public System).

## **GENERAL LOCATION AND DESCRIPTION**

DWIRE Storage Yard Filing No. 1 is located in the southeast quarter of the southwest quarter of Section 28, Township 13 South, Range 65 West of the 6th P.M. in El Paso County, Colorado. The parcel is bound to the north by the Rock Island Trail and vacant land, to the west by Transit Mix site, to the south by Lot 7 of the Marksheffel Industrial Park, Capitol Drive, and to the east by Timberline Storage Yard.

The 19.362 acre site is currently zoned 1-3 CAD-O and shall consist of one (1) industrial lot. The Site Development Plan proposes the initial development of Lot 1. Lot 1 poses the construction of a (2) story w/ basement totaling 11,925 SF office building, a warehouse storage facility to include a parking lot, landscaping, utilities and full spectrum detention facility.

## **WASTEWATER SERVICE**

The DWIRE Storage Yard Filing No. 1, project site is within the Cherokee Metropolitan District boundary. The Cherokee Metropolitan District shall treat the wastewater generated by the DWIRE Storage Yard Filing No. 1 subdivision. The site has been previously provided at the south property line in Capital Drive an 8" PVC sewer stub, and with the development of Lot 1, the sanitary sewer main shall be extended north of the proposed parking lot, with a manhole and stub for future connection. See Appendix for "Will Serve Letter, issued by Cherokee Metropolitan District and Site Plat Map).

# CHEROKEE METROPOLITAN DISTRICT TREATMENT FACILITY (Facility Information Provided by Cherokee Metropolitan District)

## HEADWORKS:



The basic functions of a headworks system are to remove trash and grit from wastewater prior to pumping and treatment.

That task is generally accomplished with two separate components: bar screens (as described below) and grit removal systems. Removing grit and trash prior to pumping or treating wastewater prolongs the life of pumps and motors while reducing costly chemicals and extra electricity otherwise required in the wastewater treatment process.

The District also believes that the headworks will cut down on odors from the Peterson Wastewater Facility and increase treatment plant efficiency. A low interest loan for \$2 million was secured through the Colorado Water Resource and Power Development authority for the project.

## **BAR SCREENS:**

Bar screens are typically at the headworks (entrance) of a wastewater treatment plant (WWTP), bar screens are used to remove large objects such as rags, plastics bottles, bricks, solids, and toy action figures from the waste stream entering the treatment plant. Bar screens are vital to the successful operation of a plant, they reduce the damage of valves, pumps, and other appurtenances.

### **Floatables**

Floatables are also removed at the entrance to a treatment plant; these are objects that “float” on the surface of the water and, if not removed, end up in the primaries or aeration tanks. It is not uncommon to see floatables hanging over the weirs of some clarifiers. Though they don’t diminish the function of those processes, floatables are rather unsightly.

Another place where floatables can become a problem is at combined sewer overflow (CSO) outfalls, which is also where trash racks and bar screens are used. During wet weather events when a treatment plant’s capacity is overloaded, flow may be diverted to an outfall where raw sewage and rain water are discharged to a body of water. Both trash racks and bar screens may be installed at an upstream location of the outfall. In some instances, they are installed in tandem. The trash rack is installed upstream of the bar screen to prevent damage to the unit. Even though the bar screens are very durable, they are not designed to withstand the impact of some of the debris that enter a combined sewer. In many cases screening is the only treatment the combined sewer flow will see prior to being discharged.

### **Types of Bar Screens**

There are various types of bar screens available for installation, they include but are not limited to chain bar screens, reciprocating rake bar screens, catenary bar screens, and continuous belt bar screens.



Typically bar screens fall under two classification, mechanical bar screens and manual bar screens (trash racks can either be manually cleaned or mechanically cleaned). Both manual and mechanical screens contain equally spaced vertical or inclined bars that span the width of a channel.

Design considerations for both mechanical and manual screens include: bar spacing, bar size, geometry of bar, channel width, angle of screen and approach velocity. While some WWT plants still use manually cleaned bar screens, because they are so labor intensive the trend is to move toward mechanical bar screens. Mechanical bar screens are the more routinely used type because of their ability to operate automatically.

## Coarse Versus Fine Bar Screens

Moreover, coarse bar screens (or bar screens) are distinguished from fine screens by the space opening. Coarse screens usually have a spacing of 6 millimeters (mm) (or 0.25 inches [metric system conversion]), and larger, whereas fine screens spacing is usually between 1.5 mm (or 0.059 inches) through 6 mm (or 0.25 inches). Fine screens are installed at some wastewater treatment plants that do not have primary treatment to minimized clogging of downstream liquid and solid processes.

Fine screens have been used for “effluent polishing” which increases secondary effluent to tertiary effluent quality. They also are installed upstream of the trickling filters to minimize clogging and fouling of distributor nozzles. In addition to the vertical or inclined bars, mechanical bar screens are equipped with rakes or some type of cleaning mechanism for removing collected debris from the face of the unit. Once screenings are collected from the unit, they are usually dewatered and hauled away to a landfill.

## WASTEWATER PROJECTS AND FACILITIES:

Changes are underway for the Cherokee Metropolitan District’s form of wastewater treatment. The District’s current aerated lagoon system is located south of Highways 24/94 and west of Peterson Road. This facility has a surface water discharge that is directed to the East Fork of Sand Creek.



## **NEW FACILITY LOCATION:**

The District currently provides wastewater treatment service to Schriever Air Force Base through an interconnecting 14-inch pipeline. This line has been sized so that Cherokee can reverse the flow in the main and pump its untreated wastewater to the east. The District purchased a quarter section of undeveloped land - 165 acres - located north of Drennan Road and immediately east of Milne Road for the construction of a new mechanical wastewater treatment facility.

The District's compliance schedule established by the State Health Department has been modified to allow our current discharge to continue while we build a new facility at this location. The new facility has several advantages over the existing facility: providing significantly enhanced levels of treatment; eliminating the incompatibility of the current facility with the urbanized area; eliminating potential waterfowl conflicts and providing an opportunity for the District to effectively recover water resources currently being lost.

## **COST:**

To help make the project cost effective, Cherokee has entered into an Intergovernmental Agreement with the Meridian Service Metropolitan District (MSMD), whereby the MSMD will be a bulk wastewater user of the treatment facility. The MSMD will be required to pay a proportionate share in both the capital construction and operation costs of the facility. Cherokee will retain ownership of the facility, but the MSMD will fund 45.8% of the costs. This will achieve an economy of scale resulting in lower construction and operating costs for both Districts.

## **REPLACEMENT FACILITY:**

Cherokee is also working on a project to recapture the treated water flow discharged from the treatment plant and transfer it to a Replacement Facility, located southeast of the wastewater treatment facility, yet within the UBS. At this location, it will be placed in a series of basins where it will naturally infiltrate the underlying sands and gravels, ultimately recharging the alluvial aquifer. This approach will allow the District to take advantage of not only the natural treatment occurring as the water passes through the sands and gravels, but it will also replenish the alluvial aquifer itself. This part of the project is considered crucial to ensure the long-term viability of the District's current source of water in the Upper Black Squirrel (UBS) Aquifer.

The technology being used has been proven in many other communities throughout the Southwest and West Coast, but it will be a first in Colorado. This is an exciting time for Cherokee and its constituents as our water resources program takes treatment to a much higher level and we position ourselves to more effectively utilize our most valuable resource-water.

## **WASTEWATER TREATMENT:**

Cherokee Metropolitan District's wastewater treatment facility went into operation in June 2010 and sits on a 160-acre parcel, which is located approximately 20 miles east of Cimarron Hills. The plant's actual foot print is roughly 26 of the 160-acre total.



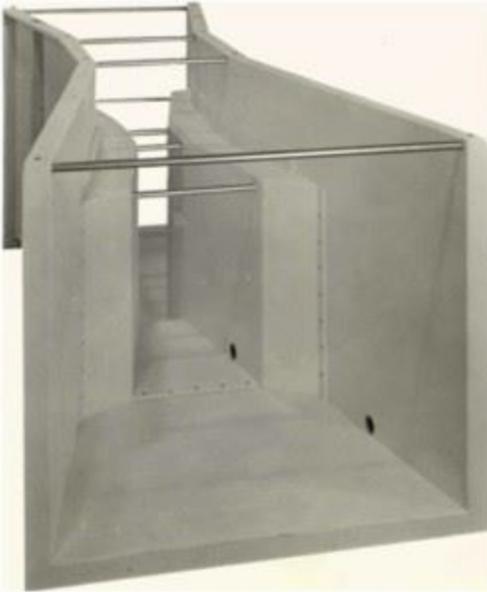
### **RATE CAPACITY:**

The plants design rate capacity is 4.8 million gallons per day (MGD), at the present time the plant receives 1.5 MGD. The wastewater that the plant takes in daily is a combination from three contributors. The largest of these three is Cherokee Metropolitan District with an average flow of 1.2 MGD, Meridian Service Metropolitan District is next with 0.18 MGD and lastly is Schriever Air Force Base with their flow of 0.13 MGD.

## TREATMENT PLANT AMENITIES:

The treatment plant consists of an 'Influent' building, four 'Sequential Batch Reactors' (SBR's), three 'Aerobic Digesters' (AD's), 'Blower' and 'Operations' building,' Solids Handling' building (i.e. Biosolids), two 'Equalization Basins' (EQ) and a 'Effluent' building that contains the 'Ultraviolet Light Disinfection' (UV) unit. The treated effluent then leaves the plant and continues five miles to the 'Rapid Infiltration Basins'. This is an overall general description of the plant with explanations of the individual components that make up the wastewater treatment to come in the future.

## WASTEWATER TECHNOLOGY:



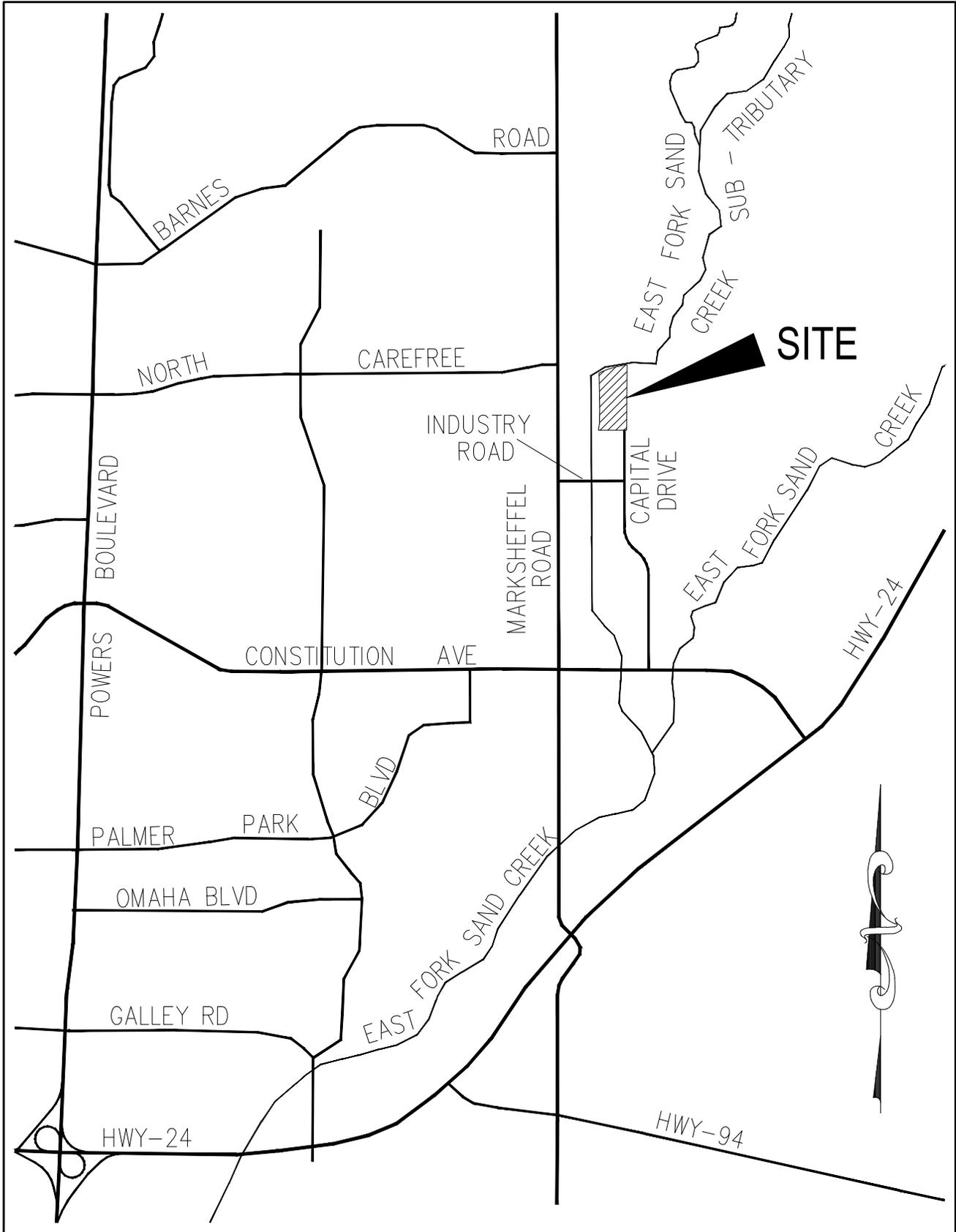
These two photos are of Parshall Flumes, one is a newly manufactured flume, and the one on the right is the flume that is in use at the wastewater treatment facility, located in the Influent building. Parshall flumes are a fixed hydraulic structure commonly used to measure municipal sewer flows. They can vary in size depending on the design capacities of a plant. The plant's flume is an 18 inch and at the time the photo was taken the flow was at 1,042 gallons per minute (gpm) or 1.5 million gallons a day.

## MEASURING THE FLOW:

We have two ways of measuring flows with the Parshall flume one is by a staff gauge that is mounted inside the flume that shows inches of flow. These inches correspond with a chart, which cross references the inches with flow in gallons per minute (gpm) and million gallons per day (MGD). The other device is an Ultra Sonic flow measuring sensor that also measures the inches of flow and sends the data to our 'Supervisory Control and Data Acquisition' (SCADA) system located in the operations building. The Ultra Sonic device is gray and is at the top middle of the right hand photo.

## **APPENDIX**

**VICINITY MAP**



# VICINITY MAP

N.T.S.

**PLAT MAP**



**INTENT TO SERVE LETTER**



# CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842

Telephone: (719) 597-5080 Fax: (719) 597-5145

December 30<sup>th</sup>, 2019  
M&S Civil Consultants  
Attn: Georgianne Willard  
102 E. Pikes Peak Ave, Suite 500  
Colorado Springs, CO 80903

*Sent via email: [georgianne@mscivil.com](mailto:georgianne@mscivil.com)  
Original to follow by US Mail*

Re: Water and Sewer Service to DWIRE Storage Yard Development  
Commitment Letter No. **2019-08**

Dear Georgianne Willard,

As requested, this document will serve as a formal Letter of Commitment from the Cherokee Metropolitan District to provide municipal water and sewer services for the DWIRE Storage Yard Development, located at the east side of the intersection of Industry Road and Capital Drive. The proposed location for this development is located within the District's established boundaries and therefore is eligible for service connections from the District.

Cherokee Metropolitan District staff, along with the developer, have preliminarily determined that the following will be the total water demand required by this occupancy:

Type of Use	Demand (AF/yr)
Domestic	13.7
Irrigation	2.0
<b>Total</b>	<b>15.7</b>

This water commitment is hereby made exclusively for this specific development project at this site within the District. If planned structures in this development exceed this water allocation, the development owner must apply for a new commitment. To confirm this commitment you must provide the District with a copy of the final plat approval from El Paso County Development Services within 12 months of the date of this letter. Otherwise, the District may use this allocation for other

developments requesting a water commitment. If the subject project is re-platted, you must submit a new commitment request prior to submitting the re-plat to El Paso County, which may result in a recalculation of the water demand for the project.

If I may be of further assistance please contact me at your convenience.

Sincerely,

A handwritten signature in cursive script, appearing to read "Amy Lathen", written over a horizontal line.

Amy Lathen  
General Manager

Cc: Peter Johnson; Water Counsel w/ encl: sent via email  
Steve Hasbrouck; Board President w/ encl: sent via email  
Jeff Munger, Water Resource Engineer  
Kevin Brown; Jr. Engineer