

**Construction Best Management Practices (BMP) Plan Report
For
COTTONWOOD WATER &
SANITATION DISTRICT**

ARAPAHOE WELL D-1R REDEVELOPMENT PROJECT

Applicant:

Cottonwood Water and Sanitation District
c/o Mulhern MRE, Inc.
188 Inverness Dr West, Suite 140
Englewood, CO 80112

Engineer:

Mulhern MRE, Inc.
188 Inverness Drive West, Suite 140
Englewood, Colorado 80112
Phone: 303-649-9857
Contact: Luis Tovar

March 25, 2020

Cottonwood Water and Sanitation District WISE Local Connection

1. Owner/Engineer:
Cottonwood Water and Sanitation District
188 Inverness Drive West, Suite 140
Englewood, Colorado 80112
Phone: 303-649-9857
Contact: Luis Tovar

2. Project Description:

The proposed project includes the redevelopment of an Arapahoe Aquifer well, Well D-1, of approximately 1,700 feet deep. Well D-1R is one of the District's main sources of water supply and has been in operations since 1986. This well is located approximately 1,000 feet north of Cottonwood Drive and Cherry Creek, just east of Cherry Creek. However, after many years of service, its screens which are located approximately 1,600 feet below the surface, failed to the extent that repairing them was not economically feasible. In order to replace Well D-1R, Cottonwood will drill a new well, Well D-1RR, approximately 75 feet south of the existing Well D-1R as shown on Contraction Drawings. The well site is located in Section 4, Township 6 South, Range 66 West, in Douglas County. There will be a small section of pipeline required to reconnect the new well to the existing raw water collection system owned and operated by Cottonwood Water and Sanitation District ("Cottonwood"). The waterline will be constructed within an existing easement, Rec. 200609510. In addition, the improvements will take place within a property owned by the Cottonwood Metropolitan Improvement District "Cottonwood Metro", a portion of Cottonwood Filing #1, Tract A (east side of Cherry Creek, just north of Cottonwood Drive).

The new well, Well D-1RR, will be developed with a drill rig equipped to reach depths between 1,600 to 1,800 feet deep and its operations must be continuous during this process to prevent a collapse of the circular shape of the well as it is being drilled. Due to this condition, the drilling operations shall occur 24-hours a day, 7 days a week for a period estimated not to exceed 33 days. The short section of pipeline will be constructed by means of open trench. The proposed line will be installed 4 ½ feet, to the top of pipe, below the existing grade and should be completed within a week. The project will result in a temporary disturbance of approximately 0.77 of land area. However, it is anticipated that the ground disturbance would be limited to the footprint of the drilling equipment and the pipeline trench.

It is expected that the proposed CBMP plan can function throughout the project. The first part of the project will be to drill the well at which time there is not any excess of material on the ground surface expected at all. Upon completion of the well, the short section of water line will be installed and any excess of soil will be hauled off site and disposed of at a CBPM approved location. Once the water line is installed, the site will be restored to the existing grades and complete ground restoration shortly after.

The development of the well is expected to begin in June 2020 and be fully operable by early August of 2020, just in time for the high demand season.

3. Existing site conditions:

The entire project is located within Douglas County and the project area falls within the limits of the Town of Parker. The project starts and ends in the open space, east of Cherry Creek, between Arapahoe/Douglas County Line and Cottonwood Drive. The existing vegetation consists of dry land and irrigated grasses over the entire project area and a small portion of crusher-fine trail owned by the Cottonwood Metro.

4. Adjacent Areas:

The new Well D-1RR and pipeline will be located in an open space within Cottonwood Filing #1, Tract A. In addition, to the west of the alignment is Cherry Creek and to east is Cottonwood Subdivision # 1.

5. Soils:

Within the Town of Parker, the native soils along the alignment of the pipelines consist of the Bresser Series (hydrologic soil group B), and mostly loamy alluvial land within or near the floodplain. The Bresser Series are sandy loams to sandy clay loams with moderate permeability. The alluvial loams tend to be a dark-colored sandy loam or loam near floodplains. The erosion hazard is slight to moderate. However, surface runoff is slow due to the flat grades within the project area.

6. Areas and Volumes:

No spoils are expected from the development of the well. Both the new well and the pipeline trenching activities is planned within a 30-foot wide area (existing CWSD utility easement). The total area of land expected to be disturbed during construction is approximately 0.73 acres. The disturbed area will be limited through use of Sediment Control Logs (“SCL”). The net export of soil material from the installation of the water line is estimated to be 12 CY for this project. Final grades will remain the same as those prior to construction.

7. Erosion and Sediment Control Measures:

At the start of the project, BMP facilities will be installed prior to the installation of the pipelines. These items include SCL and Construction Fence (“CF”) along the perimeter of the project. Two vehicle tracking control BMPs (“VTC”) will be located at the north-east end of the well site and one next to the crusher-fine trail just before construction vehicles exit to Junegrass. The existing trail connects to Junegrass Place located to the north-east of the project. All SCLs will be installed as shown on the plans and will remain in place from the beginning of the project until native vegetation has been established and approved by the ToP. In addition, due to the size of the well rig, a Temporary Stream Crossing (“TSC”)

will be installed upstream of the existing creek crossing. The TSC will be placed and maintain per the Douglas County GESC requirements for TSC. Furthermore, the location of the propose TSC does not encroach any wetlands, Preble's Mouse habitat or the Riparian Conservation Zone delineated for this section of Cherry Creek. TSC will be a Type Ford crossing with 3 – 6" diameter ductile iron pipe. The existing stream crossing for the trail system has a 12" Corrugated Storm Pipe.

Once construction is complete, the VTCs will be removed as well as the SCL and TSC as shown on the CBMP plans. Then, surface stabilization will be installed in a timely manner. Seeding, Mulching and Crimping will be installed in all disturbed areas. In addition, disturbed sections of the private trail will be restored to an original or better condition as soon as the pipelines are installed.

8. Timing/Phasing Schedule

Installation of the initial erosion and sediment control measures will be completed prior to any construction activities, which are tentatively planned to commence in late June of 2020 and end approximately two month later.

9. Permanent Stabilizing

The site will ultimately be permanently stabilized by seeding and mulching over the disturbed areas. Through easement agreements with the Cottonwood Metro, the permanent restoration of the areas within the limits of construction will be as close as reasonably possible to the condition prior to the disturbance, which will involve dryland grasses.

10. Stormwater Management Considerations

Stormwater management during construction of the project will be handled locally by placing any excavated materials uphill (when possible) from trenches for the 80 feet of water line. The possibility of sediment run-off into the existing ditch north of the site or Cherry Creek located east of the site will be managed with Sediment Control Logs. A Concrete Washout Area will be placed just south-west of the VTC within the well site which will be contained by a Silt Fence.

11. Maintenance

The contractor, through the contract documents for this project, is required and will perform all maintenance of the CBMPs until re-establishment of groundcover is approved by the Town of Parker. None of these BMPs will require any special maintenance instructions other than those in the standard notes and details.

12. Engineer's Cost Estimate for Installation of BMPs

As required by Town of Parker, attached are cost estimates for the installation and maintenance of the CBMPs. They are provided for information only and are based on unit costs assigned by the Town.

CWSD - ARAPAHOE WELL D-1RR PROJECT

Town of Parker CBMP Cost Opinion Spreadsheet

Sept. '13

BMP No.	BMP	ID	Unit	Installation Unit Cost	Quantity	Cost
1	Check Dam	CD	LF	\$ 30.00		\$ -
2	Concrete Washout Area	CWA	EA	\$ 750.00	1	\$ 750.00
3	Construction Fence	CF	LF	\$ 2.00	506	\$ 1,012.00
4	Culvert Protection	CP	EA	\$ 120.00	2	\$ 240.00
5	Detention Pond Protection	DP	EA	\$ 180.00		\$ -
6	Dewatering	DW	EA	\$ 650.00		\$ -
7	Debris Trash Control	DC	HR	\$ 40.00	30	\$ 1,200.00
8	Diversion Ditch	DD	LF	\$ 2.00		\$ -
9	Erosion Control Blanket	ECB	SY	\$ 2.10		\$ -
10	Inlet Protection, Curb on Sump	IPCOS	EA	\$ 300.00		\$ -
11	Inlet Protection, For Area Inlets Not In Pavement	IPAN	EA	\$ 290.00		\$ -
12	Inlet Protection, For Area Inlets In Pavement	IPAP	EA	\$ 350.00		\$ -
13	Inlet Protection, Curb on-Grade	IPCOG	EA	\$ 180.00		\$ -
14	Lot Protection	LP	EA	\$ 800.00		\$ -
15	Masonry Work Protection	MWP	EA	\$ 250.00		\$ -
16	Portable Toilet Protection	PTP	EA	\$ 75.00		\$ -
17	Rough Cut Street Control	RCSC	EA	\$ 100.00		\$ -
18	Rock Sock	RS	LF	\$ 15.00		\$ -
19	Rock Sock in Swale	RSS	LF	\$ 20.00		\$ -
20	Starw Bale	SB	EA	\$ 20.00		\$ -
21	Temporary Sediment Basin	TSB	EA	\$2,500.00		\$ -
22	Sediment Control Log	SCL	LF	\$ 3.00	466	\$ 1,398.00
23	Silt Fence	SF	LF	\$ 1.25	64	\$ 80.00
24	Surface Roughening	SR	AC	\$ 175.00		\$ -
25	Sidewalk Transition protection	STP	EA	\$ 100.00		\$ -
26	Stabilized Staging Area	SSA	EA	\$ 500.00	1	\$ 500.00
27	Vehicle Tracking Control-VTC w/Jersey Barriers	VTC	EA	\$1,750.00	2	\$ 3,500.00
28	Temporary Irrigation	TI	EA			\$ -
29	Temporary Stream Crossing (per Douglas County GESC)	TSC	EA	\$ 1.00	1000	\$ 1,000.00
TOTAL						\$ 9,680.00

12. Calculations

No calculations required at this time.

13. Additional information:

No additional information is required at this time.