1041 PERMIT APPLICATION SUBMITTAL
FOR
ARROWHEAD MOBILE HOME PARK
LIFT STATION

OCTOBER 2018

EE JOB NO.: 0013.0001

ELEMENT
ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

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RESPONSES TO CHAPTER 2, ARTICLE 3 PARAGRAPH 2.303 – SUBMISSION REQUIREMENTS OF THE COUNTY QUIDELINES

SECTION 2.303 (1) COMPLETED APPLICATION FORM

The completed application form can be seen in Exhibit B.

SECTION 2.303 (2) ADDITIONAL REQUIRED INFORMATION

The Director may require submission of any plan, study, survey or other information, in addition to the information required by this Section, at the applicant's expense, as in the Director's judgment is necessary to enable it to review and act upon the application.

To be determined by Director.

SECTION 2.303 (3) MINERAL RIGHTS

Any application which requires compliance with § 24-65.5-101, et seq., C.R.S., (Notification to Mineral Owners of Surface Development) shall not be considered to have been submitted as complete until the applicant has provided a certification signed by the applicant confirming that the applicant or its agent has examined the records of the El Paso County Clerk and Recorder for the existence of any mineral estate owners or lessees that own less than full fee title in the property which is the subject of the application, and stating whether or not any such mineral estate owners or lessees exist. In addition, for purposes of the County convening its initial public hearing on any application involving property which mineral estate owners or lessees owning less than full fee title in the property have been certified by the applicant to exist, the application shall not be considered to have been submitted as complete until the applicant has provided an additional signed certification confirming that the applicant has, at least 30 days prior to the initial public hearing, transmitted to the County and to the affected mineral estate owners and lessees the notices required by C.R.S. §24- 65.5-101, et seq.

Based on an examination of the records of the Clerk and Recorder's Office, no mineral estate owners were found. Confirmation of this can be seen in Exhibit C.

SECTION 2.303 (4) INFORMATION DESCRIBING THE APPLICANT

2.303 (4a): *The names, addresses, including email address and fax number, organizational form, and business of the applicant and, if different, the owner of the Project.*

Owner:
Dayton and Leah Orsburn – Co-Trustees
P.O. Box 154
Chino Hills, CA 91709
daytonorsburn@me.com
909-576-1324

Applicant:
Arrowhead Mobile Home Park
75 North Curtis Road
Colorado Springs, CO 80930
719-683-2727

Engineer:
Element Engineering, LLC
12687 West Cedar Drive, Suite 300
Lakewood, CO 80228
courtneyh@elementengineering.net
303-242-9992

2.303 (4b): *The names, addresses and qualifications, including those areas of expertise and experience with projects directly related or similar to that proposed in the application package, of individuals who are or will be responsible for constructing and operating the Project.*

The names, addresses, and qualifications of the contractor for the construction of the project will be provided after it is determined for the project (a contractor has not been selected). Prior to selecting a contractor, CDPHE approval must be obtained. CDPHE approval cannot be obtained until the 1041 process is completed.

The operator for the project is Paul E. Grant II. Paul E. Grant II is a contract operator who lives in Colorado Springs, CO who has a Level B Wastewater Treatment Certification. His phone number is 719-303-0411.

2.303 (4c): *Written authorization of the application package by the Project owner, if different than the applicant.*

The owner is the legal representative of the applicant and is who signed the application and therefore authorizes the application package as seen in Exhibit B.

2.303 (4d): *Documentation of the applicant's financial and technical capability to develop and operate the Project, including a description of the applicant's experience developing and operating similar projects.*

The residents of the Arrowhead Mobile Home Park are currently charged for sewer usage as part of the monthly lot fee for the Mobile Home Park. Since the charges for sewer usage are part of the monthly lot fees and the mobile home park is privately owned, the owner does not monitor the current annual operating costs. The owner will privately fund the project and will increase lot rent fees as necessary to support the project. The proposed project will replace an existing unpermitted wastewater treatment plant. The operations and maintenance costs associated with the proposed lift station are expected to decrease compared to the existing facility; however, this cannot be ensured since the owner does not currently maintain an operating budget for the existing facility. It is expected that the annual operating expenses will be $3,400, which includes operating the lift station and the monthly fees from Cherokee Metropolitan district. There will be additional charges not account for in the $3,400 but already being paid by the residents to maintain the current operator as the Operator in Responsible Charge for the lift station.

2.303 (4e): *Written qualifications of report preparers.*

The Element Engineering team has had experience with completing the 1041 process. These projects have included lift stations and water treatment plants. The team has also completed numerous other similar projects that have gone through the State of Colorado permitting process.

Nick Marcotte, P.E.
President

Nick Marcotte has over 11 years of experience providing permitting, design, and construction management services for rural towns, cities, and special districts throughout Colorado, Kansas, Wyoming, and Washington. He has specialized expertise in water and wastewater infrastructure and treatment planning, design, CDPHE permitting, hydraulics, municipal infrastructure, master planning, environmental processes, and acquisition of grants and loans to fund various projects.

Courtney Husted, EIT
Project Engineer

Courtney has over 4 years of experience in Civil Engineering including wastewater treatment and collection design, water treatment and distribution design, contract documents, and grant funding assistance and coordination.

The complete resumes of the report preparers are included in Exhibit D.

SECTION 2.303 (5) INFORMATION DESCRIBING THE PROJECT

2.303 (5a): *Vicinity map showing the proposed site and the surrounding area.*

A vicinity map of the project, which shows the location of the Cherokee Metropolitan District, the project location, and Cherokee Metropolitan Districts Black Squirrel WWTF and Rapid Infiltration Gallery can be seen in Exhibit E.

2.303 (5b): *Executive summary of the proposal indicating the scope and need for the Project.*

The existing Arrowhead Mobile Home Park (AMHP) Wastewater Treatment Plant (WWTP) consists of a two-cell aerated chamber system with a small settling chamber that discharges to a two-cell unlined lagoon that functions as an infiltration basin. The WWTP is currently in non-compliance because there is no state approved discharge permit allowing discharge to groundwater in this manner. Furthermore, the existing facility will not be capable of treating to stringent effluent groundwater nutrient limits. The proposed project includes the complete decommissioning of the existing AMHP WWTP and the construction of a lift station that will consolidate AMHP with the neighboring Cherokee Metropolitan District (CMD). As part of this project, AMHP has submitted all necessary paperwork to be officially included as an in-district customer of CMD. All of the flows that are received by the current WWTP will be received by the proposed lift station and pumped to the Cherokee Metropolitan District collection system. The existing flow rates are assumed to be approximately 0.0075 MGD. This is based on an estimated 139 gallons per mobile home per day. The existing WWTP encompasses approximately 0.95 acres, which will be decommissioned. The proposed lift station will encompass approximately 0.01 acres.

The proposed lift station will be located on AMHP property, adjacent to the existing WWTP so that the existing collection system can be utilized. The lift station will be located at the southwest corner of the current AMHP WWTP. It will pump to CMD's gravity sewer main that runs along North Curtis Road. Once it joins with the CMD collection system, it will be treated at the Cherokee Metropolitan District Water Reclamation Facility, which is comprised of the Black Squirrel WWTF and Rapid Infiltration Basin Facility and discharges to groundwater. The Cherokee Metropolitan District Water Reclamation Facility is designed to treat 4.8 MGD. The AMHP will add approximately 0.2% to the flows experienced at CMD. CMD will not need to be upgraded or enlarged to accommodate the additional flows.

It is anticipated that the lift station will be constructed in the spring of 2019 with an anticipated construction time of 5 months.

2.303 (5c): *Plans and specifications of the Project in sufficient detail to evaluate the application against the applicable Review Criteria.*

The plans for the Project are included in Exhibit F. The specifications can be seen in Exhibit G.

2.303 (5d): *Descriptions of alternatives to the Project considered by the applicant. If the Director determines that the nature or extent of the proposal involves the potential for significant damage and warrants examination of other specific, less damaging alternatives, the Director may require the applicant to evaluate and present information on such additional alternatives as part of the application.*

Several alternatives were analyzed by the applicant for this Project. The first alternative was to improve the existing facility and obtain a discharge permit for the facility. This was determined to not be feasible because the existing facility will be unable to meet groundwater discharge limits. The next alternative that was considered by was to install evaporation ponds where the current wastewater treatment plant is located. A Site Application was submitted with evaporation ponds being the proposed treatment. During a meeting with the Pikes Peak Area Council of Governments Site Application Review Committee, it was determined that there is a main sewer line that runs along North Curtis Road (approximately 820 ft from the existing wastewater treatment facility) to the Cherokee Metropolitan District (CMD) Water Reclamation Facility (WRF). After conversations with CMD, it was determined that the AMHP would be allowed to consolidate with CMD and be included at in-district rates. This was finalized on March 13, 2018 as Resolution 2018-03, which is included in Exhibit H. Since AMHP is now considered in-district for CMD, the currently proposed project of installing a lift station to consolidate became a feasible alternative and was determined to be the best alternative for AMHP. Consolidation with CMD requires installation of a lift station at the end of the AMHP collection system to convey wastewater into the CMD collection system. The proposed lift station to allow for consolidation is the proposed project.

2.303 (5e): *Schedules for designing, permitting, constructing and operating the Project, including the estimated life of the Project.*

The proposed schedule for the Project can be seen in the table below.

Task	Start Date	End Date
Complete and Submit 22.7 Site Application to CDPHE	--	06/15/18
CDPHE Review and Approval of Site Application	06/15/18	10/31/18
Complete and Submit Basis of Design Report, 100% Plans and Specs to CDPHE	06/15/18	11/15/18
CDPHE Review and Approval of Basis of Design Report, 100% Plans and Specs	11/15/18	01/15/19
Project Bidding	01/15/19	02/15/19
Construction	03/01/19	07/31/19

The lift station has an expected life of 20 years, but the pumps will likely need to be replaced every 10 years.

2.303 (5f): *The need for the Project, including a discussion of alternatives to the Project that were considered and rejected; existing/proposed facilities that perform the same or related function; and population projections or growth trends that form the basis of demand projections justifying the Project.*

The AMHP is currently under a Notice of Violation/Cease and Desist Order (NOV/CDO) because the existing wastewater treatment plant is operating without a discharge permit. The existing facility will be unable to meet groundwater discharge limits; therefore, a new treatment facility is necessary. The first alternative that was considered was evaporation ponds on the site of the existing wastewater treatment plant. After being informed at the Pikes Peak Area Council of Governments Site Application Review Committee meeting that CMD has a sewer main the runs approximately 820 ft from the current wastewater treatment plant, it was determined that the most feasible alternative was to consolidate with CMD. This requires a lift station from the end of the AMHP collection system to tie into the CMD collection system.

The AMHP is at full build out; therefore, there is no expected growth that will change the demand at the lift station.

2.303 (5g): *Description of relevant conservation techniques to be used in the construction and operation of the Project.*

Best management practices will be followed for the construction of the lift station. This includes storm water/drainage conservation techniques.

2.303 (5h): *Description of demands that this Project expects to meet and basis for projections of that demand.*

The proposed lift station is designed to convey an average wastewater flow of 7,500 gpd (5.21 gpm) with a peak hour flow of 30,000 gpd (20.83 gpm). Because CMD is currently operating under a Compliance Order on Consent (COC) due to high TDS concentrations, CDPHE is also requiring AMHP to backwash with approximately 5,000 gpd (3.47 gpm) of water to decrease the average TDS to below 400 mg/L. Due to the available pump sizes, the lift station will pump at 35 gpm, which is a higher flow rate than is required to handle peak hour flows and the backwash flow (total of 24.3 gpm required). The AMHP is at full build out; therefore, the current design flow is equivalent to the future flow. A more detailed explanation of the flow rates and how the lift station will operate can be seen in the Site Application that can be seen in Exhibit I.

2.303 (5i): *List of adjacent property owners and their mailing addresses.*

Adjacent property owners are as follows:

Owner:	Joseph P. and Ruth C. Davis
Location:	15-14-64
Mailing Address:	18250 Sweet Road Peyton, CO 80831

Owner:	Michael Hendrix
Location:	65 N Curtis Rd
Mailing Address:	26852 Oak Hollow Rd Laguna Hills, CA 92653

Owner:	Dennis L. Hester
Location:	75 S. Curtis Rd.
Mailing Address	75 S. Curtis Rd. Colorado Springs, CO 80930

Owner:	Phyllis M. Washington
Location:	14375 Highway 94
Mailing Address:	14375 Highway 94 Colorado Springs, CO 80929

SECTION 2.303 (6) PROPERTY RIGHTS, OTHER PERMITS, AND APPROVALS

2.303 (6a): *Description of property rights that are necessary for or that will be affected by the Project, including easements and property rights proposed to be acquired through negotiation or condemnation.*

The proposed project will take place on the Arrowhead Mobile Home Park property and will cross the Right of Way to connect with the CMD sewer main. No additional property will be required to complete the project.

2.303 (6b): *A list of all other federal, state and local permits and approvals that will be required for the Project, together with any proposal for coordinating these approvals with the County permitting process. Copies of any permits or approvals related to the Project that have been granted.*

Below is a list of federal, state and local permits and approvals that will be required:

- CDPHE Approval of Design
- Work Within Right of Way Permit
- Activity Permit from EPC
- Building Permit from Pikes Peak Regional Building Department

2.303 (6c): *Copies of relevant official federal and state consultation correspondence prepared for the Project; a description of all mitigation required by federal, state and local authorities; and copies of any draft or final environmental assessments or impact statements required for the Project.*

The Site Application for the project, which was submitted to CDPHE, is included in Exhibit I.

SECTION 2.303 (7) LAND USE

2.303 (7a): *Provide a map at a scale relevant to the Project and acceptable to the Department describing existing land uses and existing zoning of the proposed Project area and the Project service area, including peripheral lands which may be impacted. The land use map shall include but need not necessarily be limited to the following categories: residential, commercial, industrial, extractive, transportation, communication and utility, institutional, open space, outdoor recreation, agricultural, forest land and water bodies. Show all special districts (school, fire, water, sanitation, etc.) within the Project area.*

A land use map is attached in Exhibit J. According to this map and the El Paso County Assessor, the AMHP is Zoned as Residential Rural-5.

The AMHP is located within the Ellicott Fire Protection District and the Ellicott School District, as show in the maps attached in Exhibit K, which were taken from the 2003 Highway 94 Comprehensive Plan.

The AMHP is considered to be in district for the Cherokee Metropolitan District on March 13, 2018 as Resolution 2018-03, which is included in Exhibit H.

2.303 (7b): *All immediately affected public land boundaries should be indicated on the map. Potential impacts of the proposed development upon public lands will be visually illustrated on the map as well as described in the text.*

There are no known public lands other than the public right of way (North Curtis Road) that is adjacent to the property.

2.303 (7c): *Specify whether and how the proposed Project conforms to the El Paso County Master Plan.*

The El Paso County Master Plan is made up of several smaller master plans combined. The proposed project falls under the 2003 Highway 94 Comprehensive Plan. Goal 10 of the 2003 Highway 94 Comprehensive Plan states that consolidation should be encouraged. The proposed project achieves that goal by consolidating with Cherokee Metropolitan District. Also, per the El Paso County Policy Plan, section 10.1.5, interconnection to regional wastewater system is encouraged. The proposed project complies with that by consolidating with Cherokee Metropolitan District.

2.303 (7d): *Specify whether and how the proposed Project conforms to applicable regional and state planning policies.*

This project is in general conformance with all known regional and state planning policies.

2.303 (7e): *Specify whether and how the proposed Project conforms to applicable federal land management policies.*

The project does not involve any federal lands.

2.303 (7f): *If relevant to the Project design, describe the agricultural productivity capability of the land in the Project area, using Soils Conservation Service soils classification data.*

The NRCS soils classification map of the Arrowhead Mobile Home Park Area can be seen in Exhibit L. As seen, the area is mostly Ascalon sandy loam.

2.303 (7g): *Describe the probability that the Project may be significantly affected by earthquakes, floods, fires, snow, slides, avalanches, rockslides or landslides and any measures that will be taken to reduce the impact of such events upon the Project.*

The project location is not identified as a high hazard site.

2.303 (7h): *Specify if excess service capabilities created by the proposed Project will prove likely to generate sprawl or strip development.*

The proposed project is designed for the wastewater flows from the Arrowhead Mobile Home Park. The design does not account for excess flows, so additional sprawl or development is unlikely.

2.303 (7i): *Specify whether the demand for the Project is associated with development within or contiguous to existing service areas.*

The proposed project is not associated with any development. The project is proposed because the existing wastewater treatment facility for the Arrowhead Mobile Home Park is under a Notice of Violation/Cease and Desist Order and cannot continue to operate as it does currently. The wastewater for the mobile home park must be collected and treated prior to discharge. The proposed lift station will allow the wastewater from the mobile home park to be collected and treated at the Cherokee Metropolitan District Water Reclamation Facility. There is no expected expansion at the mobile home park because the mobile home park is at full build out.

SECTION 2.303 (8) SURFACE AND SUBSURFACE DRAINAGE ANALYSIS

2.303 (8): *The applicant shall supply a surface and subsurface drainage analysis.*

A drainage analysis is included in Exhibit M. The plans have also been updates to include erosion control as shown in Exhibit F.

SECTION 2.303 (9) FINANCIAL FEASIBILITY OF THE PROJECT

2.303 (9a): *Relevant bond issue, loan and other financing approvals or certifications (ex: approved bond issues; bond counsel opinion).*

The lift station is estimated to cost $121,592. The AMHP will pay for the project through private funds. The owner will increase the lot rent fees to compensate for the project cost.

2.303 (9b): *Business plan that generally describes the financial feasibility of the Project.*

The owner of AMHP can privately fund the project and will increase lot rent fees to repay the private funding of the project over time.

SECTION 2.303 (10) LOCAL INFRASTRUCTURE AND SERVICES IMPACTS

2.303 (10): *An impact analysis that addresses the manner in which the applicant will comply with the relevant Permit Application Review Criteria. The impact analysis shall include the following information: description of existing capacity of and demand for local government services including but not limited to roads, schools, water and wastewater treatment, water supply, emergency services, transportation, infrastructure, and other services necessary to accommodate the Project within El Paso County.*

The project is a lift station to consolidate with Cherokee Metropolitan District. The flows from the AMHP will increase the flows currently seen at the Cherokee Metropolitan District Water Reclamation Facility (CMD WRF) by approximately 0.2%. This slight impact is not expected to impact the wastewater treatment at the CMD WRF. The project will not impact the roads, schools, water treatment, water supply, emergency services, transportation, infrastructure, or any other services.

SECTION 2.303 (11) RECREATION OPPORTUNITIES

2.303 (11): *Description of the impacts and net effect of the Project on present and potential recreational opportunities.*

There are no anticipated impacts to present or potential recreational opportunities.

SECTION 2.303 (12) AREAS OF PALEONTOLOGICAL, HISTORIC OR ARCHEOLOGICAL IMPORTANCE

2.303 (12): *Description of the impacts and net effect of the Project on sites of paleontological, historic or archaeological interest.*

It is not anticipated that artifacts of paleontological, historic, or archeological importance will be uncovered during this project; however, if any are uncovered during construction, the appropriate authorities will be notified.

SECTION 2.303 (13) NUISANCE

2.303 (13): *Descriptions of noise, glare, dust, fumes, vibration, and odor levels anticipated to be caused by the Project.*

There will be temporary nuisances including but not limited to noise, dust, fumes, and vibrations during construction due to the required equipment and earthwork that will be required for construction. These are anticipated to be minimal since the project is small.

The project will have a long term odor nuisance due to the project being a wastewater lift station. This is mitigated by the design limiting the amount of time the wastewater sits in the lift station wet well. At average day flows, the wastewater will sit for approximately 36 minutes between pumping cycles. This is less than the maximum allowable detention time of 60 minutes per CDPHE design criteria, which will help limit the odor nuisance. The CDPHE Regulation 22 sets a setback distance for enclosed lift stations of 100 ft. The closest mobile home is approximately 175 ft from the lift station, which is farther than the minimum setback distance. The location of the lift station is also adjacent to the existing wastewater treatment facility. It is not expected that the odor for the lift station will be more of a nuisance than the residents currently experience from the wastewater treatment plant.

There are no expected long term nuisances due to noise, dust, fumes, or vibration from the project.

SECTION 2.303 (14) AIR QUALITY

2.303 (14): *Description of the impacts and net effect that the Project would have on air quality during both construction and operation, and under both average and worst case conditions, considering particulate matter and aerosols, oxides, hydrocarbons, oxidants, and other chemicals, temperature effects and atmospheric interactions.*

During construction, there will be temporary and typical impacts to air quality. These temporary impacts include but are not limited to equipment exhaust emissions, dust, and other chemical fumes. These impacts will be localized to the project site and will not have a permanent measurable effect on the air quality.

Operation of the lift station will not produce measurable negative effects to the air quality.

SECTION 2.303 (15) VISUAL QUALITY

2.303 (15): *Description of the impacts and net effect that the Project would have on visual quality, considering viewsheds, scenic vistas, unique landscapes or land formations within view of the Project area.*

The project will improve the visual quality of the project area by decommissioning the existing wastewater treatment facility and only having the top of the lift station with vents and a control panel visible. There are no known scenic vistas, unique landscapes, or land formations that will be impeded by the project.

SECTION 2.303 (16) SURFACE WATER QUALITY

2.303 (16a): *Map and/or description of all surface waters relevant to the Project, including description of provisions of the applicable regional water quality management plan, and NPDES Phase II Permit and necessary El Paso County Erosion and Stormwater Quality Control Permit ("ESQCP"), Section 404 Federal Clean Water Act Permit that applies to the Project and assessment of whether the Project would comply with those provisions.*

There are no surface waters relevant to the project.

Since the construction area for the project will be less than 1 acre, the NPDES Phase II Permit, ESQCP, and Section 404 Federal Clean Water Act Permit are not needed for the project.

2.303 (16b): *Existing data monitoring sources.*

There are no known data monitoring sources.

2.303 (16c): *Descriptions of the immediate and long-term impact and net effects that the Project would have on the quantity and quality of surface water under both average and worst case conditions.*

Since there are no surface waters relevant to the project, there are no immediate or long-term impacts and net effects that the project would have on the quantity and quality of surface water.

SECTION 2.303 (17) GROUNDWATER QUALITY

2.303 (17a) *Map and/or description of all groundwater, including any and all aquifers relevant to the Project. At a minimum, the description should include:*

(i) Seasonal water levels in each portion of the aquifer affected by the Project.

A geotechnical evaluation was completed by Kumar & Associates, Inc. on June 29, 2018. The report is attached in Exhibit N. According to the geotechnical report, groundwater was not encountered at the time of drilling or when checked 5 days later. It is anticipated, however, that the groundwater levels will fluctuate over time.

(ii) Artesian pressure in said aquifers.

Artesian pressures were not observed during the geotechnical evaluation.

(iii) Groundwater flow directions and levels.

Groundwater flow and direction were not evaluated in the geotechnical evaluation because groundwater was not encountered as seen in Exhibit N. The project is not anticipated to affect the groundwater flows or directions.

(iv) Existing aquifer recharge rates and methodology used to calculate recharge to the aquifer from any recharge sources.

An aquifer recharge rate was not observed in the project area. It is not anticipated that the project will impact storage capacity for aquifer recharge.

(v) For aquifers to be used as part of a water storage system, methodology and results of tests used to determine the ability of the aquifer to impound groundwater and aquifer storage capacity.

No aquifers will be used as part of a water storage system for this project.

(vi) Seepage losses expected at any subsurface dam and at stream aquifer interfaces and methodology used to calculate seepage losses in the affected streams, including description and location of measuring devices.

The project is not anticipated to come in contact with or affect any subsurface or stream-aquifer interfaces.

(vii) Existing groundwater quality and classification.

The groundwater in the area is EPA Class II – Potential or Current Drinking Water. The only treatment that is required in the area is disinfection. Water quality is generally good and meets state and federal drinking water standards.

(viii) Location of all water wells potentially affected by the Project and their uses.

A map of the wells within a 1-mile radius of the project is attached in Exhibit O. The closest well to the project is approximately 600 ft from the proposed lift station.

2.303 (18b): *Description of the impacts and net effect of the Project on groundwater.*

There is no anticipated negative impact of the project on groundwater. The project will improve the groundwater in the area by decommissioning the existing wastewater treatment plant, which will eliminate the unpermitted discharge of treated wastewater into the groundwater.

SECTION 2.303 (18) WATER QUALITY

2.303 (18a): *Map and/or description of existing stream flows and reservoir levels relevant to the Project.*

The project is not anticipated to affect existing stream flows or reservoir levels.

2.303 (18b): *Map and/or description of existing minimum stream flows held by the Colorado Water Conservation Board.*

There are no known Colorado Water Conservation Board studies that discuss minimum stream flows for the project area.

2.303 (18c): *Descriptions of the impacts and net effect that the Project would have on water quantity.*

The project is not anticipated to have any effect on water quantity.

2.303 (18d): *Statement of methods for efficient utilization of water, including recycling and reuse.*

The only water used for the project will be to dilute the wastewater to decrease the TDS concentration to below the effluent limit set for Cherokee Metropolitan District. This is a set amount of water that must be used and cannot be recycled or reused.

SECTION 2.303 (19) FLOODPLAINS, WETLANDS, RIPARIAN AREAS, TERRESTRIAL AND AQUATIC ANIMALS, PLANT LIFE AND HABITAT

2.303 (19): *Applicant shall only provide description of foregoing natural conditions, animal and plant life at, but not to exceed, the level of detail required by other federal or state Permits or reviews which are applicable to the Project.*

The FEMA FIRM map, the wetlands map, and the IPaC resource list are attached in Exhibit P. The project will not take place near any floodplains or wetlands. According to the IPaC resource list, there are 3 endangered species and 7 threatened species in the planning area, but there are no critical habitats near the project location.

SECTION 2.303 (20) SOILS, GEOLOGIC CONDITIONS AND NATURAL HAZARDS

2.303 (20a): *Map and/or description of soils, geologic conditions, and natural hazards including but not limited to soil types, drainage areas, slopes, avalanche areas, debris fans, mud flows, rock slide areas, faults and fissures, seismic history, and wildfire hazard areas, all as relevant to the Project area.*

According to the NCRS Soil map of the area, which is included as Exhibit L, the area soils are classified as sandy loam. There are no known geologic hazards on or adjacent to the project area.

2.303 (20b): *Descriptions of the risks to the Project from natural hazards.*

There are no known natural hazards that pose a risk to the project.

2.303 (20c): *Descriptions of the impacts and net effect of the Project on soil and geologic conditions in the area.*

There are no known impacts to the soil and geologic conditions because of the project.

SECTION 2.303 (21) HAZARDOUS MATERIALS

2.303 (21a): *Description of all solid waste, hazardous waste, petroleum products, hazardous, toxic, and explosive substances to be used, stored, transported, disturbed or produced in connection with the Project, including the type and amount of such substances, their location, and the practices and procedures to be implemented to avoid accidental release and exposure.*

The lift station will collect all of the wastewater from the Arrowhead Mobile Home Park, which is estimated to be an average of 7,500 gpd. In order to minimize the occurrence of accidental release of raw wastewater, the proposed lift station will be equipped with pump failure and high-water alarms, and an auto-dialer that will alert operations staff to emergency situations. In addition to the auto-dialer, an audible alarm siren and visual alarm light will activate to alert and draw attention in the surrounding area. AMHP has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms. In addition to the alarms, an overflow manhole will be installed next to the lift station and if necessary, the wastewater will automatically fill the overflow manhole if the pumps are not operating correctly. The overflow manhole will hold 2 hours of peak hour flow or 8 hours of average day flow, which gives the operator time to address and fix any issues with the lift station before a spill would occur.

2.303 (21b): *Location of storage areas designated for equipment, fuel, lubricants, and chemical and waste storage with an explanation of spill containment plans and structures.*

Required equipment is stored at the AMHP office, which is on site. This allows for easy access to any necessary equipment in case of a mechanical failure at the lift station. There are no chemicals that are needed to operate the project, so no chemicals need to be stored.

SECTION 2.303 (22) MONITORING AND MITIGATION PLAN

2.303 (22a): *Description of all mitigation that is proposed to avoid, minimize or compensate for adverse impacts of the Project and to maximize positive impacts of the Project.*

(i) Describe how and when mitigation will be implemented and financed.

The design of the lift station takes steps to minimize potential wastewater spills. The lift station will be equipped with an automatic transfer switch (ATS) that will automatically activate the backup generator if the lift station experiences a power failure and AMHP has access to portable pumps that can be used in the event of a mechanical failure. Emergency storage for 2 hours of peak hour flow or 8 hours of average day flow is also provided. Access to the lift station site will be limited to approved staff members of AMHP and CMD to limit adverse impacts to the public.

(ii) Describe impacts that are unavoidable that cannot be mitigated.

There are no known unavoidable impacts.

2.303 (22b): *Description of methodology used to measure impacts of the Project and effectiveness of proposed mitigation measures.*

Any spill at the lift station will be reported to CDPHE. Refer to the Site Application located in Exhibit I for more information.

2.303 (22c): *Description, location and intervals of proposed monitoring to ensure that mitigation will be effective.*

The lift station will be equipped with pump failure and high-water alarms, and an auto-dialer that will alert operations staff to emergency situations. In addition to the auto-dialer, an audible alarm siren and visual alarm light will activate to alert and draw attention in the surrounding area. AMHP has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms.

SECTION 2.303 (23) ADDITIONAL INFORMATION

2.303 (23): *The Director may request that the applicant supply additional information related to the Project if the Director and/or the Permit Authority will not be able to make a determination on any one of the applicable Review Criteria without the additional information. Such additional information may include applicant's written responses to comments by a referral agency*.

This is noted and will be addressed as requested by the Director.

RESPONSE TO CHAPTER 4, ARTICLE 2, OF THE COUNTY GUIDELINES

The following sections are in response to Chapter 4, Article 2, Paragraph 4.201 of the County Guidelines as the Project relates to Domestic Sewage Treatment within unincorporated El Paso County as outlined in Paragraph 4.201 of the guidelines.

SECTION 4.201 (1) AGENCY REVIEW

4.201 (1): *Preliminary review and comment on the proposal by the appropriate agency of the Colorado Department of Natural Resources and the Colorado Department of Public Health and Environment within sixty (60) days of the date of submittal of the proposal for review.*

The site application (30% plans) for the lift station was submitted to CDPHE for review in June 2018. The preliminary review and comments from CDPHE about the site application are attached in Exhibit Q. One item in the review is the need for all agencies to sign off on the site application. PPACG and the El Paso County Department of Health and Environment have signed off on the site application as seen in Exhibit R. We are waiting on approval of this 1041 permit to obtain approval of the site application from El Paso County to respond to the CDPHE comments. As soon as the site application is approved by CDPHE, CDPHE will begin reviewing the Basis of Design report (100% plans) for final approval.

SECTION 4.201 (2) SCOPE OF PROPOSAL

4.201 (2a): *Provide detailed plans of the proposal, including proposed system capacity and service area plans mapped at a scale acceptable to the Department.*

Detailed plans and information about the system capacity and service area can be found in the Site Application in Exhibit I.

4.201 (2b): *Provide a description of all existing or approved proposed domestic water or sewage treatment systems within the Project area.*

The closest domestic sewage system is Cherokee Metropolitan District's Water Reclamation Facility, which is approximately 7 miles south east of the AMHP. This is the sewage treatment facility that AMHP will consolidate with. There is an existing WWTP the AMHP has owned and operated for many years located on the AMHP site; however, the treatment plant was never permitted and is currently discharging to groundwater without a permit. Part of this project will decommission the WWTP so unpermitted discharge to groundwater does not continue on the site.

4.201 (2c): *Describe the design capacity of each domestic water or sewage treatment system facility proposed and the distribution or collection network proposed in the Project area.*

The lift station is designed to convey the wastewater flows from AMHP to a gravity sewer line that runs along North Curtis Road approximately 820 ft east of the location of the lift station. The lift station is designed to convey an average day flow of 7,500 gpd and a peak hour flow of 30,000 gpd. The design is discussed in detail in the Site Application in Exhibit I.

4.201 (2d): *Describe the excess capacity of each treatment system and distribution or collection network in the affected community or Project area.*

The AMHP is at full buildout; therefore, the lift station was not designed for excess flow. A complete discussion of the design can be found in the Site Application in Exhibit I.

4.201 (2e): *Provide an inventory of total commitments already made for current water or sewage services.*

The AMHP has a commitment from Cherokee Metropolitan District to accept the flows from AMHP and to allow AHMP to be considered in district. The resolution that verifies this can be seen in Exhibit H.

4.201 (2f): *Describe the operational efficiency of each existing system in the Project area, including the age, state of repair and level of treatment.*

The existing wastewater treatment plant that is located on the AMHP site will be decommissioned as part of this project. The collection system is in good condition and AMHP staff has had no major issues with or breaks in the pipes.

4.201 (2g): *Describe the existing water utilization, including the historic yield from rights and use by category such as agricultural, municipal and industrial supply obligations to other systems.*

The AMHP water system is currently made up of 3 wells. The AMHP typically operates 2 of the wells and pumps them through a chlorination system and into storage cisterns. The cisterns then connect to pressure tanks that supply water to the distribution system. The third well has a separate pressure system and pumps directly into the distribution system. The third well only operates if the primary system with the other two wells fails. The main two wells pump at 12 and 15 gpm and the well for the backup system pumps at 7.7 gpm. Based on an assumed average of 120 gpcd and 135 people, the required flow rate is 16,200 gpd or 11.25 gpm. The wells supply sufficient water for AMHP since there is a total of 34.7 gpm available from the wells and only 11.25 gpm is required. AMHP residents do not irrigate and there is no agricultural or industrial demand. The only water usage is municipal.

SECTION 4.201 (3) DEMONSTRATION OF NEED

4.201 (3a): *Provide population trends for the Project area, including present population, population growth and growth rates, documenting the sources used.*

AMHP consists of 54 mobile homes and has an estimated population of 135 based on an estimated 2.5 people per mobile home. Because AMHP is at full build out and no future growth can occur, the current population is the same as the future population.

4.201 (3b): *Specify the predominant types of developments to be served by the proposed new water and/or sewage systems or extensions thereof.*

The service area that will be served by the lift station is a mobile home park that is made up of 54 units. There are no proposed future developments that will be served by the lift station.

4.201 (3c): *Specify at what percentage of the design capacity the current system is now operating:*

(i) Water treatment system.

Not Applicable

(ii) Wastewater treatment system.

The CMD WRF currently operates at approximately 42% of the design capacity.

4.201 (3d): *Specify whether present facilities can be upgraded to accommodate adequately the ten-year projected increase needed in treatment and/or hydraulic capacity.*

Because the AMHP is a full build out and there is no anticipated growth in the service area, the facilities will not need to accommodate increased treatment or hydraulic capacity needs. The CMD WRF has sufficient

capacity to accommodate the flows from AMHP with the AMHP flows increasing the flow at the CMD RWF by approximately 0.2%.

SECTION 4.201 (4) WATER USAGE

4.201 (4): *Description of the water to be used by the Project and, to the extent identified by the Director in consultation with the applicant, alternatives, including: the source, amount, the quality of such water; the applicant's right to use the water, including adjudicated decrees or determinations and any substitute water supply plans, and applications for decrees or determinations; proposed points of diversion and changes in the points of diversion; the existing uses of the water; adequate proof that adequate water resources have been or can and will be committed to and retained for the Project, and that applicant can and will supply the Project with water of adequate quality, quantity, and dependability; and approval by the respective Designated Ground Water Management District if applicable. If an augmentation or replacement plan for the Project has been decreed or determined or an application for such plan has been filed in the court or with the Ground Water Commission, the applicant must submit a copy of that plan or application.*

The CMD WRF is currently under a Compliance Order on Consent due to high TDS concentrations. Because of this, CDPHE is requiring AMHP to backwash the wastewater seen at the lift station with clean water to decrease the TDS concentration to below the effluent concentration CMD WRF must maintain. This means that AMHP will backwash with approximately 5,000 gpd of water from the wells to dilute the 7,500 gpd of wastewater so the TDS concentration is below the effluent TDS concentration allowed by CMD WRF discharge permit. There is a current backwash system in place that will be used to accomplish this. The current system backwashes 1,000 gallons per cycle, so 5 backwash cycles per day will be necessary. The AMHP will be able to supply the water required for this. The well permits for the Arrowhead Mobile Home Park do not require augmentation for the water that is pumped from the wells.

SECTION 4.201 (5) LOSS OF AGRICULTURAL PRODUCTIVITY

4.201 (5a): *Information on any agricultural water rights in the region converted to provide water for the Project, now or in the future.*

No agricultural water rights will be converted to provide water for the project now or in the future.

4.201 (5b): *Information on the amount of irrigated agricultural lands taken out of production, and a description of revegetation plans.*

No irrigated agricultural lands will be taken out of production as a result of this project.

4.201 (5c): *Economic consequences of any loss of irrigated agriculture, including loss of tax base, in the region.*

No loss in irrigated agriculture will result from this project; therefore, no economic consequences from that lose will result.

4.201 (5d): *Information as to loss of wildlife habitat, loss of topsoil, or noxious weed invasion, as a result of the transfer of water rights and subsequent dry-up of lands.*

No transfer of water rights will result from this project.

4.201 (5e): *Information on impacts to agricultural head gates and water delivery systems.*

There are no anticipated impacts to agricultural head gates and water delivery systems.

SECTION 4.201 (6) FINANCIAL IMPACT

The financial impact analysis of site selection and construction of major new water and sewage treatment facilities and/or major extension of existing domestic water and sewage treatment systems shall include but need not be limited to the following items:

4.201 (6a): *A review and summary of any existing engineering and/or financial feasibility studies, assessed taxable property valuations and all other matters of financial aid and resources in determining the feasibility of the proposed new facility, including:*

(i) Service area and/or boundaries.

The service area can be seen in the Site Application in Exhibit I. The project will be privately funded. The residents of the mobile home park within the service area will pay for the project in the long term with increased lot rents.

(ii) Applicable methods of transmitting, storing, treating and delivering water and collecting, transmitting, treating and discharging sewage, including effluent and/or sludge disposal.

The lift station will convey wastewater to connect with the CMD WRF collection system.

(iii) Estimated construction costs and period of construction of each new or extension facility component.

The estimated construction cost is $121,592. It is anticipated that construction will start in the winter of 2018/2019. Construction is expected to take approximately one month.

(iv) Assessed valuation of the property to be included within the service area boundaries.

The assessed value of the property is $33,650 according to the El Paso County Assessor's office.

(v) Revenues and operating expenses of the proposed new or extension facility, including but not limited to historical and estimated property taxation, service charges and rates, assessments, connection and tap fees, standby charges and all other anticipated revenues of the proposed new facility.

The AMPH does not have a separate revenue and expense account for the wastewater system. The owner includes the wastewater service in the lot rent that is charged for each lot.

(vi) Amount and security of the proposed debt and method and estimated cost of debt service.

The project will be privately funded and the owner will increase lot rents to cover the cost of the project.

(vii) Provide the details of any substantial contract or agreement for revenues or for services to be paid, furnished or used by or with any person, association, corporation or governmental body.

The lot rents cover the costs associated with operating and maintaining the AMHP including the water and wastewater systems. The owner maintains contracts with the residents to ensure payment for the lot rents. With consolidation with CMD, the AMHP will have to pay a tap fee to tie in. AMHP is working with CMD to determine what the tap fee will be. AMHP will also have to pay CMD monthly for the amount of wastewater that is pumped into CMD's collection system from the lift station. All of these fees will be accounted for with the increase in lot rents to cover the cost of the project.

EXHIBIT B – 1041 APPLICATION FORM

Exhibit B

APPLICATION FOR A PERMIT TO CONDUCT A
DESIGNATED ACTIVITY OF STATE INTEREST OR TO
ENGAGE IN DEVELOPMENT IN A DESIGNATED AREA
OF STATE INTEREST

To: Permit Authority, El Paso County

Re: Arrowhead Mobile Home Park - Lift Station
as a matter of state interest.

From: Dayton Orsburn, Arrowhead Mobile Home Park Owner
P.O. Box 154
Chino Hills, CA 91709
(909) 576-1324

Date Submitted: October 4, 2018

Date Received and Accepted as Complete:

1. Matter of State Interest.

The applicant requests that a permit be issued for each of the items checked below: A

permit to conduct one or more of the following matters of state interest:

~~a. Efficient utilization of municipal and industrial water projects~~

b. Site selection and construction of major new domestic water and sewage treatment systems and/or major extension of existing domestic water and sewage treatment systems

~~c. Site selection and construction of major facilities of a public utility~~

~~d. Development in areas containing or having a significant impact upon floodplain natural hazard areas~~

~~e. Site selection and expansion of airports~~

~~f. Site selection of arterial highways and interchanges and collector highways~~

~~g. Site selection of rapid or mass transit facilities~~

2. Proposed Activity or Development.

General description of the specific activity or development proposed:

The project includes the construction of a packaged lift station on park property and approximately 850 feet of force main in order to connect to the Cherokee Metropolitan District collection system. No changes to population, flows, or wastewater characteristics are expected as the mobile home park is at full buildout. Operation of the lift station and maintenance of all piping and equipment on mobile home park property will be the responsibility of the Owner. The project also includes the complete decommissioning of the existing unlined lagoons at AMHP. See the Site Application Report in Exhibit I for additional project details.

3. Location of Development:

A general, nonlegal description and the popular name, if any, of the tract of land upon which the activity or development is to be conducted:

Arrowhead Mobile Home Park (AMHP) is located approximately 10 miles east of Colorado Springs along State Highway 94, in Section 15, Township 14 South, Range 64 West of the 6th Prime Meridian.

4. Legal Description.

The legal description, including the acreage, of the tract of land upon which the development or the activity is to be conducted, by metes and bounds or by government survey description: (attach additional sheets if necessary):

See Exhibit S.

5. Owners and Interests.

Set out below the names of those persons holding recorded legal, equitable, contractual and option interests and any other person known to the applicant having any interest in the property described in paragraph 4, above, as well as the nature and extent of those interests for each person, provided that such recorded interests shall be limited to those which are recorded in the El Paso County Clerk and Recorder's Office, the land office of the Bureau of Land Management for this State, the Office of the State Board of Land Commissioners of the Department of Natural Resources, or the Secretary of State's Office of this State (attach additional sheets if necessary):

Dayton and Leah Orsburn, Co-Trustees

6. Submission Requirements.

Submission requirements described in the Guidelines and Regulations for Areas and Activities of State Interest of El Paso County for each of the activities or areas checked in paragraph 1 above, are attached to this application. Those attachments are identified, by letter or number, and

described by title below:

2.303 – Submission Requirements for all Permit Applications; Waivers
4.201 – Application Submission for Site Selection and Construction of Major New Domestic Water and Sewage Systems and Major Extensions of Existing Water and Sewage Treatment Systems

Please see the Table of Contents for the location of responses and supporting exhibits.

7. Additional Information Required:

Attach any additional information required by the Guidelines and Regulations, and as may be required by the Development Services Department Director.

N/A

8. Duration of Permit.

The Applicant requests a permit for a period of one (1) years.

9. Application Fee.

The required application fee is submitted herewith.

APPLICANT:

By:_____

Dayton Orsburn
Park Owner

EXHIBIT C – MINERAL RIGHTS

CERTIFICATION:

☒ I Nicholas P. Marriotte researched the records of the El Paso County Clerk and Recorder and established that there ☐ was/☒ was not a mineral estate owner(s) on the real property known as Arrowhead Mobile Home Park.
S2 SW4 NW4 Ex that PT Conv to County by Rec# 203038692.

☐ An initial public hearing on _____ (subject of the hearing), is scheduled for _____, 20____.

☐ Subject to §24-65.5-103(4), C.RS., I certify that a Notice of an initial public hearing was mailed to the mineral estate owner(s) (if established above) and a copy was mailed to the El Paso County Planning Department on _____20____.

Dated this 18th day of September, 2018.

STATE OF COLORADO)
) s.s.
COUNTY OF EL PASO)

The foregoing certification was acknowledged before me this 18 day September of 2018.

Witness my hand and official seal: Deborah Webb.

My Commission Expires: 10-10-2021.

Seal

DEBORAH WEBB
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20174042061
MY COMMISSION EXPIRES 10/10/2021

EXHIBIT D – REPORT WRITERS RESUMES

Nicholaus P. Marcotte, PE

President & Project Manager

Education

BS, Civil Engineering
University of Kansas
Lawrence, Kansas

Professional Certification

State of Colorado Professional Engineer
License No. 47164

State of Kansas Professional Engineer
License No. 23806

State of Wyoming Professional Engineer
License No. 16199

Experience

Nick has over 10 years of experience in civil engineering including project management, client management, wastewater treatment and collection design, water treatment and distribution design, master planning, contract documents, construction observation, and grant funding assistance .

Project Experience

Wastewater Treatment Plant Improvements | Project Manager
Center Sanitation District | Center, CO
Managed design of 0.60 MGD activated sludge wastewater treatment plant to replace lagoon system. Acted as project and client manager including oversite of design, budget, and funding. Plant was designed to meet stringent effluent groundwater limits including total inorganic nitrogen limit of 10 mg/L and total coliform limit of 2.2 per 100 mL. Design included: influent lift station, headworks, hybrid continuous flow/sequencing batch reactor activated sludge system, tertiary filter, UV disinfection, and sludge handling. Obtained and managed funding for project design and construction through CDPHE, DOLA, and USDA.

Water System Improvements | Project Manager
Lake Forest Mutual Water Company | Grand Lake, CO
Acted as project and client manager for water system improvements project including 12,500 linear feet of water distribution pipe, pressure reducing valves, 45,000 gallon potable water storage tank, and distribution pumping system. Coordinated between company representatives and design team to determine appropriate pipe alignment based on narrow utility corridors and mountainous terrain. Compiled EJCDC contract documents in accordance with USDA requirements. Managed funding for project design and construction through USDA.

Wastewater Treatment Plant Improvements | Project Manager
Town of Hugo | Hugo, CO
Managed design of 0.085 MGD evaporative pond system and associated lift station to replace un-aerated, un-lined lagoon system not capable of meeting CDPHE effluent limits. Coordinated with CDPHE and client to manage design, permitting, funding, and floodplain details. Obtained and managed design and construction funding through CDPHE and DOLA.

Wastewater Treatment Plant Improvements | Project Manager
Town of Alma | Alma, CO
Managed design of 0.117 MGD wastewater treatment plant rehabilitation to meet effluent ammonia limits of 20 mg/L. Acted as client and project manager including design and budget oversite, CDPHE coordination, and funding coordination. Existing facility consisted of three pond lagoon system situated at over 10,000 ft elevation that experiences harsh winter conditions including wastewater approaching 0°C. Improvements included new diffusers, pond covers, and construction of a small MBR outfitted with a heat exchanger run off of solar panels for ammonia reduction. Obtained and managed design and construction funding through CDPHE and DOLA.

Nicholaus P. Marcotte, PE

President & Project Manager

Project Experience

Wastewater Treatment Plant Improvements—Activated Sludge | Project Manager & Project Engineer
Managed and designed activated sludge wastewater treatment plants including flow monitoring, lift station, headworks, secondary treatment, tertiary filter, UV disinfection, and chlorine disinfection. Designed to meet stringent effluent ammonia, total inorganic nitrogen, and total coliform limits. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:
Center Sanitation District | *Edgemont Ranch Metropolitan District* | *North La Junta Sanitation District* | *Town of Red Cliff*

Wastewater Treatment Plant Improvements—Lagoons | Project Manager & Project Engineer
Managed and designed lagoon wastewater treatment plant improvements including flow monitoring, lift station, headworks, complete mix and partial mix lagoons, cold weather nitrification technologies, chlorine disinfection, hydraulic re-rating, and discharge point relocation. Designed to meet effluent BOD, TSS, ammonia, and Regulation 84 re-use limits. Compiled and managed the compilation of alternative technology reports, design reports, construction drawings, and contract documents. Projects include:
Kremmling Sanitation District | *Town of Alma* | *Fairways Metropolitan District* | *Town of Del Norte*

Evaporative Wastewater Treatment | Project Manager & Project Engineer
Managed and designed non-discharging evaporative wastewater treatment ponds as low maintenance alternatives to discharging lagoons or activated sludge plants. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:
Town of Hugo | *Town of Eckley* | *Town of Wiley*

Water System Improvements | Project Manager & Project Engineer
Managed and designed water treatment, storage, and distribution system pumping equipment including: groundwater and surface water treatment; buried, at-grade, and elevated water storage tanks and clearwells; and pumping systems designed to meet 10 - 2,000 gpm. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:
Town of Del Norte | *Town of Buena Vista* | *Town of Hugo* | *Lone Star School*| *Lake Forest Mutual Water Company*

Water Distribution, Sanitary Sewer Collection, and Irrigation Systems | Project Manager & Project Engineer
Managed and designed thousands of linear feet of water distribution pipe, pressure reducing valves, sanitary gravity collection pipe, wastewater lift stations, wastewater force main, and sanitary sewer manholes. Compiled and managed the compilation of design reports, construction drawings, and contract documents. Projects include:
Lake Forest Mutual Water Company | *Town of Del Norte* | *Town of Buena Vista* | *City of Monte Vista* | *East Alamosa Water and Sanitation District* | *Buckhorn Valley Metropolitan District* | *Crestview Water and Sanitation District*

Utility Master Planning | Project Manager & Project Engineer
Managed and compiled master plans documenting existing utility infrastructure and recommended improvements including cost estimates and user rate analyses to support improvements. Projects include:
Deer Creek Water District | *City of Monte Vista* | *Last Dollar PUD* | *Town of Del Norte* | *Town of Eckley*

Courtney D. Husted, EIT

Project Engineer

Education

BS, Chem. Engineering
Colorado School of Mines
Golden, Colorado

MS, Enviro. Engineering
Colorado School of Mines
Golden, Colorado

Professional Certification

Engineer in Training

Experience

Courtney has over 4 years of experience in civil engineering including wastewater treatment and collection design, water treatment and distribution design, contract documents, and grant funding assistance and coordination.

Project Experience

Wastewater Treatment Plant Improvements | Project Engineer
Town of Eckley | Eckley, CO
Designed 0.047 MGD evaporative pond system with two associated lift stations. Performed engineering calculations, drafted design reports, and compiled construction plans. Completed cost estimates and assisted in obtaining and managing grant and loan funding for design and construction of project through CDPHE Small Communities Grant and USDA.

Water System Improvements | Project Engineer
Town of Buena Vista | Buena Vista, CO
Performed engineering calculations to design a redundant 750,000 gallon water storage tank. Performed engineering calculations to add chlorine disinfection to an existing irrigation well to add a redundant drinking water source. Compiled the basis of design reports for the storage tank and drinking water well. Assisted with funding coordination through CDPHE.

Collection System Improvements Project| Project Engineer
Town of Del Norte | Del Norte, CO
Designed 80,000 linear feet of sanitary sewer gravity pipe rehabilitation including slope and alignment modifications due to significant utility crossings. Performed engineering calculations to design a 720 gpm lift station and force main to pump wastewater from the town's collection system to the wastewater treatment plant. Drafted EJCDC contract documents per USDA requirements. Assisted with grant and loan coordination through DOLA and USDA.

Wastewater Treatment Plant Improvements | Project Engineer
Galeton Water and Sanitation District | Galeton, CO
Designed 0.0185 MGD activated sludge wastewater treatment plant to meet effluent total inorganic nitrogen limit of 10 mg/L. This plant replaced an existing lagoon system that was under a Notice of Violation/Cease and Desist Order due to effluent violations. Design included: headworks, secondary treatment activated sludge system, and chlorine and dechlorination system. Assisted with and managed funding for project design and construction through USDA.

Water Treatment Pilot Plants | Project Engineer
Denver Water | Denver, CO
Operated a pilot plant to determine the filter loading rate for Anthracite and GAC filter media to obtain higher filter loading rate approval through CDPHE. Operated a pilot plant to determine the optimum corrosion control treatment technology for reduced lead levels.

EXHIBIT E – VICINITY MAP

VICINITY MAP

DATE
SEPTEMBER 2018

JOB NUMBER
0013.0001

SCALE
1" = 5,000'

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

EXHIBIT F – LIFT STATION PLANS

CONSTRUCTION PLANS

ARROWHEAD MOBILE HOME PARK
LIFT STATION

SECTION 15, TOWNSHIP 14 SOUTH, RANGE 64 WEST OF THE SIXTH P.M.

PREPARED FOR:

ARROWHEAD MOBILE HOME PARK
DAYTON AND LEAH ORSBURN, CO-TRUSTEES
909.576.1324
P.O. BOX 154
CHINO HILLS, CA 91709

EMERGENCY CONTACT: RHONDA FOLDEN, PARK MANAGER
719.683.2727

ENGINEERING

ELEMENT ENGINEERING, LLC
NICHOLAUS P. MARCOTTE, P.E. #47164
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165

VICINITY MAP
NOT TO SCALE

N

AREA MAP
NOT TO SCALE

SHEET INDEX:

CIVIL

C1	COVER SHEET
C2	GENERAL NOTES
C3	EXISTING CONDITIONS
C4	SITE PLAN
C5	LIFT STATION DETAILS
C6	DETAILS

CHEROKEE METROPOLITAN DISTRICT
WASTEWATER PLAN DESIGN APPROVAL

APPROVED BY: _____ DATE: _____

Approval expires one (1) year from the date above and resubmittal of these plans for review and approval is required if construction does not begin during this period.

NOTE:
THESE PLANS ARE CONCEPT IN NATURE AND PREPARED IN SUPPORT OF A BASIS OF DESIGN REPORT SUBMITTAL.

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	100% PLANS	05/18	NPM

LIFT STATION - CONSOLIDATION

COVER SHEET

ARROWHEAD MOBILE HOME PARK
6175 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
NTS

DRAWING NAME
COVER

SHEET
C1 OF C7

GENERAL NOTES (ALL CONSTRUCTION):

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS AS APPLICABLE WITH EL PASO COUNTY, COLORADO STANDARDS AND SPECIFICATIONS AS APPLICABLE. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS, SPECIFICATIONS, AND THE MOST CURRENT COPY OF THE SPECIFICATIONS AND REGULATIONS AS APPROVED BY THE APPROPRIATE GOVERNING AGENCY. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE MENTIONED DOCUMENTS.

2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PARK OF ANY PROBLEM IN CONFORMING TO THE APPROVED PLANS FOR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO ITS CONSTRUCTION.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE APPROPRIATE GOVERNING AGENCIES AT LEAST 48 HOURS PRIOR TO START OF ANY CONSTRUCTION. IF WORK IS SUSPENDED FOR ANY PERIOD OF TIME AFTER INITIAL START-UP, THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE GOVERNMENT AGENCIES 48 HOURS PRIOR TO RESTART.

4. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF PUBLIC UTILITIES SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF THESE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL PROTECT, AT HIS OWN EXPENSE, ALL EXISTING UTILITIES AND BE RESPONSIBLE FOR THEIR REPAIR IF THEY ARE DAMAGED DURING CONSTRUCTION.

   ALL KNOWN EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ON THE PLANS. THE ACTUAL LOCATION MAY VARY FROM THE PLANS, ESPECIALLY IN THE CASE OF UNDERGROUND UTILITIES. WHENEVER THE CONTRACTOR DISCOVERS A DISCREPANCY IN LOCATIONS, HE SHALL CONTACT THE PARK AND THE GOVERNING AUTHORITY IMMEDIATELY.

5. PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL OBTAIN ANY WRITTEN AGREEMENTS FOR INGRESS AND EGRESS TO THE WORK FROM ADJACENT PRIVATE PROPERTY WHICH SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

6. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING, BUT NOT LIMITED TO, ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

7. ALL EXCAVATIONS SHALL MEET CURRENT OSHA GUIDELINES.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ALL MATERIALS DISTURBED WITHIN DEDICATED RIGHTS-OF-WAYS AND ALL MATERIALS AND WORKMANSHIP SHALL MEET THE CONSTRUCTION STANDARDS OF THE PARK, AS APPLICABLE.

9. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE PROPER FUNCTIONING OF THE IMPROVEMENTS FOR A MINIMUM OF TWO (2) YEARS FROM THE DATE OF INITIAL ACCEPTANCE OF THE IMPROVEMENTS BY ARROWHEAD MOBILE HOME PARK. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIED BY THE CONTRACTOR TO THE SATISFACTION OF THE PARK AND AT NO EXPENSE TO ANY OF THE AGENCIES.

10. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY ARROWHEAD MOBILE HOME PARK. THE PARK RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.

11. THE CONTRACTOR SHALL NOTIFY THE PARK OWNERS A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO STARTING CONSTRUCTION.

12. ACCESS MUST BE MAINTAINED FOR ALL EMERGENCY VEHICLES, BUSINESSES, CITIZENS AND DELIVERIES AT ALL TIMES DURING CONSTRUCTION.

13. NO PAVING OR CONCRETE WORK OF ANY KIND SHALL START UNTIL ALL SUBGRADE COMPACTION TESTS ARE TAKEN AND ACCEPTED AND A PROOFROLL IS PERFORMED AND ALL AREAS PASS BY THE PARK.

14. ALL SUBGRADE MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY PER ASTM D-698 AT A MOISTURE CONTENT PER THE RECOMMENDATION OF THE TESTING AGENCY.

15. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL DISTURBED SURFACES AND RELATED STRUCTURES, INCLUDING, BUT NOT LIMITED TO, DRIVEWAYS, CURBS, GUTTERS, WALKS, GRASS AREAS AND BITUMINOUS PAVEMENTS TO ORIGINAL CONDITIONS (OR BETTER). THE PARK AND THE CONTRACTOR SHALL COORDINATE THE DOCUMENTATION OF EXISTING GRADES, CONDITIONS, AND OTHER INFORMATION PRIOR TO ALL CONSTRUCTION ACTIVITIES. SITE RESTORATION SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND WILL NOT BE PAID FOR SEPARATELY, UNLESS OTHERWISE PROVIDED FOR IN THE BID SCHEDULE.

17. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY FIELD CONDITION NOT CONSISTENT WITH THE DRAWINGS OR CONTRACT DOCUMENTS.

18. THE CONTRACTOR IS RESPONSIBLE FOR SAVING AND PROTECTING ALL EXISTING TREES AND VEGETATION WHERE REMOVAL FOR CONSTRUCTION IS NOT MANDATORY. ALL TREES TO BE REMOVED OR RELOCATED WILL BE MARKED BY THE PARK PRIOR TO REMOVAL.

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL FLOWS INCLUDING STORM FLOWS IN AND ENTERING THE WORK AREA, OFF-SITE DRAINAGE FLOWS, AND GROUNDWATER FLOWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO STRUCTURES, LOSS OF TOPSOIL, AND LOSS OF SEED CAUSED BY FLOWS UNTIL THE PROJECT IS ACCEPTED BY THE PARK. ALL WORK SHALL BE COMPLETED IN DRY CONDITIONS.

20. THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAN UP ANY TRASH OR MUD ON THE SITE OR ADJACENT STREETS AS A RESULT OF CONSTRUCTION. ALSO, THE CONTROL OF DUST DUE TO CONSTRUCTION ACTIVITIES IS MANDATORY.

21. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE PARK. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO THE PARK FOR REVIEW PRIOR TO CONSTRUCTION AND SHALL OBTAIN ANY NECESSARY PERMITS AND APPROVALS FROM THE PARK AS REQUIRED PRIOR TO CONSTRUCTION.

SANITARY SEWER NOTES:

1. ALL DIRECT BURY SEWER MAINS SHALL BE PVC.

2. SEWER LINES SHALL BE 10 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. FOR SEWER LINES WHICH CROSS LESS THAN 1 ½ FEET VERTICALLY FROM WATER LINES, THE CLOSEST SANITARY SEWER JOINT SHALL BE A MINIMUM OF 6 FEET FROM THE CROSSING.

3. ALL MANHOLES SHALL BE WATER TIGHT PRECAST CONCRETE, A MINIMUM OF 48 INCH IN DIAMETER WITH ECCENTRIC CONE, 24 INCH CAST IRON RING (8" DEPTH) AND COVER, UNLESS OTHERWISE SPECIFIED. CONCRETE ADJUSTMENT RINGS SHALL BE USED FOR ADJUSTMENT TO MATCH FINAL PAVEMENT ELEVATIONS AND SET IN MASTIC TO OBTAIN A WATER TIGHT SEAL. CONCRETE ADJUSTMENT RINGS SHALL BE 4" MINIMUM IN DEPTH TO ELIMINATE MULTIPLE JOINTS.

4. SEWER RIM ELEVATIONS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS.

5. THE CONTRACTOR TO VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL TIE IN POINTS PRIOR TO CONSTRUCTION AND PROVIDE THE DATA TO THE ENGINEER PRIOR TO CONSTRUCTION.

6. PIPE BEDDING SHALL BE CLASS "B" AND SHALL CONFORM TO ASTM C-33 OR D-448 GRADATION NO. 6 OR NO. 67. SQUEEGEE BEDDING IS PREFERRED. BEDDING DEPTH SHALL BE 6" UNDER AND AROUND THE SIDES OF THE PIPE AND 12" OVER THE PIPE. CONSOLIDATION IN PIPE ZONE SHALL BE BY HAND TAMPING.

7. AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE PARK'S OFFICE AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PARK ENGINEER TO SCHEDULE THIS MEETING.

8. THE CONTRACTOR WILL IDENTIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION.

9. THE CONTRACTOR SHALL HAVE IN THEIR POSSESSION AT ALL TIMES ONE SIGNED COPY OF PLANS APPROVED BY THE PARK AND THE PARK'S ENGINEER. THESE PLANS WILL ALSO INCLUDE ALL ADDENDUMS OR REVISIONS WHICH HAVE BEEN REVIEWED AND APPROVED BY THE PARK AND THE PARK ENGINEER.

10. ALL MANHOLES SHALL HAVE SHAPED INVERTS.

11. ALL FORCE MAINS SHALL BE TESTED PRIOR TO INITIAL ACCEPTANCE OR ANY CONNECTION.

12. ALUMINUM FOIL WARNING TAPE SHALL BE USED FOR ALL NEW DIRECT BURY SEWER MAINS. THE TAPE WILL BE INSTALLED 2' BELOW FINISHED GRADE. TAPE MUST BE GREEN IN COLOR.

13. ALL BARREL SECTIONS OF MANHOLES SHALL BE GROUTED INSIDE AT JOINTS.

14. IF SEWAGE BYPASS PUMPING IS NECESSARY, THE CONTRACTOR WILL SUPPLY AND MONITOR THE PUMP DURING THE ENTIRE PUMPING PERIOD. A BACK-UP PUMP WILL BE ONSITE FOR USE IF NECESSARY. BYPASS HOSE SHALL BE PROTECTED FROM TRAFFIC DAMAGE USING APPROVED APPARATUS. FOR ALL SEWAGE BYPASS PUMPING. THE CONTRACTOR WILL HAVE CONTINUOUS ON SITE MONITORING OF PUMPING OPERATIONS.

15. SHOULD TRENCH DEWATERING BECOME NECESSARY, THE CONTRACTOR WILL OBTAIN ALL REQUIRED PERMITS AND SUPPLY THE PUMPS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

16. ALL MANHOLE AND SANITARY SEWER MAIN TESTING SHALL BE WITNESSED BY A REPRESENTATIVE OF THE PARK. A MINIMUM OF 24 HOURS ADVANCED NOTICE IS REQUIRED PRIOR TO TESTING.

17. ALL MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12-INCH WIDE CONSEAL CS 212 OR APPROVED EQUIVALENT.

TESTING AND INSPECTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL REQUIRED OR NECESSARY INSPECTIONS ARE COMPLETED BY AUTHORIZED INSPECTORS PRIOR TO PROCEEDING WITH THE SUBSEQUENT WORK WHICH COVERS OR THAT IS DEPENDENT ON THE WORK TO BE INSPECTED. FAILURE TO OBTAIN NECESSARY INSPECTION(S) AND APPROVAL(S) SHALL RESULT IN THE CONTRACTOR BEING FULLY RESPONSIBLE FOR ANY ISSUES ARISING FROM UN-INSPECTED WORK.

2. CONTRACTOR TO SIMULATE PERMITTED HYDRAULIC FLOW FOR MINIMUM OF SIX (6) HOURS AND MINIMUM FLOW FOR (6) HOURS TO FILTER LIFT STATION AND FILTER DURING TESTING.

ABBREVIATIONS

ARVB	AIR RELIEF VACUMBREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
℄	CENTERLINE	NW	NORTHWEST
CMP	CORRUGATED METAL PIPE	OH	OVERHEAD
DIA. OR ø	DIAMETER	PVC	POLYVINYL CHLORIDE
E	EAST	RAD OR R	RADIUS
EA	EACH	RPP	REINFORCED POLYPROPYLENE
ELEC	ELECTRICAL LINE	S	SOUTH
EOA	EDGE OF ASPHALT	SE	SOUTHEAST
EXIST. OR EX.	EXISTING	SW	SOUTHWEST
INV	INVERT	T.O.P.	TOP OF PIPE
L.P.	LOW POINT	UON	UNLESS OTHERWISE NOTED
FM	FORCE MAIN		

CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY

ELEMENT ENGINEERING LLC
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REVISIONS

NO.	DESCRIPTION	DATE	BY
1	100% PLANS	05/18	NPM

LIFT STATION - CONSOLIDATION

GENERAL NOTES

ARROWHEAD MOBILE HOME PARK
375 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
NTS

DRAWING NAME
NOTES

SHEET
C2 OF C7

LEGEND

- FOUND SECTION CORNER AS NOTED
- FOUND PROPERTY CORNER AS NOTED
- SET CONTROL POINT AS NOTED
- UTILITY POLE
- GUY WIRE
- ELECTRIC TRANSFORMER
- TELEPHONE PEDESTAL
- CLEAN-OUT
- UNDERGROUND GAS SIGN
- (R) RECORD BEARING AND DISTANCE
- (M) MEASURED BEARING AND DISTANCE
- OHE — OVERHEAD UTILITY LINE
- UT — UNDERGROUND TETEPHONE LINE
- [-] [-] — BARB WIRE FENCE
- X X — WOOD FENCE
- CONCRETE SURFACE
- ASPHALT SURFACE

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LIFT STATION - CONSOLIDATION

EXISTING CONDITIONS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

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ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
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SCALE
AS SHOWN

DRAWING NAME
EXIST

SHEET
C3 OF C7

NOTES:

1. FORCE MAIN IS SLOPED AT A CONSTANT GRADE UP TO TIE-IN LOCATION TO AVOID LOCALIZED HIGH SPOTS.
2. CONTRACTOR TO CONFIRM LOCATIONS, ELEVATIONS, AND PIPE SIZES OF ALL TIE-IN LOCATIONS PRIOR TO CONSTRUCTION.
3. CONTRACTOR MAY SUBSTITUTE THE 2" SCH 80 PVC WITH 3" HDPE FOR FORCE MAIN AS LONG AS THE PRESSURE RATING IS THE SAME.
4. CONTRACTOR RESPONSIBLE FOR ALL PERMITS INCLUDING ROAD CUT. CONTRACTOR TO SUPPLY REQUIRED TRAFFIC CONTROL.
5. EXISTING UTILITIES TO BE PROTECTED. LOCATION SHOWN MAY NOT BE ACCURATE.
6. CONTROLS AND ELECTRICAL BY OTHERS.
7. FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS FOR INSTALL AND STARTUP.
8. CONTRACTOR TO VERIFY TIE IN PIPE PRESSURE AND REPORT TO ENGINEER PRIOR TO ORDERING PUMPS.

DETAIL 1: SCALE 1" = 5'

DETAIL 2: SCALE 1" = 10'

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LIFT STATION - CONSOLIDATION

SITE PLAN

ARROWHEAD MOBILE HOME PARK
7575 ARTHUR CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: JUNE 2018

JOB NUMBER: 0013.0001

SCALE: AS SHOWN

DRAWING NAME: SITE

SHEET C4 OF C7

C / C5 C5 WET WELL PROFILE VIEW
1" = 1'

A / C5 C5 WET WELL ACCESS PLAN VIEW
1" = 1'

B / C5 C5 WET WELL PLAN VIEW
1" = 1'

NOTES:
1. LIFT STATION SHALL BE EQUIPPED WITH AUTO DIALER TO ALARM STAFF OF LIFT STATION ALARM CONDITIONS. CONTRACTOR RESPONSIBLE FOR AUTO DIALER CONNECTION
2. LIFT STATION PANEL SHALL BE EQUIPPED WITH TRANSFER SWITCH TO CONNECT TO A PORTABLE GENERATOR
3. PEAK HOUR FLOW INTO LIFT STATION = 20.8 GPM
4. DESIGN PUMPING FLOW = 35 GPM
5. DESIGN POINT SHALL BE ACHIEVED USING VARIABLE FREQUENCY DRIVE (TDH = 54.8 FT) OR CREATION OF ARTIFICIAL HEAD BY PARTIALLY CLOSED VALVE (TDH = 76 FT)

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LIFT STATION - CONSOLIDATION

LIFT STATION DETAILS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: JUNE 2018
JOB NUMBER: 0013.0001
SCALE: 1" = 1'
DRAWING NAME: LS DETAIL
SHEET: C5 OF C7

MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"-36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"-48"

NOTE:
MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212.

SANITARY SEWER MANHOLE (CIP BASE)

Scale: *NONE*	Date: *SEPTEMBER 2015*
Revised:	Detail: *SS-4*

MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"-36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"-48"

NOTE: MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212. ALL INTERIOR JOINTS AND RISER RINGS MUST BE GROUTED.

SANITARY SEWER MANHOLE (PRECAST BASE)

Scale: *NONE*	Date: *SEPTEMBER 2015*
Revised:	Detail: *SS-5*

NOTE:MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEMEC SERIES 46-465 OR APPROVED EQUIVALENT IF GROUNDWATER IS ENCOUNTERED IN THE TRENCH.

TABLE IV

MIN. DEPTH OF BEDDING MAT'L. BELOW BOTTOM OF PIPE

PIPE SIZE-D*	d_1	d_2	d_3
18" & SMALLER	4"	6"	6"
21" TO 36"	6"	6"	6"
42" TO 60"	6"	6"	6"
66" TO 96"	8"	9"	9"
104" & LARGER	12"	12"	12"

B_d=SPECIFIED TRENCH WIDTH AT A POINT 12" ABOVE CROWN (MAX. ALLOWANCE)
B_c=PIPE O.D.
D =PIPE I.D.
d_1, d_2, d_3=DEPTH OF BEDDING MATERIAL BELOW BOTTOM OF PIPE.

NOTES:

3.1 BELL HOLES SHALL BE EXCAVATED AT ALL BELL AND SPIGOT JOINTS.

3.2 BEDDING TRENCH BACKFILL TO BE COMPACTED TO 90% DENSITY, AASHTO T-180 IN OPEN AREAS AND 95% DENSITY AASHTO T-99 IN ALL PUBLIC R.O.W.

IDEAL TRENCH CONDITIONS
15" DIA. & SMALLER
N.T.S.

CLASS "B" BEDDING MATERIAL SHALL CONSIST OF A WELL GRADED MIXTURE OF MINERAL AGGREGATE. THE AGGREGATE SHALL BE SQUEEGEE WITH A MAXIMUM AMOUNT OF FINES PASSING A NO. 200 SCREEN NOT TO EXCEED 5% BY WEIGHT. THE AGGREGATE SHALL COMPLY WITH ASTM C-33 OR ASTM D-448, GRADATION #6 OR #67. IF THE EXCAVATION FOR BEDDING IS BELOW THE WATER TABLE, THE SUB-BEDDING MATERIAL SHALL CONSIST OF 3/4-INCH TO 1-1/2-INCH CRUSHED ROCK.

SANITARY SEWER PIPE BEDDING DETAIL

MANHOLE WALL PENETRATION DETAIL

NOTES:

1. FOR FIELD CORED PENETRATIONS, LEAK SEAL IS REQUIRED.

METER VAULT DETAIL

NOTES:

1. DIMENSIONS SHOWN ARE REQUIRED UPSTREAM AND DOWNSTREAM DIAMETERS OF STRAIGHT PIPE.
2. DETAIL FOR SCHEMATIC PURPOSES ONLY, CONFIRM DIMENSIONS AND FITTINGS AS NECESSARY.
3. INSTALL METER PER MANUFACTURER'S REQUIREMENTS.
4. FLOW METER 18" MIN ABOVE MANHOLE FLOOR.

TYPICAL MH BASE CHANNELIZATION

Scale: *NONE*	Date:
Revised:	Detail:

MINIMUM BEARING SURFACE AREA
(IN SQUARE FEET)

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4"	1.00	1.00	1.00	N/A	1.50
6"	1.00	1.25	2.25	N/A	3.00
8"	1.00	2.00	4.00	N/A	5.25
12"	2.25	4.50	8.75	N/A	11.25
16"	3.75	7.50	14.50	27.00	19.00
20"	5.00	10.00	19.50	35.50	25.00
24"	7.00	14.00	27.75	51.00	36.00

NOTES:

1. ON 16" AND 20" TRANSMISSION MAINS, ALL BENDS SHALL BE BOTH RODDED AND KICKBLOCKED.
2. BEARING SURFACES SHOWN IN CHART ARE MIN.
3. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER.
   4", 6", 8" AND 12" WATER HAMMER = 110 PSI
   16", 20" AND 24" WATER HAMMER = 70 PSI
4. BASED ON 3,000 PSF SOIL BEARING CAPACITY.
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE BOTH RODDED AND KICKBLOCKED.

CONCRETE KICKBLOCKS BEARING SURFACES & INSTALLATION

NOTES:

1. SS CURB STOP/CHECK VALVE AND FITTINGS ARE PROVIDED SEPARATELY
2. TO ASSEMBLE, APPLY A DOUBLE LAYER OF TEFLON TAPE, AND A LAYER OF PIPE DOPE TO THE THREADS ON THE PLASTIC FITTINGS AND INSTALL PER THE MANUFACTURER'S INSTRUCTIONS
   *FOR SS FITTING INTO SS THREAD, USE PIPE DOPE OR TEFLON TAPE, NOT BOTH
3. ASSEMBLY IS TO BE PRESSURE TESTED
4. CURB BOX IS TO BE ORDERED SEPARATELY, SEE ABOVE

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1	100% PLANS	05/18	NPW

LIFT STATION - CONSOLIDATION

DETAILS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: JUNE 2018

JOB NUMBER: 0013.0001

SCALE: 1" = 1'

DRAWING NAME: DETAILS

SHEET: C6 OF C7

STANDARD EROSION AND SEDIMENT CONTROL PLAN NOTES:

GENERAL NOTES:

1. THE APPROVED EROSION CONTROL PLAN SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THIS PROJECT.
2. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.
3. A THOROUGH INSPECTION OF THE STORMWATER MANAGEMENT PLAN BEST MANAGEMENT PRACTICES (BMPS) IS RECOMMENDED EVERY FOURTEEN (14) DAYS AND AFTER ANY PRECIPITATION OR SNOW MELT EVENT.
4. PERIODIC INSPECTIONS SHALL ALSO INCLUDE INSPECTING EQUIPMENT FOR LEAKS AND REVIEWING EQUIPMENT MAINTENANCE PRACTICE. ALL INSPECTIONS AND MAINTENANCE SHALL BE DOCUMENTED BY THE PROJECT EROSION CONTROL SUPERVISOR AND MADE AVAILABLE TO EL PASO COUNTY AND CDPHE UPON REQUEST. ANY EROSION CONTROL BMP THAT HAS BEEN COMPROMISED OR HAS BEEN DISTURBED SHALL BE REPLACED OR RECONSTRUCTED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE ALL EROSION CONTROL BMPS IN PLACE AND EFFECTIVE PRIOR TO A STORM EVENT.
5. THE STORMWATER MANAGEMENT PLAN LOG BOOK SHALL BE UPDATED EVERY FOURTEEN (14) DAYS. THIS LOG SHALL REMAIN ON SITE AVAILABLE FOR REVIEW BY EL PASO COUNTY AND CDPHE UPON REQUEST UNTIL AN INACTIVATION NOTICE FOR CONSTRUCTION STORMWATER DISCHARGE GENERAL PERMIT CERTIFICATION HAS BEEN OBTAINED. MAINTENANCE ACTIVITIES TO CORRECT PROBLEMS NOTED DURING INSPECTIONS MUST BE DOCUMENTED AND KEPT IN THE STORMWATER MANAGEMENT PLAN LOG BOOK.
6. ALL STREETS WITHIN AND IMMEDIATELY SURROUNDING A CONSTRUCTION SITE SHALL BE CLEANED OF DIRT AND DEBRIS ON A WEEKLY BASIS. STREETS SHALL BE CLEANED BY SCRAPING AND SWEEPING THE DIRT OFF THE ROADWAYS. SCRAPED OR SWEPT MATERIAL SHALL NOT BE DEPOSITED IN THE STORM SEWER SYSTEM. DIRT TRACKED ONTO ROADWAYS AND OTHER PAVED SURFACES SHALL BE CLEANED UP BY THE END OF THE WORKDAY.
7. ALL CONSTRUCTION SITE OPERATORS SHALL CONTROL WASTE SUCH AS DISCARDED BUILDING MATERIALS, CONCRETE TRUCK WASHOUT, HAZARDOUS CHEMICALS (TO INCLUDE BUT NOT LIMITED TO HEAVY EQUIPMENT MAINTENANCE FLUIDS, MOTOR OIL, ANTIFREEZE AND VEHICLE FUEL), LITTER, AND SANITARY WASTE AT THE CONSTRUCTION SITE THAT MAY CAUSE ADVERSE IMPACTS TO STORMWATER QUALITY
8. ALL POTENTIAL POLLUTION SOURCES ON-SITE SHALL BE IDENTIFIED AND CONTROL MEASURES INSTALLED AND PRACTICED TO MINIMIZE THE LIKELIHOOD OF A RELEASE. REFER TO THE SPILL PREVENTION, CONTROL, AND COUNTERMEASURE (SPCC) PLAN FOR MEASURES TO RESPOND TO ANY SPILLS, LEAKS OR OTHER RELEASES.
9. ALL PORTABLE TOILET FACILITIES SHALL BE LOCATED AWAY FROM GUTTERS, INLETS DITCHES, DRAINAGEWAYS, RECEIVING WATERS AND AREAS SUSCEPTIBLE TO FLOODING OR DAMAGE BY CONSTRUCTION EQUIPMENT.
10. ALL PORTABLE TOILET FACILITIES SHALL BE SECURED IN PLACE BY STAKES INTO THE GROUND TO PREVENT TIPPING.
11. STOCKPILES INCLUDING LANDSCAPING MATERIALS, EARTH MATERIALS AND DIRT FROM GRADING OR EXCAVATION SHALL NOT BE LOCATED ADJACENT TO WATERWAYS; SHALL BE STABILIZED WITHIN FOURTEEN (14) DAYS OF ESTABLISHMENT BY SURFACE ROUGHENING, SEEDING, AND MULCHING; AND SHALL NOT EXCEED TEN FEET IN HEIGHT.
12. SLOPES 3:1 OR STEEPER SHALL BE PROTECTED WITH BIODEGRADABLE EROSION CONTROL BLANKETS.
13. ALL MATERIAL IMPORTED TO OR EXPORTED FROM THE SITE SHALL BE PROPERLY COVERED TO PREVENT THE LOSS OF MATERIAL DURING TRANSPORT. HAUL ROUTES MUST BE PRE-APPROVED BY THE COUNTY. NO MATERIAL SHALL BE TRANSPORTED TO ANOTHER SITE WITHOUT FIRST OBTAINING A HAULING PERMIT FROM THE ADAMS COUNTY.
14. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL CONTAIN ALL WASHOUT WATER. STORMWATER SHALL NOT CARRY WASTES FROM WASHOUT LOCATION.
15. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE LOCATED A MINIMUM OF FIFTY (50) FEET HORIZONTAL FROM WATERS OF THE STATE. THE CONCRETE WASHOUT CONTAINMENT STRUCTURE SHALL BE SIGNED AS - CONCRETE WASHOUT.

BMP MAINTENANCE NOTES:

1. IT IS ANTICIPATED THAT THE BMPS IMPLEMENTED AT THE SITE WILL HAVE TO BE MODIFIED TO ADAPT TO CHANGING CONDITIONS OR TO ENSURE THAT POTENTIAL POLLUTANTS ARE BEING PROPERLY MANAGED AT THE SITE.
2. ALL INLET/OUTLET PROTECTIONS WILL BE CHECKED FOR MAINTENANCE AND FAILURE. SEDIMENT SHALL BE REMOVED AND PROPERLY DISPOSED OF ONCE IT HAS ACCUMULATED TO HALF THE DESIGN OF THE TRAP.
3. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY, OR CONTAINED UNTIL APPROPRIATE CLEANUP METHODS CAN BE EMPLOYED. MANUFACTURE'S RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE FOLLOWED, ALONG WITH PROPER DISPOSAL METHODS.
4. EACH CONCRETE TRUCK OPERATOR SHALL BE AWARE OF THE DESIGNATED CONCRETE WASHOUT AREA.
5. THE CONTRACTOR SHALL CHECK THE CAPACITY FOR ALL CONCRETE WASHOUT AREAS. WASTE MATERIALS MUST BE REMOVED BY THE CONTRACTOR AND LEGALLY DISPOSED OF WHEN ACCUMULATIONS AMOUNT TO TWO-THIRDS OF THE WET STORAGE CAPACITY OF THE STRUCTURE.
6. ALL CONCRETE WASHOUT AREAS SHALL BE CLEARLY MARKED. THE CONCRETE WASHOUT CONTAINMENT DETAIL WILL INCLUDE ORANGE PLASTIC CONSTRUCTION FENCING OR EQUIVALENT AROUND THE WASHOUT STRUCTURE AND A SIGN POSTED WITH THE WORDS CONCRETE WASHOUT.
7. THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND/OR ENLARGED AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE.
8. AT THE END OF CONSTRUCTION, ALL CONCRETE SHALL BE REMOVED FROM THE SITE AND LEGALLY DISPOSED OF AT AN APPROVED WASTE SITE.
9. ALL SEDIMENT SHALL BE REMOVED UPON INITIAL ACCEPTANCE FROM TEMPORARY SEDIMENT BASINS AND STORM SEWER FACILITIES, I.E., PIPES, OUTLETS AND INLETS. THIS SEDIMENT SHALL NOT BE FLUSHED OFF-SITE, BUT SHALL BE CAPTURED ON-SITE AND DISPOSED OF AT AN APPROVED LOCATION AS DIRECTED BY AUTHORIZED EL PASO COUNTY PERSONNEL.

Silt Fence (SF) **SC-1**

SILT FENCE

SECTION A

SF-1. SILT FENCE

SC-1 **Silt Fence (SF)**

SILT FENCE INSTALLATION NOTES

1. SILT FENCE MUST BE PLACED AWAY FROM THE TOE OF THE SLOPE TO ALLOW FOR WATER PONDING. SILT FENCE AT THE TOE OF A SLOPE SHOULD BE INSTALLED IN A FLAT LOCATION AT LEAST SEVERAL FEET (2-5 FT) FROM THE TOE OF THE SLOPE TO ALLOW ROOM FOR PONDING AND DEPOSITION.

2. A UNIFORM 6" X 4" ANCHOR TRENCH SHALL BE EXCAVATED USING TRENCHER OR SILT FENCE INSTALLATION DEVICE. NO ROAD GRADERS, BACKHOES, OR SIMILAR EQUIPMENT SHALL BE USED.

3. COMPACT ANCHOR TRENCH BY HAND WITH A "JUMPING JACK" OR BY WHEEL ROLLING. COMPACTION SHALL BE SUCH THAT SILT FENCE RESISTS BEING PULLED OUT OF ANCHOR TRENCH BY HAND.

4. SILT FENCE SHALL BE PULLED TIGHT AS IT IS ANCHORED TO THE STAKES. THERE SHOULD BE NO NOTICEABLE SAG BETWEEN STAKES AFTER IT HAS BEEN ANCHORED TO THE STAKES.

5. SILT FENCE FABRIC SHALL BE ANCHORED TO THE STAKES USING 1" HEAVY DUTY STAPLES OR NAILS WITH 1" HEADS. STAPLES AND NAILS SHOULD BE PLACED 3" ALONG THE FABRIC DOWN THE STAKE.

6. AT THE END OF A RUN OF SILT FENCE ALONG A CONTOUR, THE SILT FENCE SHOULD BE TURNED PERPENDICULAR TO THE CONTOUR TO CREATE A "J-HOOK." THE "J-HOOK" EXTENDING PERPENDICULAR TO THE CONTOUR SHOULD BE OF SUFFICIENT LENGTH TO KEEP RUNOFF FROM FLOWING AROUND THE END OF THE SILT FENCE (TYPICALLY 10' - 20').

7. SILT FENCE SHALL BE INSTALLED PRIOR TO ANY LAND DISTURBING ACTIVITIES.

SILT FENCE MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM USDCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

SC-5 **Rock Sock (RS)**

ROCK SOCK SECTION ROCK SOCK PLAN

ROCK SOCK JOINTING

GRADATION TABLE	
SIEVE SIZE	MASS PERCENT PASSING SQUARE MESH SIEVES
	NO. 4
2"	100
1½"	90 - 100
1"	20 - 55
¾"	0 - 15
⅜"	0 - 5
MATCHES SPECIFICATIONS FOR NO. 4 COARSE AGGREGATE FOR CONCRETE PER AASHTO M43. ALL ROCK SHALL BE FRACTURED FACE, ALL SIDES.	

ROCK SOCK INSTALLATION NOTES

1. SEE PLAN VIEW FOR:
   -LOCATION(S) OF ROCK SOCKS.
2. CRUSHED ROCK SHALL BE 1½" (MINUS) IN SIZE WITH A FRACTURED FACE (ALL SIDES) AND SHALL COMPLY WITH GRADATION SHOWN ON THIS SHEET (1½" MINUS).
3. WIRE MESH SHALL BE FABRICATED OF 10 GAGE POULTRY MESH, OR EQUIVALENT, WITH A MAXIMUM OPENING OF ½". RECOMMENDED MINIMUM ROLL WIDTH OF 48"
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF SOCKS.
5. SOME MUNICIPALITIES MAY ALLOW THE USE OF FILTER FABRIC AS AN ALTERNATIVE TO WIRE MESH FOR THE ROCK ENCLOSURE.

RS-1. ROCK SOCK PERIMETER CONTROL

Rock Sock (RS) **SC-5**

ROCK SOCK MAINTENANCE NOTES

1. INSPECT BMPs EACH WORKDAY, AND MAINTAIN THEM IN EFFECTIVE OPERATING CONDITION. MAINTENANCE OF BMPs SHOULD BE PROACTIVE, NOT REACTIVE. INSPECT BMPs AS SOON AS POSSIBLE (AND ALWAYS WITHIN 24 HOURS) FOLLOWING A STORM THAT CAUSES SURFACE EROSION, AND PERFORM NECESSARY MAINTENANCE.

2. FREQUENT OBSERVATIONS AND MAINTENANCE ARE NECESSARY TO MAINTAIN BMPs IN EFFECTIVE OPERATING CONDITION. INSPECTIONS AND CORRECTIVE MEASURES SHOULD BE DOCUMENTED THOROUGHLY.

3. WHERE BMPs HAVE FAILED, REPAIR OR REPLACEMENT SHOULD BE INITIATED UPON DISCOVERY OF THE FAILURE.

4. ROCK SOCKS SHALL BE REPLACED IF THEY BECOME HEAVILY SOILED, OR DAMAGED BEYOND REPAIR.

5. SEDIMENT ACCUMULATED UPSTREAM OF ROCK SOCKS SHALL BE REMOVED AS NEEDED TO MAINTAIN FUNCTIONALITY OF THE BMP, TYPICALLY WHEN DEPTH OF ACCUMULATED SEDIMENTS IS APPROXIMATELY ½ OF THE HEIGHT OF THE ROCK SOCK.

6. ROCK SOCKS ARE TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND APPROVED BY THE LOCAL JURISDICTION.

7. WHEN ROCK SOCKS ARE REMOVED, ALL DISTURBED AREAS SHALL BE COVERED WITH TOPSOIL, SEEDED AND MULCHED OR OTHERWISE STABILIZED AS APPROVED BY LOCAL JURISDICTION.

(DETAIL ADAPTED FROM TOWN OF PARKER, COLORADO AND CITY OF AURORA, COLORADO, NOT AVAILABLE IN AUTOCAD)

NOTE: MANY JURISDICTIONS HAVE BMP DETAILS THAT VARY FROM USDCD STANDARD DETAILS. CONSULT WITH LOCAL JURISDICTIONS AS TO WHICH DETAIL SHOULD BE USED WHEN DIFFERENCES ARE NOTED.

NOTE: THE DETAILS INCLUDED WITH THIS FACT SHEET SHOW COMMONLY USED, CONVENTIONAL METHODS OF ROCK SOCK INSTALLATION IN THE DENVER METROPOLITAN AREA. THERE ARE MANY OTHER SIMILAR PROPRIETARY PRODUCTS ON THE MARKET. USDCD NEITHER INDORSES NOR DISCOURAGES USE OF PROPRIETARY PROTECTION PRODUCTS; HOWEVER, IN THE EVENT PROPRIETARY METHODS ARE USED, THE APPROPRIATE DETAIL FROM THE MANUFACTURER MUST BE INCLUDED IN THE SWMP AND THE BMP MUST BE INSTALLED AND MAINTAINED AS SHOWN IN THE MANUFACTURER'S DETAILS.

PORTABLE CONCRETE WASHOUT CONTAINER

DESCRIPTION
A portable, self-contained and watertight container affixed with ramps that controls, captures and contains caustic concrete wastewater and washout material.

PURPOSE & OBJECTIVE
Allows trade personnel to easily washout concrete trucks, pumps and other equipment associated with cement on site and allows easy off site recycling of the same concrete materials and wastewater.

APPLICATION
Construction projects where concrete, stucco, mortar, grout and cement are used as a construction material or where cementitious wastewater is created.

MAINTENANCE
Inspect and clean out when ¾ full, not allowing the container to overflow.
Inspect wastewater level and request a vacuum if needed.
Inspect subcontractors to ensure that proper housekeeping measures are employed when washing out equipment.

SPECIFICATIONS
The container must be portable and temporary, watertight, equipped with ramps and have a holding capacity to accept washout from approximately 350 yards of poured concrete. A vacuum service must accompany washout container and be used by site superintendent as needed. A rampless container may be used in conjunction with a ramped container or by itself if a concrete pump is not needed. The washwater must be disposed of or treated and recycled in an evironmentally safe maanner and in accordance with federal, state or local regulatory guidelines.

TARGETED POLLUTANTS
Caustic wastewater (high pH level near 12 units)
Suspended solids
Assorted Metals; Chromium VI, Nickel, Sulfate, Potassium, Magnesium and Calcium Compounds

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	100% PLANS	05/18	NPW

LIFT STATION - CONSOLIDATION

EROSION CONTROL

ARROWHEAD MOBILE HOME PARK
AND RV RESORTS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
1" = 1'

DRAWING NAME
EROSION

SHEET
C7 OF C7

EXHIBIT G – TECHNICAL SPECIFICATIONS

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TECHNICAL SPECIFICATIONS

ARROWHEAD MOBILE HOME PARK
LIFT STATION
BASIS OF DESIGN REPORT

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03410	PRECAST STRUCTURAL CONCRETE	6
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SECTION 00000
GENERAL INFORMATION

PART 1.0 - DEFINITION

Technical Standards and Specifications to be used for this project shall be as detailed in the Contract Documents for the Arrowhead Mobile Home Park Lift Station Project.

PART 2.0 – CONTACT INFORMATION

Owner – Dayton and Leah Orsburn, Co-Trustees

P.O. Box 154
Chino Hills, CA 91709
(909) 576-1324

Emergency Contact – Rhonda Folden, Park Manager

75 N. Curtis Road, Unit 12
Colorado Springs, CO 80930
(719) 683-2727

Operator in Responsible Charge – Paul E. Grant II, Contract Operator

75 N. Curtis Road, Unit 12
Colorado Springs, CO 80930
(719) 303-0411

Engineer – Element Engineering, LLC or the Owner's duly authorized representative responsible for the engineering supervision of the Construction.

Nicholaus P. Marcotte, P.E.
President
12687 W Cedar Drive, Suite 300
Lakewood, CO 80228
(303) 378-2969
nmarcotte@elementengineering.net

END OF SECTION

SECTION 02200
SITE PREPARATION AND EARTHWORK

PART 1.0 - GENERAL

1.01 Summary

A. This Section includes site preparation activities and items of earthwork necessary to complete the project.

1.02 Submittals

A. Submit to Engineer for approval the name, location, and qualifications of the testing laboratory selected for compaction testing.

B. Submit compaction test reports to Engineer as work progresses.

1.03 Quality Assurance

A. Standards:

1. American Society of Testing and Materials (ASTM):

D698 - Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft)

D1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method

D1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3(2,700 kN-m/m3))

D2167 - Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method

D2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)

D2937 - Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method

D4253 - Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table

D4718 - Standard Practice for Correction of Unit Weight and Water Content for Soils Containing Oversize Particles

2. American Association of State Highway and Transportation Officials Standard Method of Test (AASHTO):

T-96 - Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact by the Los Angeles Machine.

T-99 - The Moisture-Density Relations of Soils Using a 2.5 kG (5.5 lb) Rammer and a 305 mm (12 in) Drop.

T104 - Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate Test.

B. Testing:

1. An acceptable testing laboratory shall be selected and paid for by the Contractor to perform all required laboratory and field soil testing necessary to demonstrate compliance with compaction requirements. Geotechnical testing agency shall be qualified according to ASTM D 698 or ASTM D 1557.

1.04 Site Conditions

A. Lines and grades shall be as indicated. Layout and construct the work from control data furnished or established as specified.

B. Carefully maintain all bench marks, monuments and other reference points and replace as directed if disturbed or destroyed.

C. Do not close or obstruct streets, walks, or other adjacent or used facilities without advance permission from Owner and authorities having jurisdiction.

D. Do not proceed with earth moving work until temporary site fencing and erosion and sedimentation control measures are in place.

E. Utility Locator Service: Notify On-Call for area where project is located prior to beginning earth moving operations.

F. Disposition of Existing Facilities, Structures and Property:

1. Adequately protect from damage all existing utilities, structures and property and remove or relocate only as indicated, specified or as directed by the Engineer.

2. Report inactive and abandoned utilities encountered in excavating and grading operations. Remove, plug, or cap as directed.

3. Confine operations to that area provided through easements, licenses, agreements and rights-of-way. The Contractor’s entrance upon any lands outside of that area provided by easements, licenses, agreements or public rights-of-way, shall be at the Contractor's sole liability.

PART 2.0 - PRODUCTS

2.01 Materials

A. Materials Classification:

1. All materials encountered, regardless of type, character, composition, or condition thereof, shall be unclassified.

B. Material properties for compaction:

1. Cohesionless materials include gravels, gravel-sand mixtures, sands and gravelly sands exclusive of clayey and silty material - materials which are free-draining and for which impact compaction will not produce a well-defined moisture-density relationship curve and for which the maximum density by impact methods will generally be less than by vibratory methods.

2. Cohesive materials include silts and clays generally exclusive of sands and gravel - materials for which impact compaction will produce a well-defined moisture-density relationship curve.

C. Waste Materials:

1. Includes excess suitable material and material unsuitable for use in the Work.

2. Remove from work area as excavated.

3. Keep excess suitable material segregated from other waste material.

4. Legally dispose of waste material off site.

D. Borrow Materials (Not Used)

E. Granular Fill and Pipe Embedment Materials.

1. Squeegee as specified below:

Product 4515-Squeegee
Specification Squeegee S&T

Sieve/Test	Tests	Average	St Dev	Target	Specification
3/8" (9.5mm)	6	100	0.0	100-100	100-100
#4 (4.75mm)	6	83	7.7	61-91	60-100
#8 (2.36mm)	6	18	6.4	5-35	0-45
#16 (1.18mm)	6	5	3.5	1-25	0-30
#30 (0.6mm)	6	2	2.1	1-7	
#50 (0.3mm)	6	1	1.4	1-6	0-6
#100 (0.15mm)	6	1	0.7	0-2	
#200 (75um)	6	0.3	0.36	0-1	0-2
Pan	6	0.0	0.00		

F. Topsoil Materials:

1. Includes those materials obtained from excavation or borrow area(s) which are free from roots, rocks and debris and which are suitable for supporting growth of vegetation.

G. Backfill Materials:

1. Native material may be used for backfill if approved by the Engineer. No rocks or stones greater than 3-inches in diameter may be included in the backfill material. This shall supersede any recommendations made in the geotechnical report.

2. Include suitable approved materials from excavations and borrow area(s).

3. Shall be friable sandy or silty clay containing fine material sufficient to provide a dense mass free of voids and capable of satisfactory compaction.

4. Shall be free of roots or other organic matter, refuse, cinders, ice, snow, frozen earth, or other unsuitable matter.

PART 3.0 - EXECUTION

3.01 Clearing and Grubbing

A. Perform clearing and grubbing where indicated and as necessary to perform excavation, trenching, embankment, borrow and other work required.

B. Clearing:

1. Clearing includes felling and disposal of trees and brush. Remove only those trees necessary for prosecution of the work. Preserve and protect all trees not specifically required to be removed.

2. Temporarily remove existing fences within the limits of clearing.

C. Grubbing:

1. Removal and disposal of tree stumps and roots larger than 3 inches in diameter.

2. Remove to a depth of at least 18 inches below existing grade.

3. Backfill all excavated depressions with approved material and grade to drain.

3.02 Demolition

A. Remove existing equipment or structures as indicated, or as required to perform new construction.

B. Materials not indicated or specified to be relocated or returned to Owner shall be disposed of as specified in "Disposal of Debris" in this section.

C. Obstructions:

1. Sidewalks, driveways, curb and gutter, drainage structures and similar obstructions permitted to be removed shall be cut in straight lines or removed to the nearest construction joint if located within five feet of the edge of the excavation. In no case shall the joint or line of cut be less than one foot outside the edge of the excavation. Surface obstructions removed to permit construction shall be reconstructed as specified and to the dimensions, lines and grades of original construction.

2. Fences interfering with construction and located within public rights-of-way or as may be allowed for in permits or agreements, may be removed by the Contractor. Provide narrow trench openings in fence with a temporary gate, maintained in a closed position except to permit passage of equipment and vehicles. Fences within temporary construction easements may be removed by the Contractor provided that temporary fencing is installed in such a manner as to serve the purpose of the fencing removed. The Contractor shall coordinate with the Owner of the fence prior to removing fence. The Contractor shall locate and record all fence corners prior to removal. Restore all removed fencing to the condition existing prior to construction unless otherwise specified or directed. The Contractor shall be solely liable for the straying of any fenced or corralled animals or other damage caused by any fence so removed.

3.03 Stripping

A. Remove topsoil from areas within limits of excavation, trenching, borrow and areas designed to receive embankment or compacted fill.

B. Scrape areas clean of all brush, grass, weeds, roots and other unsuitable material.

C. Strip to a minimum depth of 6 inches, and to a sufficient depth to remove excessive roots in heavy vegetation or brush areas and as required to segregate topsoil.

D. Stockpile topsoil reasonably free of subsoil, debris and stones larger than 2-inch diameter, in sufficient quantity to complete the work. Stockpile shall not interfere with construction operations and existing facilities.

3.04 Disposal of Debris

A. Dispose of debris off the jobsite in an approved manner and at a location provided by the Contractor.

3.05 Excavation Support

A. Support excavations and slopes using sheeting, bracing, or other means as necessary to:

1. Protect life and property.

2. Conform to Federal, State and local regulations.

3. Avoid excessively wide cuts in unstable material.

4. Protect existing structures and facilities from soil movement.

B. Plan layout of excavation operations to protect adjacent property and existing structures and facilities.

C. Take precautions against movement or settlement of existing structures. Establish and record elevations of existing facilities near excavations before excavating. Remove sheeting and bracing in a manner that does not create voids or induce settlement of adjacent soil.

D. If existing or adjacent structures show structural distress, or become endangered by any condition or event, cease operations immediately and notify Engineer. Do not resume operations prior to correction or modification of procedures leading to the unstable condition.

3.06 Excavation

A. General:

1. Includes excavation for the installation to the alignment and elevation indicated of ground wires, electrical conduits, storm drainage pipes, process piping and structures.

B. Trenches:

1. Ground Wires and Electrical Conduits:

a. Remove material required for alignment and elevation, or minimum depth of installation.

2. Pipes:

a. Trench depth to provide embedment and to remove unsuitable bottom material.

b. Trench width, at top of pipe and below, to be between pipe outside diameter plus 1 foot (minimum) and plus 2.25 foot (maximum).

c. Trench walls to be vertical below the top of pipe and may be vertical or sloped above top of pipe as determined by the stability of the material being trenched.

d. Trenches to be sheeted and braced when required.

e. Maximum length of open trench shall comply with local codes and shall not exceed 200 feet.

f. Erect barriers or other appropriate protection to prohibit accidental or unauthorized entry of persons into trenches.

C. Structures: Perform as specified for "Trenches" and as follows:

1. Excavate area adequate to permit erection and removal of forms.

2. Trim to neat lines where concrete is to be deposited against earth.

3. Excavate by hand in areas where space and access will not permit use of machines.

4. Notify Engineer immediately when excavation has reached the depth indicated. Do not proceed further until approved.

5. Restore bottom of excavation to proper elevation in areas over excavated, as follows:

a. For structures supported by piles or caissons, with compacted embankment.

b. For structures supported by concrete footings or mats, with concrete.

6. Excavate rock, where encountered, to a distance of at least three (3) feet away from outside of structure walls. Bench any additional rock excavation required for stability during construction to maintain vertical cuts. Perform such additional excavation and furnish any additional backfill subsequently required at no extra cost to Owner.

D. Rock Excavation:

1. Rock excavation shall consist of igneous, metamorphic and/or sedimentary rock which cannot be excavated without blasting and cannot be excavated with rock teeth (rock rippers).

E. Blasting (Not Used for This Project):

1. Comply with the requirements of all local blasting codes and ordinances.

2. Continuous seismographic records shall be kept at all structures within 300 feet of blasting operations. The seismograph shall be a tape type unit with reproducible waveform, self-calibrated and self-triggering.

3. The maximum peak particle velocity at any structure as a result of the Contractor's efforts shall not exceed 1-inch per second.

4. Provide suitable weighted plank coverings, mattresses, or backfill to confine all materials lifted by the blasting to the limits of the trench or excavation.

5. Notify the Engineer prior to initiation of blasting.

3.07 Dewatering (If Necessary)

A. Control grading around excavations to prevent surface water from flowing into excavation.

B. Drain or pump surface and groundwater as required to continually maintain all excavations and trenches free of water or mud. Commence when water first appears and continue until work is complete to the extent that no damage will result from the presence of water.

C. Discharge to approved drains or channels. The Contractor shall obtain State or local permits for discharge. Water discharged to streams shall be free of silt and other objectionable materials and shall be in compliance with all State requirements per the discharge permit requirements. Discharge water so that the work in progress and other properties are not damaged. Do not interfere unduly with the use of streets, alleys, private drives, or entrances.

D. Use pumps of adequate capacity to ensure rapid drainage.

E. Construct and use drainage channels and subdrains as required.

F. Remove unsuitable excessively wet materials and replace with approved material.

3.08 Stockpiling

A. Stockpile in amounts sufficient for and in a manner to segregate materials suitable for backfilling trenches and structures.

B. Do not obstruct or prevent access to roads and drives with stockpiles.

C. Do not obstruct drainage patterns.

3.09 Compaction and Testing for Embankment, Backfilling, and Subgrade

A. Perform wetting or drying of compacted material as required to obtain specified density. Moisture content at time of placement shall not be less than optimum or more than 4 percent above optimum as determined by ASTM D 698.

B. Do not place snow, ice or frozen earth in compacted soil and do not place compacted soil on a frozen surface.

C. Remove waste material, trees, organic material, rubbish, or other deleterious substances from soil to be compacted.

D. An acceptable testing laboratory shall be selected and paid for by the Contractor to perform all laboratory and field soil testing necessary to demonstrate compliance with compaction requirements. The soil density testing frequency shall be as follows:

1. For trenches, density tests representative of each two (2) feet of trench depth shall be taken at two hundred (200) linear foot intervals along the lines. Concentrate tests at cross streets and drives.

E. Perform testing in accordance with ASTM D 698 where AASHTO T-99 or "Standard Proctor" has been indicated. AASHTO T-99 may be used only with prior written approval of the Engineer.

F. Follow all county compaction testing requirements within county right-of-way.

3.10 Embankment (Not Used)

3.11 Backfilling

A. Place backfill to the elevations indicated.

B. In areas requiring 95 percent compaction, place backfill in lifts not exceeding six (6) inches (uncompacted depth). Place in twelve (12) inch maximum lifts in other areas.

C. Obtain compaction specified by normal methods and equipment. Accomplish without inundation or flooding.

D. Complete promptly after approval to proceed.

E. Backfill failing to meet specified densities shall be removed or scarified and recompacted to meet specified densities.

F. Dispose of acceptable topsoil materials.

G. Trenches:

1. Backfill pipes in 6-inch lifts deposited alternately on opposite sides of pipe to a plane 12 inches above pipe.

2. Compact backfill to 95 percent of maximum density (ASTM D 698) under all areas to be surfaced with concrete, asphaltic concrete, or gravel, including streets, drives, sidewalks, and parking areas, and under developed lots and lawns.

H. Structures:

1. Backfill pipes in 6-inch lifts around the structure.

2. Compact backfill to 95 percent of maximum density (ASTM D 698) under all areas to be surfaced with concrete, asphaltic concrete, or gravel, including streets, drives, sidewalks, and parking areas, and under developed lots and lawns.

3.12 Subgrade Preparation

A. General:

1. Excavate or place embankment as required to construct subgrades to elevations and grades indicated.

2. Remove all unsuitable material and replace with approved material. Perform all wetting, drying, shaping, and compacting required to prepare a suitable subgrade.

B. Roughen subgrade for embankment by discing or scarifying and wet or dry the top 6 inches as required to insure bond with embankment.

C. Extend subgrade the full width of surfaced areas plus one foot.

D. Compact the top six inches of subgrades for traffic areas and slabs on grade to 95 percent of maximum density (ASTM D 698).

E. Proof roll subgrade after moisture conditioning and compaction to identify soft or disturbed areas. Use a fully loaded tandem axle dump truck or equipment providing an equivalent loading for proofrolling. Undercut and replace soft areas identified by proofrolling with structural backfill if so directed by the Engineer.

3.13 Granular Fill Pipe Embedment

A. Place in trench to limits indicated. Provide for proper support of pipe and even distribution around pipe.

B. Compact as indicated, in lifts not to exceed 6 inches, using approved vibratory equipment.

3.14 Placement of Topsoil

A. Place topsoil on all areas indicated.

B. Placement:

1. Clear site of vegetation heavy enough to interfere with proper grading and tillage operations.

2. Clear surfaces of all stones or other objects larger than 3 inches in thickness or diameter, all roots, brush, wire, grade stakes, or other objectionable material.

3. Loosen subgrade by discing or scarifying to a depth of 2 inches wherever compacted by traffic or other causes to permit bonding of the topsoil to the subgrade.

4. Distribute topsoil over required areas without compaction other than that obtained with spreading equipment.

5. Place material within following limits:

a. Not less than four (4) inches in depth.

b. Not more than six (6) inches in depth.

6. Shape cuts, fills and embankments to contours indicated.

7. Grade to match contours of adjacent areas and permit good natural drainage.

8. Grade a gentle mound over trenches.

C. After spreading topsoil, clear surface of stones or other objects larger than two (2) inches in thickness or diameter and of objects that might interfere with planting and maintenance operations.

D. Protect areas from erosion until grass is established. Repair eroded areas as required.

3.15 Maintenance and Repair

A. Maintenance:

1. Protect newly graded areas from actions of the elements.

2. Settling or erosion shall be filled, repaired and grades reestablished to elevations and slopes indicated.

B. Correction of Settlement:

1. Settlement of embankments, backfill, or trenches occurring within the Two-Year Correction Period after substantial completion shall indicate defective work and shall be promptly corrected if the settlement results in the following:

    a. Visible depressions, ruts, or ground slumping.

    b. Pooling of water where positive slope existed or has been required.

    c. Voids beneath or beside slabs or structures.

    d. Movement of soil exposing unfinished or waterproofed structure surfaces.

    e. Movement of structures or facilities, including but not limited to foundation settlement, differential settlement, cracking, misalignment of adjacent objects, or movement of vertical elements out of plumb.

2. Contractor shall correct settlement and damages arising from or attributable to the settlement.

3. Make repairs within ten (10) days from and after due notification by Owner of embankment or backfill settlement and resulting damage.

4. Make own arrangements for access to the site for purposes of correction and maintenance of corrected areas.

END OF SECTION

SECTION 02310
EARTHWORK - PIPELINES

PART 1.0 - GENERAL

1.01 EARTHWORK DEFINED

Earthwork shall include all necessary clearing, grubbing, grading and excavating for pipelines and appurtenances, backfilling, compacting and disposing of excess excavated material as required for the complete performance of the work for the installation of pipelines and appurtenances, all as indicated on the plans and as specified herein.

Earthwork, including grading as referred to herein or in connection herewith, shall be construed as including any or all of the following described operations:

Excavating all classes of whatever substance encountered; backfilling, fine grading as finished for unpaved areas; preparing right-of-way, subgrading for pipe; and performing any other similar, incidental or appurtenant earthwork operation which may be necessary to properly complete the entire work indicated and specified.

1.02 SCOPE OF WORK

The Contractor shall furnish all services, labor, materials, equipment and perform all operations in connection with all earthwork necessary for the construction of such scheduled contract units as are awarded to him, together with appurtenances; thereto, all as the removal of water and all material of whatever nature and shall include clearing of sites for construction.

1.03 EARTHWORK IN STATE, COUNTY, AND CITY RIGHTS-OF-WAY

Earthwork within the right-of-way of the State Department of Transportation, the County Road Department and the respective cities, shall be done in accordance with requirements and provisions of the permits issued by those agencies for the construction within their respective rights-of-way. Such requirements and provisions, where applicable, shall take precedence and supersede the provisions of these specifications. It shall be the Contractor's responsibility to secure all required permits and the cost of said permits shall be included in the applicable prices for the associated work.

1.04 SAFETY PRECAUTIONS

All excavations shall be performed, protected, and supported as required for safety and in the manner set forth in the operation rules, orders and regulations prescribed by the OSHA Federal Register. Barriers shall be placed at each end of all excavations to warn all pedestrian and vehicular traffic of such excavations. Lights shall also be placed along excavations from sunset each day to sunrise of the next day until such excavation is entirely refilled.

1.05 OBSTRUCTIONS

The Contractor's attention is directed to the possible existence of pipe and other underground improvements which may or may not be shown on the plans. All reasonable precautions shall be taken to preserve and protect any such improvements whether shown on the plans or not. Where it is necessary to remove and replace or to relocate such improvements in order to prosecute the work, they shall be removed, maintained in operation and permanently replaced by the Contractor at his expense.

PART 2.0 - MATERIAL

2.01 GRANULAR SOIL

Wherever the term "granular soil" is issued in these specifications, it shall be defined as a soil having a minimum sand equivalent of 30 as determined in accordance with quality requirements of AASHTO M 147, and not more than 20% of it will pass through a 200-mesh sieve.

2.02 SAND BACKFILL

The sand shall be natural bank sand, graded from fine to coarse, not lumpy or frozen and free from slag, cinders, ashes, rubbish or other material that, in the opinion of the ENGINEER, is objectionable or deleterious. The sand shall not contain a total of more than 10%, by weight of loam or clay, and all material must be capable of being passed through a three eights inch sieve. Not more than 5% shall remain on a No. 4 sieve.

2.03 CRUSHED ROCK OR GRAVEL FOR PIPE BEDDING

Where crushed rock or gravel is specified in the bedding detail on the plans, the material shall have the following gradations:

Sieve Sizes	No.3 Rock % Passing	No.4 Rock % Passing	ASTM No. 67 % Passing
1-1/2"	100	-	-
1"	90-100	-	-
3/4"	60-80	100	90-100
3/8"	0-15	90-100	29-55
No. 4	0-5	0-15	0-15
No. 8	`-	0-5	0-5

Unless otherwise specified, No. 3 rock shall be used for pipes with inside diameters of 27-inches and larger and No. 4 rock shall be used for pipes with inside diameters of 24-inches and less.

2.04 BACKFILL MATERIAL

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rock or stones or other material that, in the opinion of the Engineer, is unsuitable.

2.05 USE OF EXCAVATED MATERIAL AS BACKFILL

The Contractor may backfill with the excavated materials, provided that such material consists of loam, clay, sand, gravel or other materials that, in the opinion of the Engineer, are suitable for backfilling.

PART 3.0 - EXECUTION

3.01 CLEARING AND GRUBBING

Areas where construction is to be performed shall be cleared of all trees, shrubs, rubbish and other objectionable material of any kind which, if left in place, would interfere with the proper performance or completion of the contemplated work, would impair its subsequent use or form obstructions therein. Trees and other natural growths outside the actual lines of construction operations shall not be destroyed and such measures as are necessary shall be taken by the Contractor for the protection thereof.

Organic material from clearing and grubbing operations will not be incorporated in excavation backfill.

It shall be the Contractor's responsibility to remove and dispose of all excess material resulting from clearing and grubbing operations at his own expense. The Contractor shall make his own arrangements for disposal sites at his own expense, at which said material may be wasted. The provisions of EXCESS EXCAVATED MATERIALS, of these specifications, shall apply to disposal of such material.

3.02 EXCAVATION AND BACKFILL FOR PIPELINES

A. Excavation

Excavation for pipelines, fittings, and appurtenances shall be open trench to the depth and in the direction necessary for the proper installation of the same as shown on the contract drawings or as otherwise approved by the Engineer. Any water which may be encountered or may accumulate in the excavation shall be pumped out or otherwise removed as necessary to keep the bottom of the excavation free and clear of water during the progress of the work.

Tunneling may be permitted as indicated by economy of construction of necessity of preserving existing improvements. If the earth in the tunnel sloughs off, the roof of the tunnel shall be broken down, and the trench excavated as an open trench.

B. Limit of Excavation

Except by expressed written permission of the Engineer, the maximum length of open trench shall be 200 feet, or the distance necessary to accommodate the amount of pipe installed in a single day, whichever is the greater. The distance is the collective length at any location, including open excavation, pipe laying and appurtenances, construction and backfill which has not been temporarily resurfaced.

C. Trench Width

The overall trench width shall not be more than 30-inches nor less than 12-inches wider than the largest outside diameter of the pipe to be laid therein, measured at a point 12-inches above the top of the pipe, exclusive of branches. Excavating and trenching shall be true to line so that a clear space of not more than 8-inches or less than 6-inches in width is provided on each side of the largest outside diameter of the pipe in place. For the purpose of this section, the largest outside diameter shall be the outside diameter of the bell, on bell and spigot pipe.

Where the trench width, measured at a point 12-inches above the top of the bell of the pipe, is wider than the maximum set forth above, the trench area around the pipe shall be backfilled with Class A concrete to form a cradle for the pipe as shown on the plans and in accordance with the American Concrete Pipe Association's standards. Special care shall be used when pouring the concrete cradle around the pipe so no displacement will occur. In the event of movement, the Contractor shall remove and replace all pipe and cradle affected. The price paid for water/sewer pipe in-place shall include full compensations for constructing concrete cradles as above specified and no additional allowance will be made therefor.

D. Excavation Below Grade

The trench shall be excavated to a minimum depth of 6-inches below the bottom of the pipe. Before the pipe is laid, the subgrade shall be made by backfilling with an approved material in 3-inch uncompacted layers. The layers shall be thoroughly tamped as directed by the Engineer so as to provide a continuous bearing and support for the pipe at every point between coupling or bell holes, except that it will be permissible to disturb and otherwise damage the finished surface over a maximum length of 18-inches near the middle of each length of pipe by the withdrawal of pipe slings or other lifting tackle. The finished subgrade shall be prepared accurately by means of hand tools.

E. Correction of Faulty Grades

Where excavation is inadvertently carried below subgrade and/or foundation elevations, suitable provision shall be made at the expense of the Contractor for adjustment of same, as directed by the Engineer to meet requirements incurred by the deeper excavation in such locations shall be rectified by backfilling with approved sand and/or graded gravel, and shall be compacted to provide a firm and unyielding subgrade and/or foundation, as directed by the Engineer, all at the expense of the Contractor.

F. Trenching By Hand Or Machine

Hand methods for excavation shall be employed in locations shown on the drawings. In other locations, the Contractor may use trench digging machinery or employ hand methods.

G. Structure Protection

Temporary supports, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall

be furnished by the Contractor at his expense and under the direction of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

H. Protection Of Property And Surface Structures

Trees, shrubbery, fences, poles and all other property and surfaces structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer. When it is necessary to cut roots and tree branches, such cutting shall be done under the supervision and direction of the Engineer. Any structure that has been disturbed shall be restored upon completion of the work.

I. Bracing Excavations

All excavations shall be properly supported in the manner as required by OSHA Federal Resister Vol. 37, No. 243, Sub-part P, Section 1926.652 or as required by state laws and municipal ordinances and as may be necessary to protect life, property, the work or as ordered by the Engineer. Excavations shall be so braced, sheeted and supported that they will be safe, and the ground alongside the excavation will not slide or settle, and all existing improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does results to such improvements of any kind, either on public or private property, will be fully protected from damage. If any damage does result to such improvements, at the Contractor, at his own expense, shall make the necessary repairs or reconstruction required as directed by the Engineer.

Excavations shall be so braced or sheeted so as to provide conditions under which workmen may work safely and efficiently at all times. The sheeting, shoring and bracing shall be so arranged as not to place any stress on portions of the completed work until the general construction thereof has proceeded far enough to provide ample strength. Any damage to structures occurring through settlements, water or earth pressures, slides, caves of other causes due to failure or lack of sheeting or bracing or improper bracing or through negligence or fault of the Contractor in any other manner shall be repaired by the Contractor at his own expense.

J. Dewatering (If Necessary)

The Contractor shall provide and maintain, at all times during construction, ample means and devices with which to promptly remove and properly dispose of all water from any source entering the excavations or other parts of the work. Dewatering shall be accomplished by methods which will ensure a dry excavation and preservation of the final lines and grades of the bottoms of excavations. Said methods may include well points, sump pumps, suitable rock or gravel placed below the required bedding for drainage and pumping purposes, temporary pipelines and other means, all subject to the approval of the Engineer. All dewatering as described herein shall be accomplished by and at the sole expense of the Contractor.

Dewatering for the structures and pipelines shall commence when ground water is first encountered and shall be continuous until such time as water can be allowed to rise in accordance with the provisions of this water be allowed to rise over them until the concrete or mortar has set at least eight hours. Water shall not be allowed to rise unequally against walls for a period of 28 days.

The Contractor shall dispose of the water from the work in a suitable manner without damage to adjacent property. No water shall be drained into work built or under construction without prior consent of the Engineer. Water shall be disposed in such a manner as not to be a menace to the public health.

K. Pipe Foundation And/Or Subgrade

1. Trench Bottom For Pipe

The trench bottom shall be graded to provide a smooth, firm and stable foundation at every point throughout the length of the pipe. Should large gravel and cobbles be encountered at the trench bottom or pipe subgrade, they shall be removed from beneath the pipe and replaced with clean imported sand which shall be compacted to provide uniform support and a firm foundation, all at the Contractor's expense.

2. Foundations In Poor Soil

If excessively wet, soft, spongy, unstable or similarly unsuitable material is encountered at the surface upon which the bedding material is to be placed, the unsuitable material shall be removed to a depth as determined in the field by the Engineer. Removal of material and additional bedding so ordered over and above the amount required by the "bedding details", will be paid for under the General provisions, unless, however, the necessity for such additional bedding material has been occasioned by an act or failure to act on the part of the Contractor, in which event the Contractor shall bear the expense of the additional excavation and backfill to the required depth. The Contractor's attention is called to section 02310.B.10 regarding his responsibilities in maintaining adequate dewatering procedures to ensure that an otherwise stable foundation will not be rendered unfit due to accumulation of water in the trench excavation.

3. Foundation In Rock

Where rock is encountered, it shall be removed below grade and the trench backfilled with clean imported sand to provide a compacted foundation cushion with a minimum allowable thickness of 6-inches under the outside diameter of the pipe bell. Removal of rock and additional imported sand bedding over and above sand bedding required by the detail specifications shall be included in the bid item for which the work relates, or as specifically provided for in the schedule of bid items.

4. Pipe Clearance In Rocks

Ledge rock, boulders, and large stones shall be removed to provide a clearance of at least 6-inches below and on each side of the pipe and fittings for pipes 24-inch in diameter or less, and 9-inch for pipes larger than 24-inches in diameter. The specified minimum clearances are the minimum clear distances that will be permitted between any part of the pipe and appurtenances being laid and any part, projection, or point of such work, boulder or stone.

L. Blasting

Not used.

M. Trench Backfill

All trenches shall be backfilled after pipe, fittings and appurtenances have been installed, inspected and approved by the Engineer. Whenever a relative compaction requirement value is specified herein, the optimum moisture content and relative density shall be determined in accordance with Standard Proctor Density AASHTO T-99 or ASTM D-698.

All wood and waste material shall be removed from excavation prior to backfilling. Backfill material shall be approved in all cases by the Engineer and shall be free of trash, wood, large rock or other objectionable debris. Backfilling shall include the refilling and compacting of the fill in trenches of excavations up to the subgrade of the street or to the existing ground surface.

1. Procedure At Pipe Zone

Selected backfill material consisting of loose earth or sand free from stones, clods, or other deleterious material shall be placed in the trench simultaneously on each side of the pipe for the full width of the trench in layers of about 6-inches in depth. Each layer shall be thoroughly compacted to a Standard Proctor of 95% or, where the material is sufficiently granular in nature as approved by the Engineer, by water settling. Particular attention is to be given to the underside of the pipe and fittings to provide a firm bedding support along the full length of the pipe. Care shall be exercised in backfilling to avoid damage to the pipe. The "pipe zone" shall be considered to extend 12-inches above the top of the outside diameter of the pipe bell.

2. Pipe Bedding - General

The pipe shall be carefully bedded as shown in the bedding detail on the plans. The Contractor shall be responsible for accurately shaping the pipe subgrade to fit the bottom of the pipe for the width shown on the "embedding details". Use of a drag template shaped to conform to the outer surface of the pipe will be required if other methods do not give satisfactory results.

Each joint shall be recessed in undisturbed soil or bedding material as required by the bedding detail in such a manner as to relieve the bell of the pipe of all load and to ensure continuous bearing along the pipe barrel upon the pipe subgrade.

The pipe bedding, using either selected material, clean imported sand or crushed rock or gravel, shall be compacted by approved methods to Standard Proctor of 95%. When the bedding material is selected material or imported sand, the pipe bedding backfill shall be brought to optimum moisture content and shall be placed by hand in layers not exceeding 3-inches in thickness to the centerline (springline) of the pipe and each layer shall be solidly tamped with the proper tools so as not to injure, damage or disturb the pipe. Backfilling shall be carried on simultaneously on each side of the pipe to assure proper protection of the pipe. Water settling for compaction may be approved by the Engineer in the event the

foundation and bedding materials are sufficiently granular and sandy in nature that the required compaction will be obtained.

3. Pipe Bedding - Sand For Pipe Bedding

Where the trench excavation and pipe foundation and/or subgrade consist of granular soil, the pipe may be bedded in the material found in the trench as herein after provided. Clean imported sand shall be used when specified on the drawings or when the trench excavation material and pipe foundation is not granular soil which is suitable for adequate bedding. In all cases, the material to be used for pipe bedding shall be subject to the approval of Engineer.

4. Procedure Above Piped Zone

The remaining portion of the trench to within 2-1/2 feet of the finished roadway surface or ground surface, as the case may be, shall be backfilled, compacted and/or consolidated by approved methods to obtain a Standard Proctor of 95%. Backfilling shall be done with good sound earth, sand or gravel, and no oil cake, bituminous pavement, concrete, rock or other lumpy material shall be used in the backfill unless these materials are scattered and do not exceed 6-inches in any dimension and are not placed within 1-foot of the 2-1/2 foot limit. Material of perishable, spongy or otherwise, improper nature shall not be used in backfilling, and no material greater than 4-inches in any dimension shall be placed within 1-foot of any pipe, manhole or structure.

5. Compacted Fill

Compaction shall be done by use of vibratory equipment, tamping rollers, pneumatic tire rollers or other mechanical tampers of the type and size approved by the Engineer. The backfill shall be placed in horizontal layers of such depths as are considered proper for the type of compacting equipment being used in relation to the backfill material being placed. Each layer shall be evenly spread, properly moistened and compacted to the specified relative density in Section 02310.B.13. Any damage to the pipe as a result of Contractor's operation shall be repaired and/or replaced at the Contractor's expense.

6. Procedure At Grade

The top 2-1/2 feet from finish street grade or ground surface, as the case may be, shall be compacted in horizontal layers not exceeding 8-inches in thickness, using approved hand pneumatic or mechanical type tampers to obtain a Standard Proctor of 95%. Flooding and jetting will be permitted in this upper 2-1/2 feet. From existing street grade to 2-1/2 feet below street grade, at the material for backfill may contain stones ranging in inches up to 2-inches in diameter; in quantity not exceeding 20% of the volume where said coarse materials are well distributed throughout the finer material and the specified compaction can be obtained. County specifications shall be used within county right-of-way.

6. Compaction Test

The Contractor will engage the services of a testing laboratory to test the degree of compaction attained in the backfill. Compaction shall be tested in accordance with the methods specified by the Engineer. The Contractor will pay for the initial cost of all compaction tests. If the backfill compaction fails to meet the density requirements set forth herein, the Contractor shall pay for subsequent compaction tests at the current rate for each individual test.

The Contractor shall make all necessary excavations for compaction tests as directed by the Engineer and all work in connection with compaction testing by the Contractor shall be included in the various contract bid prices and no additional allowance will be made therefor.

Compaction tests shall be performed for the pipe trenches and subgrades; and shall be in conformance with the governing standards as specified in the Contract Documents and Specifications

Compaction tests shall be performed at all water services, valve boxes, structures, fire hydrants, etc. and at 200-foot intervals at (1) pipe zone, (2) each 2 feet of fill and (3) at top of trench, as a minimum or as specified by the Engineer.

Manhole and Structure Backfill – The Contractor shall give special emphasis to the backfill around all appurtenances, water services, valves, and structures. The backfill shall be placed in horizontal layers not exceeding 12-inches in depth and shall be adequately moistened and thoroughly tamped with air or vibrator plate or jumping jack compactor. Emphasis will also be placed on amount of density testing as directed by Engineer.

Settlement – The Contractor will be responsible for repairing or complete replacement of any deterioration or settlement of the pipe trenches and associated street surfaces. Notification of the required repairs will be issued by the Owner's Representative. All costs of repairs and all liability, as a result of surface deterioration or settlement, shall be the responsibility of the Contractor. The Warranty Period shall be extended for the full period for the entire Project to cover future settlement deterioration until the Project as a whole shows no signs of settlement deterioration.

3.03 EXCESS EXCAVATED MATERIAL

The Contractor shall make the necessary arrangements for, and shall remove and dispose of all excess excavated material. All costs for the disposal of excess waste material shall be borne by the Contractor.

It is the intent of these specifications that all surplus material not required for backfill or fill shall be disposed of by the Contractor outside the limits of the public right-of-way and/or easements at no cost or liability to the Owner.

No excavated material shall be deposited on private property unless written permission from the owner thereof is secured by the Contractor. Before the Owner will accept the work as being completed, the Contractor shall file a written release signed by all property owners with whom he has entered into agreements for disposal of excess excavated material absolving the Owner from any liability connected therewith.

3.04 IMPORTED BACKFILL MATERIAL

Whenever the excavated material is not suitable for backfill, the Contractor shall arrange for and furnish suitable imported backfill material which is capable of attaining the required relative density as this own expense. He shall dispose of the excess trench excavation as specified in the preceding section. The backfilling with imported material shall be done in accordance with methods described herein.

3.05 FINAL CLEAN-UP

After backfill has been completed, the right-of-way shall be dressed smooth and left in a neat and presentable condition to the satisfaction of the Engineer.

3.06 RESTORATION OF DAMAGED SURFACES AND PROPERTY

If any pavement, trees, shrubbery, fences, poles or other property and surface structures have been damaged, removed or disturbed by the Contractor, whether deliberately or through failure to carry out the requirement of the contract documents, state laws, municipal ordinances or the specific direction of the Engineer or through failure to employ usual and reasonable safeguards, such property and surface structures shall be replaced or repaired at the expense of the Contractor.

END OF SECTION

SECTION 02550
VALVES

PART 1.0 – GENERAL

1.01 Work Included

The Contractor shall furnish all material, equipment, tools and labor necessary to accomplish the work specified herein and shown on the Contract Drawings. The valves body shall have the same pressure rating as the pipe that it is connected to.

1.02 Related Sections

A. General Conditions and Division 1
B. Section 02200 – Earthwork
C. Section 18110 – Pipe and Pipe Fittings

1.03 Quality Standards

Ensure valves contained in this and referenced sections are produced in full compliance with specified items and any references to codes and standards. Abbreviated forms of more commonly referenced standards are as follows:

A. AGMA - American Gear Manufacturers Association
B. ANSI - American National Standards Institute
C. ASTM - American Society for Testing and Materials
D. AWWA - American Water Works Association
E. MSS - Manufacturers Standardization Society of the Valve and Fittings Industry

PART 2.0 – MATERIALS

2.01 General

A. Valve Components

1. All valves shall have the manufacturer and size of the valve visibly cast on the body or on a plate attached to the body of the valve.

2. Valves and required operating appurtenances shall be the product of the same manufacturer.

3. Valve components shall withstand the environmental conditions in contact and provide continuous trouble-free service.

4. Valve seals shall be able to provide tight closure and prevent metal-to-metal contact.

B. Materials

1. Brass and bronze components of valves and appurtenances in contact with water and brass

or bronze used in any part of a valve in buried or submerged service shall be alloys containing less than 16 percent zinc and 2 percent aluminum.

2. Acceptable alloys are of the following ASTM designations: B 61, B 62, B 98 (Alloy A,B, or D), B 139 (Alloy A), B 143 (Alloy 1-B), B 164, B 194, B 292 (Alloy A), and B 127.

3. Stainless steel Alloy 18-8 may be substituted for bronze at the option of the manufacturer with the acceptance of the Engineer.

C. Ends and Trim

Not Used

D. Operators

1. Valve operators shall open by turning counter-clockwise (left) unless otherwise noted.

2. All below ground valves shall be provided with a 2" operating nut. Valves in excess of 6'-0" bury depth shall have operator extensions with centering spiders. Operator extensions shall be mechanically fastened to operating nut.

E. Protective Coatings

All valves servicing potable water systems shall have fusion bonded epoxy linings in accordance with AWWA C213. Stainless steel, PVC, bronze and resilient lined valves are excluded.

2.02 Gate Valves

A. General

All gate valves shall conform to AWWA C509 “Resilient-Seated Gate Valves for Water Supply Service”. The additional requirements and exceptions to the AWWA standards contained herein shall also be applicable. NSF approval of gate valves is not required.

B. Service Conditions

All valves shall be suitable for throttling service and/or frequent operation as well as service involving long periods of inactivity. The operating pressure for all sizes shall be 150 p.s.i. gage.

2.03 Gate Valve Requirements

Acceptable manufacturers include Clow, Kennedy, M&H, or approved equal.

A. Mechanical Joints

All components of this type of joint shall conform to ANSI 21.11 (AWWA Standard C111, "Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings"). The bolts and hexagon nuts shall be fabricated from a high-strength, low alloy steel conforming to ASTM A 242 and known

in the industry as "Cor-Ten" or "Usalloy".

Accessories for the mechanical joint consisting of the gasket, gland and fasteners shall be furnished and packaged separately from the valves. Each package shall be labeled in such a manner as to provide for proper identification and number of units per package or bundle.

B. Bolting Material

Bolts and hex nuts used on the valve shall be the manufacturer's standard, either fabricated from a low-alloy steel for corrosion resistance or electroplated with zinc or cadmium. The hot-dip process in accordance with ASTM Standard Designation A-153 is not acceptable for the threaded portions of the bolts and nuts.

C. Valve Stems

The maximum input torque required to fully open or close the valve for Class 150B conditions shall not exceed 150 foot-pounds when applied to the operating nut.

D. Affidavit of Compliance

The manufacturer of valves supplied under this Specification shall furnish to the Engineer, an affidavit of compliance in accordance with all applicable provisions of AWWA C504 and AWWA C500 as modified or supplemented herein.

2.04 Eccentric Plug Valves

A. Acceptable Manufacturers:

1. DeZurik Corporation.
2. Pratt Valves.
3. Or approved equal.

B. Plug valves shall be quarter-turn non-lubricated eccentric type with resilient faced plug. Alternate seat and plug materials may be considered provided this specification is met and, in addition, the manufacturer must prove prior to approval that the valve meets AWWA C517 "proof of design tests" (10,000 cycles) in both directions. Flanged valve ends shall be faced and drilled to conform to ANSI B16.1, Class 150 for diameter and drilling. Mechanical or push-on type rubber-gasketed joint ends shall conform to AWWA C111. Port areas for valves smaller than 20-inch shall be at least 80 percent of full pipe area. Port areas for valves 24-inch and larger shall be at least 70 percent of full pipe area.

C. Materials and Construction:

1. Bodies shall be of ASTM A126, Class B cast iron.

2. Valve plug shall be ASTM A126, Class B cast iron or ASTM A536 ductile iron. Resilient plug facing shall be synthetic rubber, neoprene or Buna N compound suitable for use with water and wastewater applications.

3. Seats shall be a raised welded overlay of 90% pure nickel, a minimum of .125" thick and 0.50" wide, conforming to AWWA C517. When the plug is in the closed position, the resilient plug facing shall contact only nickel. Sprayed or plated mating seat surfaces are not acceptable for resilient plugs.

4. Bearings shall be replaceable. Sleeve bearings in the upper and lower journals shall be permanently lubricated 316 stainless steel per ASTM A743 Grade CF-8M. Nonmetallic journal bearings shall not be acceptable. Thrust bearings shall be teflon.

5. Shaft seals shall be self-adjusting chevron-type conforming to AWWA C517. Valve shall be designed so it can be repacked while the valve is in line and under pressure without removing the actuator. O-ring seals shall not be acceptable in valves larger than 3".

6. All exposed fastening hardware shall be zinc plated or stainless steel. Provide stainless steel bolting on buried service valves.

D. Manual Operators:

1. All valves shall open counterclockwise.

2. Provide indicators to show position of plug except on buried operators.

3. Actuators: Manual valves shall have lever or worm gear actuators with handwheels, chainwheels, tee wrenches, extension stems, floorstands, etc., as shown on the plans or as called for in the valve schedule. Lever actuators shall be furnished for valves 8" or smaller where the maximum shutoff pressure is 25 psi or less as indicated on the plans or in the valve schedule. Worm gear actuators shall be furnished for all valves 4" or larger where the maximum reverse shutoff pressure is greater than 25 psi. Worm gear actuators shall be sized for 150 psi. All gearing shall be enclosed in a semi-steel housing and be suitable for running in a lubricant with seals provided on all shafts to prevent entry of dirt and water into the actuator. The actuator shaft and the quadrant shall be supported on permanently lubricated bronze bearings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. This adjustable stop shall be the only adjustment necessary to set the clearance between the valve plug and the seat while the valve is in line and under pressure. Handwheel and chainwheel sizes for worm gear actuators shall be no smaller than 6" in diameter and no larger than twice the diameter of the actuator's gear sector. All exposed nuts, bolts, and washers shall be zinc plated.

4. Valves and gear actuators for buried or submerged service shall have seals on all shafts and gaskets on the valve and actuator covers to prevent the entry of water. Actuator mounting brackets for buried or submerged service shall be totally enclosed and shall have gasket seals. All exposed nuts, bolts, springs, and washers shall be stainless steel.

5. Handwheels shall be located for easy access on exposed valves.

6. Buried valves shall be operated by a 2" AWWA nut with valve box.

2.05 Check Valves

A. Acceptable Manufacturers: VAL-MATIC, PRATT, OR APPROVED EQUAL.

B. Check valves shall be Val-Matic Surgebuster swing check valve or approved equal.

C. Check Valve to be AWWA C508 Certified.

PART 3.0 – EXECUTION

3.01 Setting of Valves and Fittings

A. General Requirements

Valves, fittings, plugs, and caps shall be joined to pipe in the manner specified herein for cleaning, laying and joining pipe.

B. Mechanical Joint Connections

All buried piping connections shall be restrained mechanical joint connections. All mechanical joints shall conform to ANSI/AWWA C111/A21.11.

1. Mechanical joints shall be carefully assembled in accordance with the manufacturer's recommendations. If effective sealing is not obtained, the joint shall be disassembled, thoroughly cleaned, and reassembled. Bolts shall be uniformly tightened to the torque values listed in Appendix A of ANSI/AWWA C111/A21.11. Over-tightening of bolts to compensate for poor installation practice will not be permitted.

2. The holes for mechanical joint tie rods shall be carefully aligned to permit installation of the tie rods. In flange and mechanical joint pieces, holes in the mechanical joint bells and the flanges shall straddle the top (or side for vertical piping) center line. The top (or side) center line shall be marked on each flange and mechanical joint piece at the foundry.

3. The restraint shall use a series of individually actuated gripping wedges to positively engage the pipe surface while allowing joint deflection both before and after the installation. The wedging action shall provide high pressure restraint capability for mechanical joint fittings, valves, hydrants, and pipe, rated at 100 PSI. All sizes shall be tested to a minimum of 2:1 safety factor.

4. Approved restraints include "Megalug" by EBAA Iron Sales Inc.

C. Location of Valves and Valve Markers

Valves on water mains shall, where possible, be located on the street property lines extended unless shown otherwise on the plans.

3.02 Pressure Tests

A. Valves shall be tested at the same time that the adjacent pipeline is tested.

B. If there are any special parts of control system or operators that might be damaged by the pipeline test, they shall be properly protected. The Contractor will be held responsible for any damage caused by the testing.

C. Joints shall show no visible leakage under test. Repair joints that show signs of leakage prior to final acceptance.

END OF SECTION

SECTION 02671
PRESSURE TESTING

PART 1.0 - GENERAL

1.01 WORK INCLUDED

The work to be performed includes the pressure testing of pipes. This work shall be performed after disinfection of the pipeline.

PART 2.0 - MATERIALS (NOT USED)

PART 3.0 - EXECUTION

3.01 GENERAL

Pressure testing of all pipelines shall be performed in accordance with the Owner's standards.

3.02 TESTING OF PRESSURE PIPE

All pipe shall be field pressure tested to the design pressure specified for each pipe.

The Engineer shall be notified 24 hours in advance of testing. All testing shall be made in the presence of the Engineer or Owner's representative.

The Contractor will furnish the calibrated meter and the pump for testing. The pipeline shall be in a state of readiness for testing; all bulkheads, pumps, taps and appurtenances necessary to fill the pipeline and maintain the required pressure shall be in place. The pipeline shall be filled with water and the test pressure of 150 psi applied to the pipeline by means of a pump, equipped with a suitable pressure regulator. When filling the pipeline, it shall be filled at a rate which will not cause any surges nor will it exceed the rate at which the air can be released.

All air in the line shall be properly purged. Where blow-offs or hydrants are not available or effective in purging air from the line, the Contractor will install a tap to purge the line. The location and size of tap shall be at the Engineer's discretion.

While the test pressure is maintained, the pipe will be examined for any leaks. Any pipe or fitting found to be cracked shall be removed and replaced. Cutting and replacing of pavement, excavating and backfilling are a necessary part of locating and repairing leaks discovered by pressure testing of pipe.

After all visible leaks have been stopped; the full test pressure shall be maintained for 24 continuous hours.

END OF SECTION

SECTION 03300
CAST IN PLACE CONCRETE

PART 1.0 – GENERAL

1.01 SUMMARY

A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. See Division 2, Section "Structural Excavation."

1.02 QUALITY ASSURANCE

A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.

B. Comply with ACI 301, "Specification for Structural Concrete," and ACI 318 "Building Code Requirements for Structural Concrete"

C. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.

1. Formwork and form accessories.

2. Steel reinforcement and supports.

3. Concrete mixtures.

4. Handling, placing, and constructing concrete.

PART 2.0 – MATERIALS AND EQUIPMENT

2.01 MATERIALS

A. Formwork: Furnish formwork and form accessories according to ACI 301.

B. Steel Reinforcement

1. Reinforcing Bars: ASTM A 615, Grade 60, deformed.

C. Concrete Materials

1. Portland Cement: ASTM C 150, Type I/II.

2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding ¾-inch nominal size.

3. Water: Complying with ASTM C 94.

D. Admixtures

1. Air-Entraining Admixture: ASTM C 260.

2. Water-Reducing Admixture: ASTM C 494, Type A.

3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.

4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.

5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.

6. Cement material may be replaced by up to 20% by weight of fly ash.

E. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

F. Curing Materials

1. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

2. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf.

3. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

4. Water: Potable.

5. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.

G. Kryptonite Swelling Water Stop (or Engineer Approved Equal)

1. Rubber or polyvinyl chloride expanding water stops shall be placed in joints of structures as shown on the drawings. (4-inch minimum width)

2. Shall be resistant to high hydrostatic pressure and suitable for use in sewage and containment structures.

3. The Contractor shall fabricate all special intersections, splices and joints, and make bends at corners as shown on the drawings or as directed by the Engineer. All joints, splices, bends and intersections shall be made in strict accordance with the

manufacturer's printed instructions; using materials approved by the manufacturer, and shall be formed to produce a strong, sound and watertight joint.

4. The Contractor shall take suitable precautions to support and protect the expanding water stops during the progress of the work.

2.02 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test databases, as follows:

1. Compressive Strength (28 Days): 4000 psi. Field test databases shall be accompanied by calculations for standard deviation and based on test results from within 12 months.

2. Slump: 4-inches ± 1-inch.

3. Maxiumum Water Cement Ratio: .46

C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 6.0-percent within a tolerance of plus 1.0 or minus 1.0-percent.

D. Grout or Dry Pack

1. Grout shall be composed of Portland Cement, sand, and water proportioned and mixed as specified in this section. Grout shall be furnished and placed in recesses and holes, on surfaces, under structural members, and at other locations specified in these specifications, the special provisions or shown on the plans.

2. The proportion of cement to sand, measured by volume, shall be one to two unless otherwise specified.

2.03 CONCRETE MIXING

A. Ready-Mixed Concrete: Comply with ASTM C 94.

1. When air temperature is between 85- and 90-deg F, reduce mixing and delivery time from 1½-hours to 75-minutes; when air temperature is above 90-deg F, reduce mixing and delivery time to 60-minutes.

B. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3.0 – EXECUTION

3.01 INSTALLATION, GENERAL

A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301. Forms shall conform to the shape, lines and dimensions of the members as called for on the plans, and shall be substantial and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape. The material to be used and the design of the forms shall be subject to acceptance by the Engineer before construction of forms is started. However, such approval will not relieve the Contractor of responsibility for the adequacy of the forms not from the necessity for remedying any defects, which may develop or become apparent with use.

B. Removal of Forms & Shoring: Forms and shores shall not be removed until the concrete has achieved 80% of its strength and cured seven days. When the forms are stripped, there shall be no excessive deflection or distortion and no evidence of damage to the concrete, due either to removal of support or the stripping operation.

C. Steel Reinforcement: Comply with CRSI's “Manual of Standard Practice” for fabricating, placing, and supporting reinforcement.

D. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.

1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by Engineer.

E. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

3.02 CONCRETE PLACEMENT

A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.

B. Do not add water to concrete during delivery, at Project site, or during placement.

C. Consolidate concrete with mechanical vibrating equipment.

3.03 FINISHING FORMED SURFACES

A. Smooth-Formed Finish: When forms are removed, repair and patch tie holes and defective areas. Completely remove fins and other projections.

1. This finish applies to all formed concrete surfaces whether exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing or dampproofing.

B. Trowel Finish (bottom slab): Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view.

C. Nonslip Broom Finish (top slab): Apply a nonslip broom finish to surfaces indicated and to exterior concrete sidewalks, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.04 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.

D. Cure formed and unformed concrete for at least seven days as follows:

1. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three (3) hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: The Owner will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301. The Owner will pay for this testing.

B. Testing Frequency: One composite sample for each day's pour of each concrete mix exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof. Each sample shall consist of 6 standard cylinders.

C. Test 2 cylinders at 7 days and 3 cylinders at 28 days. Hold remaining cylinder for later testing if required.

END OF SECTION

SECTION 03410
PRECAST STRUCTURAL CONCRETE

PART 1.0 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Precast structural concrete.
2. Precast structural concrete with commercial architechtural finish.

B. All manholes and vaults will require a coating of Tnemec Series 46-465 or approved equal.

1.02 PERFORMANCE REQUIREMENTS

A. Delegated Design: Design precast structural concrete, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

B. Structural Performance: Precast structural concrete units and connections shall withstand design loads indicated within limits and under conditions indicated.

1.03 QUALITY ASSURANCE

A. Fabricator Qualifications: A firm that assumes responsibility for engineering precast structural concrete units to comply with performance requirements. Responsibiloty includes preparation of Shop Drawings and comprehensive engineering analysis by a qualified professional engineer.

B. Testing Agency Qualifications: Qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

C. Design Standards: Conply with ACI 318-11 and design recommendations in PCI MNL 120, “PCL Design Handbook – Precast and Prestressed Concrete,” applicable to types of precast structural concrete units indicated.

D. Quality-Control Standard: For manufacturing procedures and testing requirements, quality-control recommendations, and dimensional tolerances for types of units required, comply with PCI MNL 116, “Manual for Quality for Plants and Production of Structural Precast Concrete Products.”

E. Welding Qualifications: Quality procedures and personnel according to the following:

1. AWS D1.1:201, “Structural Welding Code – Steel.”
2. AWS D1.4, “Structural Welding Code – Reinforcing Steel.”

PART 2.0 - PRODUCTS

2.01 MANUFACTURERS

A. Fabricators: Subject to compliance with requirements

2.02 MOLD MATERIALS

A. Molds: Rigid, dimensionally stable, non-absortive material, warp and buckle free, that will provide continuous and true precast concrete surfaces within fabrication tolerances indicated; nonreactive with concrete and suitable for producing required finishes.

   1. Mold-Release Agent: Commercially produced liquid-release agent that will not bond with, stain or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments of precast concrete.

B. Form Liners: Units of face design, texture, arrangement, and configuration indicated. Furnish with manufacturer's recommended liquid-release agent that will not bond with, stain, or adversely affect precast concrete surfaces and will not impair subsequent surface or joint treatments or precast concrete.

C. Surface Retarder: Chemical set retarder, capable of temporarilty delaying final hardening of newly placed concrete mixture to depth of reveal secified.

2.03 REINFORCING MATERIALS

A. Reinforcing Bars: ACI 318-11, Grade 50, deformed.

B. Steel Bar Mats: ASTM A 184/A 184M, fabricated from ASTM 615/A 615M, Grade 60 deformed bars, assembled with clips.

C. Plain-Steel Welded Wire Reinforcement: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.

D. Supports: Suspend reinforcement from back of mold or use bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place according to PCI MNL 116.

2.04 CONCRETE MATERIALS

A. Portland Cement: ASTM C 150, Type I or Type III, gray, unless otherwise indicated.

B. Supplementary Cementitious materials:

1. Fly Ash: ASTM C 618, Class C or F, with maximum loss on ignition of 3 percent.
2. Metakaolin Admixture: ASTM C 618, Class N.
3. Silica Fume Admixture: ASTM C 1240, with optional chemical and physical requirement.
4. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

C. Normal-Weight Aggregates: Except as modified by PCI MNL 116, ASTM C 33, with coarse aggreagtes complying with Class 5S. Stockpile fine and coarse aggregates for each type of exposed finish from a single source (pit or quarry) for the Project.

1. Face-Mixture- Coarse Aggregates: Selected, hard, and durable; free or material that reacts with cement or causes staining; to match selected finish sample. Aggregate shall not exceed ¾" diameter.

a. Gradation: Uniformly graded

2. Face-Mixture-Fine Aggregates: Selected, natural or manufactured sand of same material as coarse aggregate unless otherwise approved by Architect.

D. Water: Potable; free from deleterious material that may affect color stabilioty, setting, or strength of concrete and complying with chemical limits of PCI MNL 116.

E. Air-Entraining Admixture: ASTM C260, certified by manufacturer to be compatible with other required admixtures.

F. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures and to not contain calcium chloride, or more than 0.15 percent chloride ions or other salts by weight of admixture.

1. Water-Reducing Admixtures: ASTM C 494/C 494M, Type A.
2. Retarding Admixture: ASTM C 494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C 494/C494M, Type D.
4. Water-Reducing and Accelerating Admixture: ASTM C 494/C494M, Type E.
5. High-Range, Water-Reducing Admixture: ASTM C 494/C494M, Type F.
6. High-Range, Water Reducing and Retarding Admixture: ASTM C 494/C494M, Type G.
7. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M.

G. Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable or forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.05 STEEL CONNECTION MATERIALS

A. Carbon-Steel Shapes and Plates: ASTM A 36/A 36M.

B. Carbon-Steel-Headed Studs: ASTM A 108, AISI 1018 through AISI 1020, cold finished AWS D1.1/D1.1M, Type A or B, with arc shields and with minimum mechanical properties of PCI

MNL 116.

C. Carbon-Steel Plate: ASTM A 283/A283M.

D. Malleable-Iron Castings: ASTM A 47/A 47M.

E. Carbon-Steel Castings: ASTM A 27/A 27M, Grade 60-30.

F. High-Strength, Low-Alloy Structural Steel: ASTM A 572/A 572M.

G. Carbon-Steel Structural Tubing: ASTM A 500, Grade B.

H. Wrought Carbon-Steel Bars: ASTM A 675/A 675M, Grade 65.

I. Deformed-Steel Wire or Bar Anchors: ASTM A 496 or ASTM A 706/A 706M.

J. Carbon-Steel Bolts and Studs: ASTM A 307, Grade A; carbon-steel, hex-head bolts and studs; corbon-steel nuts, ASTM A 563; and flat, un hardened steel washers, ATM F 844.

K. High-Strenght Bolts and Nuts: ASTM A 325 or ASTM A 490, Type 1, heavy hex steel structural bolts; heavy hex carbon-steel nuts, ASTM A 563; and hardened carbon-steel washers, ASTM F 436.

    1. Do not zinc coat ASTM A 490 bolts.

L. Zinc-Coated Finish: For exterior steel items, steel in exterior walls, and items indicated for galvanizing, apply zinc coating by hot-dip process according to ASTM A 132/A 132M or ASTM A 153/A 153M electrodeposition according to ASTM B 633, SC 3, Types 1 and 2.

    1. For Steel shapes, plates, and tubing to be galvanized, limit silicon content of steel to less than 0.03 percent or to between 0.15 and 0.25 percent or limit sum of silicon and 2.5 times phopphorus content to 0.09 percent.
    2. Galvanizing Repair Paint: High-zinc-dust-content paint with dry film containing not less than 94 percent zinc dust by weight, and complying with DOD-P-21035B or SSPC-Paint 20.

M. Shop Primed Finish: Prepare surfaces of nongalvanized-steel items, except those surfaces to be embedded in concrete, according to requirements in SSPC-SP 3, and shop apply lead- and chromate-free, rust-inhibitive primer, complying with performance requirements in MPI 79 SSPC-Paint 25 according to SSPC-PA 1.

N. Welding Electrodes: Comply with AWS standards.

O. Precast Accessories: Provide clips, hangers, plastic or steel shims, and other accessories required to install precast structural concrete units.

2.06 STAINLESS-STEEL CONNECTION MATERIALS

A. Stainless-Steel Plate: ASTM A 666, Type 304, of grade suitable for application.

B. Stainless-Steel Bolts and Studs: ASTM F 593, Alloy 304 or 316, hex-head bolts and studs; stainless-steel nuts; and flat, stainless-steel washers. Lubricate threaded parts of stainless-steel bolts with and antiseize thread lubricant during assembly.

C. Stainless-Steel-Headed Studs: ASTM A 276, with minimum mechanicl properties of PCI MNL 116.

2.07 GROUT MATERIALS

A. Sand-Cement Grout: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144 or ASTM C 404. Mix at ratio of 1 part cement to 2-1/2 parts sand, by volume, with minimum water required for placement and hydration.

B. Nonmetallic, Nonshrink Grout: Premixed, nonmetallic, noncorrosive, nonstaining grout containing selected silica sands, Portland cement, shrinkage-compensating agents, plasticizing and water-reducing agents, complying with ASTM C 1107, Grade A for drypack and Grades B and C for flowable grout and of consistency suitable for application within a 30-minute working time.

C. Epoxy-Resin Grout: Two-component, mineral-filles epoxy resin; ASTM C 881/C 881M, or type, grade, and class to suit requirements.

D. Sand-Cement Mortar: Portland cement, ASTM C 150, Type I, and clean, natural sand, ASTM C 144. Mix at ratio of 1 part cement to 4 parts sand, by volume, with minimum water required for placement.

2.08 CONCRETE MIXTURES

A. Prepare design mixtrues for each type of precast concrete required.

1. Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of Portland cement, which would otherwise be used, by not less than 40 percent.
2. Limit use of fly ash to 25 percent replacement of Portland cement by weight and granulated blast-furnace slag to 40 percent of Portland cement by weight; metakaolin and silica fume to 10 percent of portland cement by weight.

B. Normal-Weight Concrete Mixtures: Proportion face mixtures by either laboratory trial bath or field test data methods according to ACI 211.1, with materials to be used on the Project, to provide normal-weight concrete with the following properties:

1. Compressive Strength (28 Days): 4,000 psi.
2. Maximum Water-Cementitious Materials Ratio: 0.52

2.09 FABRICATION

A. Cast-in Anchors, Inserts, Plates, Angles, and Other Anchorage Hardware: Fabricate anchorage hardware with sufficient anchorage and embedment to comply with design requirements. Accurately position for attachment of loose hardware, and secure in place during precasting operations. Locate anchorage hardware where is does not affect position of main reinforcement or concrete placement.

B. Furnish loose hardware items including steel plates, clip angles, seat angles, anchors, dowels, cramps, hangers, and toher hardware shapes for securing precast structural concrete units to supporting and adjacent construction.

PART 3.0 - EXECUTION

3.01 EXAMINATION

A. Examine supporting structural frame or foundation and conditions for compliance wth requirements for installation tolerances, true and level bearing surfaces, and other conditions affecting performance of the Work.

END OF SECTION

SECTION 18110

PIPE AND PIPE FITTINGS

PART 1.0 - GENERAL

1.01 Summary

A. The purpose and intent of this Section are to require that all necessary piping and related material shall be furnished and installed to provide complete and workable piping systems.

B. Provide all pipe and fittings required to install all new piping systems specified in Division 18 and as indicated on the drawings.

C. This Section includes:

1. Forcemain Piping.
2. Gravity Sanitary Sewer Piping.
3. Yard Piping.
4. Water Line Piping.
5. Air Piping
6. All interior piping except for storm and sanitary drains, water supply piping, and plumbing.
7. All small piping such as cooling or sealing water connections, vents, drains, control tubing, lubricating tubing, etc., required to complete the installation of each piece of mechanical equipment.
8. Furnish and install piping connected to accessories which must vary from the drawings because of requirements peculiar to the particular equipment furnished, as required to make a complete and workable installation at no additional cost to the Owner. This requirement shall include changes required in the piping systems because of design changes made by the manufacturer between the time of design and the time of installation or because of equipment furnished of different manufacture than that specified.

1.02 References

A. Pipe and fittings shall be designed and tested in accordance with manufacturers' recommended procedures and the following codes and applicable standards:

1. American National Standards Institute (ANSI):

A312 - Seamless and Welded Austenitic Stainless Steel Pipe.
A403 - Wrought Austenitic Stainless Steel Piping Fittings.
A21.4 - Cement Mortar Lining for Cast-Iron Pipe and Fittings for Water.
A21.6 - Cast-Iron Pipe Centrifugally Cast in Metal Molds, for Water or Other Liquids
A21.8 - Cast-Iron Pipe Centrifugally Cast in Sand-Lined Molds, for Water or Other Liquids.
A21.10 - Gray-Iron and Ductile-Iron Fittings, 2 Inch Through 48 Inch, for Water and Other Liquids.
A21.11 - Rubber Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
A21.15 - Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
A21.51 - Ductile Iron Pipe, Centrifugally Cast, in Metal Molds or Sand-Lined Molds for Water or Other Liquids.
B16.1 - Cast-Iron Pipe Flanges and Flanged Fittings, 25, 125, 250 and 800 Pound
B16.3 - Malleable Iron Screwed Fittings, 150 and 300 Pound.
B16.5 - Steel Pipe Flanges and Flanged Fittings.
B16.9 - Factory-Made Wrought Steel Butt Welding Fittings.
B16.11 - Forged Steel Fittings, Socket Welding and Threaded.
B16.21 - Nonmetallic Gaskets for Pipe Flanges.
B16.22 - Wrought Copper and Bronze Solder Joint Pressure Fittings.
B16.25 - Butt Welding Ends.
B36.10 - Wrought-Steel and Wrought-Iron Pipe.

2. American Society for Testing and Materials (ASTM):

A53 - Welded and Seamless Carbon Steel Pipe.
A106 - Seamless Carbon Steel Pipe for High Temperature Service.
A120 - Black and Hot Dipped Zinc-Coated (Galvanized) Welded and Seamless Pipe for Ordinary Uses.
A182 - Forged and Rolled Alloy Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High Temperature Service.
A307 - Carbon Steel Externally and Internally Threaded Standard Fasteners.
A312 - Stainless and Welded Austenitic Stainless Steel Pipe.
A403 - Wrought Austenitic Stainless Steel Pipe Fittings.
A536 - Ductile Iron Castings.
A674 - Polyethylene Encasement for Gray and Ductile Cast-Iron Pipe for water or other Liquids.
A746 - Standard for Ductile Iron Gravity Service Pipe.
B75 - Seamless Copper Tube.
B88 - Seamless Copper Water Tube.
C150 - Portland Cement.
D1248 - Polyethylene Plastic Molding and Extrusion Materials.
D1784 - Rigid Polyvinyl Chloride Compounds and Chlorinated Polyvinyl Chloride Compounds.

D2310 - Machine Made Reinforced Thermosetting Resin Pipe.
D2997 - Centrifugally Cast Reinforced Thermosetting Resin Pipe.
D3034 - Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (4" through 15").
F679 - Type PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings (18" through 27").

3. American Water Works Association (AWWA):

C104 - Cement-mortar Lining for Cast-Iron and Ductile-Iron Pipe and Fittings for Water.
C105 - Polyethylene Encasement for Gray and Ductile Iron Piping for Water and Other Liquids.
C110 - Gray-Iron and Ductile-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids.
C111 - Rubber-Gasket Joints for Cast-Iron and Ductile-Iron Pressure Pipe and Fittings.
C115 - Flanged Cast-Iron and Ductile-Iron Pipe with Threaded Flanges.
C150 - Thickness Design of Ductile Iron Pipe.
C151 - Ductile Iron Pipe, Centrifugally Cast in Metal Molds or Sand-Lined Molds, for Water or Other Liquids.
C153 - Ductile Iron Compact Fittings.
C600 - Installation of Ductile Iron Pipe.
C900 - Polyvinyl Chloride Pressure Pipe.
C950 - Glass-Fiber-Reinforced Thermosetting-Resin Pressure Pipe.

4. American Society of Mechanical Engineers (ASME):

B31.1 - Code for Pressure Piping, Power Piping Section

ASME Boiler Code - Section 1.

5. National Bureau of Standards, Voluntary Products Standard (NBS):

PS15-69 - Custom Contact-Molded Reinforced-Polyester Chemical- Resistant Process Equipment.

1.03 Compliance Submittals

A. Submit the following for acceptance:

1. Color code for random length pipe shipped to job site.

2. Affidavits of compliance with applicable standards.

3. Test certificates.

4. Special fitting detail.

5. Joint details.

6. Butt welding end preparation details.

7. Test results or calculations for restrained joint assemblies.

B. Submit laying schedules with dimensioned plans or diagrams for all pipe 2 inches and larger.

1. Show pipe class, thickness, or schedule.

2. Show joint types for all pipe.

3. Show or schedule all accessories, including restraint fittings.

4. Furnish definitions for abbreviations with all submittals.

1.04 Delivery, Storage, and Handling

A. Ship all random-length pipe to the job site marked with a continuous color stripe indicating material and schedule number.

B. Handle all pipe and fittings in a manner to ensure that pipe and fittings will not be damaged.

C. Do not drop or bump pipe or fittings.

D. Use slings, lifting lugs, hooks or other devices designed to handle pipe.

E. Store pipe and fittings with provisions to prevent movement or slipping into adjacent units.

F. Ship all gaskets to the job site tagged with size, material and pressure rating.

G. Ship spare gaskets separately packaged and tagged as spare parts.

1.05 Job Conditions

A. Lines and grades shall be as indicated. Engineer will furnish a benchmark and a base line or other necessary horizontal control points to permit the Contractor to layout, stake, and construct the work.

PART 2.0 - PRODUCTS

2.01 Acceptable Manufacturers

A. Ductile-Iron Pipe:

1. American Ductile Iron Pipe

2. U.S. Pipe Supply.

3. Or approved equal.

B. Plastic Pressure and Gravity Pipe (PVC):

1. JM Eagle

2. Diamond Plastics.

3. Clow Corp.

4. Or approved equal.

2.02 Materials

A. Ductile Iron Pipe and Fittings:

1. Ductile iron pressure pipe shall conform to AWWA C115, C150, and C151 except as otherwise specified.

2. Minimum thickness class for flanged pipe, AWWA C115, shall be class 53.

3. Joints:

a. All buried gravity pipe shall have push-on joints conforming to AWWA C111, except where otherwise noted.

b. All interior and exposed exterior pipe shall be flanged unless otherwise indicated or specified.

1) Flanges shall match drilling and pressure class of connected valves, pumps, and other components. Contractor shall coordinate flange requirements with equipment supplied.

c. Pipe flanges shall be ductile iron, conforming to AWWA C115, except flange dimensions and drilling shall conform to ANSI B16.1 Class 250 where required to match supplied valves or equipment.

d. Sleeved or coupled joints shall be provided where indicated. Furnish pipe ends suitable for installing style of sleeve or coupling indicated or specified. Provide anchor couplings or thrust blocks where restraint is required to withstand specified operating or hydraulic test pressure and where indicated.

e. Flexible joints, where indicated on the drawings for buried piping, shall be one of the following:

1) Mechanical joint

2) Sleeve Coupling:

a) Dresser Style 38
b) JCM Model 201 or 210
c) Ford FCI
d) Smith-Blair 411
e) Romac Style 501

3) Sleeve couplings shall be cast iron, ductile iron, or fusion-bonded epoxy coated steel. Bolts shall be stainless steel.

f. Restrained flexible joints, where indicated on the drawings for buried piping, shall be one of the following:

1) Mechanical joint with rod-coupled gland and welded retainer ring.
2) Sleeve coupling with coupling glands, tie rods, and welded retainer rings.
3) Ball-joint pipe.
4) Mechanical joints with tie-rod assemblies to other fittings or wall pipes.
5) Tie-rods for restrained flexible joints shall be stainless steel.

4. Restrained Joints:

a. Furnish restrained joints, harnesses, anchors, or thrust blocks where called for on the drawings and at all locations where required to prevent separation of joints under operating and specified test hydraulic test pressures.

b. Proprietary restrained joints for push-on pipe shall be rated for the greater of 150 psi minimum working pressure and the specified hydraulic test pressure:

1) Flex Ring, American Cast Iron Pipe.
2) Tr-Flex, U.S. Pipe Co.
3) Snap-Lok, Griffin Pipe Products.
4) FIELD LOK 350, U.S. Pipe Co. (12-inch and smaller pipe only).
5) Fast-Grip Gasket, American Cast Iron Pipe Co. (12-inch and smaller pipe only).
6) Or approved equal.
7) Joint restraint systems consisting primarily of wedge elements in rubber gaskets will not be acceptable for pipe greater than 12-inch diameter.

c. Restrained mechanical joints shall be rated for the greater of 150 psi minimum working pressure and the specified hydraulic test pressure:

1) EBAA Iron Mega-Lug.
2) Or approved equal.

3) Stainless steel tie-rod assemblies. Tie rods shall connect no less than 50 percent of the bolts in the coupled glands.

d. Mechanical joint glands and field-assembled flanges using set screws bearing directly against the pipe for restraint will not be acceptable.

5. Fittings:

a. Fittings shall conform to AWWA C110 or C153 and shall be ductile iron.

b. Fittings provided with buried pressure or flooded pipe shall have mechanical joints.

c. Fittings for gravity pipe with push-on joints shall be mechanical joints or push-on joints.

d. Provide all specials, taps and plugs as specified or indicated.

e. Flanged fittings shall be provided for flanged pipe.

f. Flange faces shall be coated with a rust-preventive compound.

6. Lining:

a. All ductile iron pipe and fittings for potable water and non-potable treated water (plant effluent water) service shall be lined with cement mortar conforming to ANSI 21.4 and AWWA C 104.

b. All ductile iron piping and fittings for air shall be un-lined.

c. All ductile iron pipe and fittings for raw or pre-treated wastewater shall be lined with one of the following:

1) Calcium aluminate mortar made of fused calcium aluminate binders and fused calcium aluminate aggregates designed for sewer pipe applications (Laforge SewperCoat). The thickness of the lining shall be at least 0.125-inch for pipe up to 12 inches in diameter and at least 0.1875-inch for larger pipe. Other details of the lining shall conform to ANSI A21.4/AWWA C104. Inside of socket shall be epoxy coated in accordance with AWWA C104.

2) Amine cured novalac epoxy coating containing at least 20 percent by volume of ceramic quartz pigment, applied to form a 40-mil nominal dry film thickness (PROTECTO 401).

d. Lining shall extend from edge of plain end to the gasket seat in the bell socket.

e. Pipe penetration and lining application shall be in accordance with the manufacturer's recommendations for the lining supplied.

7. All buried iron pipe and fittings shall be coated with manufacturer's standard exterior enamel coating. All exposed pipe and fittings shall be exterior coated with the finish coatings as specified in the plans.

8. Gaskets and Bolting Material:

a. Provide all gaskets, bolts, lubricants, and other accessories required to install pipe and fittings complete and ready for service.

b. Bolts for flanged joints shall conform to ASTM A307 Grade B.

c. Gaskets for flanged joints shall be 1/8" thick, full faced synthetic rubber.

d. Gaskets for flanged joints on air service shall be rated for 250 F minimum.

9. Polyethylene Encasement: Buried ductile iron piping and fittings shall be encased in polyethylene conforming to ASTM D1248, Type 1, Class C, Grade E-1 when noted on the plans.

10. Flanged Coupling Adapters:

a. Shall be Ford 193, Smith-Blair 913, Rockwell 913, or approved equal.

b. Couplings shall be coated per plans.

c. Flanged coupling adapters shall have anchor studs and/or tie-rod harnesses designed for the greater of 150 psi or the specified hydraulic test pressure.

d. Where couplings are used underground, Type 316 stainless steel bolts shall be used.

e. Gaskets, except for air piping, shall be neoprene rubber. Gaskets for air piping shall be suitable for operation at a temperature of 250 F.

B. Plastic Pressure Pipe and Fittings (PVC)

1. The materials of this pipe shall be uniformly blended with unplasticized polyvinyl chloride. Nothing used in its manufacture shall be injurious to humans or animals, nor shall it impart taste or odor to domestic water or in any manner alter the chemical content of waters flowing through the pipe. It shall consist of all new materials, and the manufacturer shall furnish a sworn statement that no reused or materials known as "mill shorts" were used in the manufacturer of the pipe or fittings. All pipe shall have superior high-tensile strength. Pipe shall conform to all requirements of commercial standards and ANSI, as specified on the drawings

and/or in the Piping Schedule in Section 18160. The PVC pipe shall conform to the following standard specifications:

a. AWWA C-900, Class 200, DR 14 (Green Pipe for Sewer, Blue for Water)

b. AWWAC-905 Class 200, DR 21 Cast Iron O.D. (Green Pipe for Sewer, Blue for Water)

c. ASTM 2241, 200 psi, SDR 21 (Green Pipe for Sewer, Blue for Water)

2. All plastic pipe shall be approved by and bear the National Sanitation Foundation seal of approval and will comply with the requirements for Class 12454-A or Class 12454-B virgin components as defined in ASTM D1784 with an estimated hydrostatic design basis (HDB) rating of 4000 psi (27.58 MPa) for liquid at 73.4ºF (23ºC). Pipe and fittings with elastomeric seal joints shall meet the requirements of ASTM D3139.

3. Certificates of conformance with the foregoing specifications shall be furnished with each lot of pipe supplied.

4. PVC Pipe. Pipe shall be joined by means of a rubber ring slip joint, by means of a bell joint which shall be an integral and homogeneous part of the pipe barrel.

a. At no point in the pipe bell, including the recess groove for rubber rings, shall the wall thickness be less than that for the pipe barrel.

b. Samples of pipe shall be submitted to the Engineer for acceptance.

c. Maximum laying length of pipe shall be 20 feet.

d. All pipe shall have a guide mark on the spigot end to enable checking of adequate seating into bell.

e. The manufacturer shall provide a factory representative skilled in the installation of the type of pipe purchased to instruct the Contractor's personnel in the proper procedures for connecting and laying the pipe. This instruction is to be given at the beginning of pipe laying operations.

5. Fittings for Pipe. Fittings for plastic pipe shall be ductile iron as specified. Ductile iron fittings for plastic pipe shall have a pressure rating not less than the pipe.

C. Polyvinyl Chloride (PVC) Gravity Pipe and Fittings:

1. PVC sewer pipe and fittings, sizes 4-inch through 15-inch, shall conform to ASTM D-3034, SDR 35. PVC sewer pipe and fittings, sizes 18-inch through 27-inch, shall conform to ASTM F-679, T-1. PVC sewer pipe and fittings, sizes 8-inch through 36-inch, can also conform to ASTM F-949.

2. All PVC sewer pipe and fittings shall be made of PVC plastic having a cell classification of 12454-B or 12454-C, as defined by ASTM D1784.

3. Joints shall be of the bell and spigot type. The bell shall contain a factory-installed elastomeric gasket which is positively retained. Joint shall be in conformance with ASTM D3212.

4. The gasket shall be molded or extruded and spliced from a high-grade, properly vulcanized elastomeric compound, consisting of a synthetic rubber and shall meet the low head requirements of ASTM F477.

5. Molded fittings shall be supplied with factory-installed gaskets and shall be suitable for use with SDR-35 gravity sewer pipe. Fittings shall not deflect more than pipe when loaded and bedded in the same manner.

D. Copper Tube and Fittings:

1. Copper tube shall conform to ASTM B88 - Type L for above ground installations. Buried pipe may be Type K.

2. Fittings shall be wrought copper with solder joints in accordance with ANSI B16.22.

PART 3.0 - EXECUTION

3.01 Installation

A. Install pipe in accordance with Section 18160.

3.02 Inspection

A. Inspection for acceptance of pipe will be conducted by the Engineer as soon as practical after arrival of pipe and fittings at the job site.

B. Job site inspection takes precedence over any prior inspection.

3.03 Acceptance

A. Pipe will be inspected by Engineer for acceptance by owner at the construction site. Acceptance at the job site shall be paramount. Prior approval or payment for pipe rejected at the job site shall be null and void. Acceptance by Engineer at a point in the sequence of manufacture, delivery and installation will not relieve the Contractor of his responsibilities as set forth in the Contract Documents. Manufacturing defects that prohibit installed pipe from successfully passing leakage tests shall constitute rejection of the defective pipe.

END OF SECTION

SECTION 18130
MANHOLES AND THRUST BLOCKS

PART 1.0 - GENERAL

1.01 Summary

A. This Section includes manholes, thrust blocks, and related appurtenances.

1.02 References

A. Standards:

1. American Society for Testing and Materials (ASTM):

A48	-	Gray Iron Castings.
C76	-	Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe.
C150	-	Portland Cement.
C478	-	Precast Reinforced Concrete Manhole Sections.
C923	-	Flexible Manhole Connections.

1.03 Compliance Submittals

A. Specifications.

B. Fabrication and installation details.

PART 2.0 - PRODUCTS

2.01 Materials

A. Concrete: Reinforced, 4000 psi.

B. Manhole Frames and Covers:

1. Units cast of gray iron, free of defects, conforming to ASTM A48.

2. Machine bearing surfaces to provide even seating.

3. Coat with coal-tar pitch varnish.

4. Non-bolt down lids shall be Clay and Bailey No. 2007, Deeter 1315 with concealed pick hole or approved equal.

C. Waterproofing:

1. Manhole/vault exteriors will require a coating of Tnemec Series 46-465 or approved equal.

D. Joint Sealers:

1. E-Z STIK with primer or approved equal.

2. KOR-N-SEAL with primer.

3. Sealant material must comply with physical properties of Federal Specification SS-S-00210. Minimum width of sealant strips shall be 1 inch.

4. All joints must be wrapped with a 12-inch wide ConSeal CS-212 or approved equivalent.

2.02 Fabrication

A. Manholes:

1. Design: Construct as follows:

a. Precast manholes shall conform to ASTM C-478 except as specified herein. Minimum circumferential reinforcement per linear foot shall be as follows:

Manhole I.D.	Wall Thickness	Minimum Circumferential Reinforcement per Lineal Foot
48"	5"	0.18 sq. in.
60"	6"	0.21 sq. in.
72"	6"	0.28 sq. in.

b. Cement shall be ASTM C150, Type II.

c. Manhole adjustment rings 4" or less in height shall be fiber reinforced.

2. Connections:

a. Manhole entry pipe gasket system shall be Kor-N-Seal, Press Seal PSX, or approved equal flexible boot which allows pipe movement within the boot. Materials and leakage testing shall conform to ASTM C923.

b. Place pipe stub in manhole wall with bell or coupling outside manhole wall to provide flexible joint as indicated.

3. Joint Sealers:

a. Apply per manufacturer's instructions.

4. Manhole Frames and Covers:

a. Embedded into concrete construction where indicated on plans.

b. Set on double ring of mastic on top of manholes and grouted in place.

c. Install items level and in alignment.

PART 3.0 - EXECUTION

3.01 Manholes

A. Excavate, install, and backfill manholes per the latest edition of the American Public Works Association Standard specifications.

3.02 Concrete Anchor and Thrust Blocks

A. Install at all buried tees, elbows, bends, and dead ends on force main.

B. Place against undisturbed earth.

C. Of design indicated or specified.

1. Bearing surface area may be adjusted should field conditions be in variance with design assumption. Engineer shall be contacted to inspect actual conditions prior to placement of thrust block.

END OF SECTION

SECTION 18160
PIPE INSTALLATION

PART 1.0 - GENERAL

1.01 Summary

A. This section includes fabrication, handling, installation and testing of buried and interior pipe, fittings, valves, specials and appurtenances as indicated on the drawings and as specified herein.

B. This section does not include installation of storm and sanitary drains or plumbing.

C. Install all small piping to cooling or sealing water connections, vents, drains, control tubing, etc., required to complete the installation of each unit of mechanical equipment.

1.02 References

A. American Society for Testing and Material (ASTM):

1. C12 - Installation of Vitrified Clay Pipe Lines.
2. C828 - Low Pressure Air Test of Vitrified Clay Pipe Lines.
3. D2774-04 - Standard Practice for Underground Installation of Thermoplastic Pressure Pipe
4. D2321-04 - Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications

B. American Society of Mechanical Engineers (ASME):

1. B31 - Code for Pressure Piping.
2. B31.1 - Power Piping Section.
3. Boiler Code - Section 1.

C. American Water Works Association (AWWA):

1. C105 - Polyethylene Encasement for Gray and Ductile Cast-Iron Piping for Water and Other Liquids.
2. C206 - Field Welding of Steel Water Pipe.
3. C600 - Installation of Gray and Ductile Cast Iron Water Mains and Appurtenances.
4. C651 - Disinfecting Watermains.
5. M11 - Steel Pipe Design and Installation.

1.03 Delivery, Storage, and Handling

A. Handle pipe, valves, and fittings in a manner to insure installation in an undamaged condition.

1. Do not drop or bump.

2. Use slings, hooks and other devices designed to protect pipe, fittings, joint elements and coating when moving sections of pipe from storage area to installation location.

B. Handle pipe and fittings with equipment having an adequate factor of safety against overturning.

PART 2.0 - PRODUCTS

2.01 As Specified in Division 18

PART 3.0 - EXECUTION

3.01 Installation – Below Ground Piping

A. Belowground Piping

1. Utilize equipment, methods, and materials ensuring installation to lines and grades indicated.

a. Maintain within tolerances specified or acceptable laying schedule.

1) Alignment: 2 inches.
2) Grade: +1 inch per 100 feet.

b. Do not lay on blocks unless pipe is to receive total concrete encasement.

c. Accomplish horizontal and vertical curve alignments with fittings and pipe defections. Limit joint deflection with ductile-iron pipe and fittings to conform to AWWA C600. Deflection may, with approval, exceed standard deflections by utilizing machined bells. Deflections for PVC pipe joints shall not exceed the manufacturer's recommendations.

d. Obtain acceptance of method proposed for transfer of line and grade from control to the work.

2. Install pipe of size, materials, strength class, and joint type with embedment indicated for plan location.

3. Insofar as possible, commence laying at downstream end of line and install pipe with spigot ends in direction of flow.

4. Clean interior of all pipe, fittings, and joints prior to installation. Exclude entrance of foreign matter if work is suspended or stopped.

a. Close open ends of pipe with snug-fitting closures.

b. Do not let water fill trench. Include provisions to prevent flotation should water control measures prove inadequate.

c. Remove water, sand, mud and other undesirable material from trench before removal of end cap.

5. Brace or anchor as required to prevent displacement after establishing final position.

6. Perform only when weather and trench conditions are suitable. Do not lay in water.

7. Separation of Water Mains, Sanitary Sewers, and Combined Sewers:

a. Horizontal Separation. Whenever possible, any sanitary sewer, storm sewer, or manhole shall be laid at least 10 feet, horizontally, from a water main. The distance shall be measured from edge-to-edge. When local conditions prevent a lateral separation of 10 feet, a sanitary or storm sewer may be laid closer than 10 feet to a water main provided that the sanitary or storm sewer is laid at least 18 inches below the bottom of the water line. The water main or sewer must be constructed of mechanical joint ductile iron pipe where the lateral separation is less than 10 feet.

b. Vertical Separation: Whenever sanitary sewers, house sewers, or storm sewers must cross water mains, the sewer or drain shall be laid at such an elevation that the outside bottom of the water main is no closer than 18 inches above the outside of the top of the drain or sewer. This vertical separation shall be maintained for that portion of the sanitary sewer, house sewer, or storm sewer located within 10 feet, horizontally, of any water line it crosses. The crossing shall be arranged so that the sewer joints will be equal distance and as far as possible from the water main joints. In areas where the recommended separations cannot be obtained, either the water line or the sewer line shall be constructed of mechanical joint pipe or cased in a continuous casing that extends no less than 10 feet on both sides of the crossing.

c. Separation to Force Mains: There shall be at least a 10-foot horizontal separation between water mains and sanitary sewer force mains, and they shall be in separate trenches. In areas where these separations cannot be obtained, either the water line or the sewer line shall be cased in a continuous casing.

d. Separation to Disposal Facilities: No water line shall be located closer than 25 feet to any on-site wastewater disposal facility, agricultural waste disposal facility, or landfill.

8. Sewer Manholes: No water pipe shall be located closer than 10 feet to any part of a sewer or sewer manhole.

B. Jointing:

1. General Requirements:

a. Locate joint to provide for differential movement at changes in type of pipe embedment, impervious trench checks, and structures. Joint to be not more than 2 feet from structure wall, unless supported by concrete cradle structurally continuous with base slab or footing.

b. Perform in accordance with manufacturer's recommendations.

c. Clean and lubricate all joint and rubber gasket surfaces with lubricant recommended.

d. Utilize methods and equipment capable of fully homing or making up joints without damage.

e. Check joint opening and deflection for specification limits.

2. Special Provisions for Jointing Ductile Iron Pipe:

a. Conform to AWWA C600.

b. Visually examine while suspended and before lowering into trench.

1) Paint bell, spigot, or other suspected portions with turpentine and dust with cement to check for cracks invisible to the eye.
2) Remove turpentine and cement by washing when test is satisfactorily completed.

C. Cutting Pipe:

1. Cut in neat manner without damage to pipe.

2. Ductile iron and steel pipe to be cut with a carborundum blade saw or other acceptable methods.

3. Remove burrs and sharp edges and smooth the pipe end by grinding.

4. Repair lining where required and as approved.

D. Closure Pieces:

1. Connect two segments of pipeline or a pipeline segment and structure with short sections of pipe fabricated for the purpose.

2. Location of joints, types of joints, and pipe materials and strength classifications shall comply with specifications.

3. May be accomplished with sleeve couplings:

a. Of length, such that gaskets are not less than 3" from pipe ends.

b. Include spacer ring identical to pipe end such that clear space in closure does not exceed 1/4".

E. Remove plugs from existing pipe as indicated in order to complete connections to existing pipe. Removed plugs shall become the property of the Contractor.

F. Furnish and install test plugs where necessary to properly complete required testing.

1. Test plugs shall be as manufactured by pipe supplier.

2. Plugs shall be push-on, flanged, mechanical joint or restrained as required for ductile iron pipe and shall be watertight against heads equal to the specified test pressure.

3. Secure plugs in place to facilitate removal when required to connect pipe.

4. Restrain plugs to fittings where indicated.

G. Restrained joints or thrust blocks shall be installed where required to counteract internal pressure forces.

H. Install thrust blocks in accordance with Section 18130, Manholes and Thrust Blocks.

END OF SECTION

M-3085 PUMP SPECIFICATION

PART 1.0 – GENERAL

1.01 SUMMARY

A. Each grinder pump shall be a **heavy duty pump** modified to be used as a grinder. Each grinder pump shall contain special cutters to reduce sewage to a fine slurry. The stationary cutter shall consist of **hardened 316 "L" stainless steel** and the rotary cutter shall consist of chrome alloyed cast iron. The cutter materials shall provide maximum corrosion and abrasion resistance. The remaining portion of the grinder pumps, with the exception of seal materials and wet end, shall be similar to the heavy duty pumps used in larger pump stations for daily operation.

1.02 REQUIREMENTS

B. Furnish and install 2 submersible wastewater grinder pump(s). Each pump shall be equipped with an 4 HP, submersible electric motor connected for operation on 480 volts, 3 phase, 60 hertz, 3 wire service, with 15 feet of submersible cable (SUBCAB) suitable for submersible pump applications. The power cable shall be sized according to NEC and ICEA standards and also meet with P-MSHA Approval. The pump shall be supplied with a mating cast iron 2 inch discharge connection and be capable of delivering 35 GPM 52.3 TDH. Shut off head shall be 95 feet (minimum). Each pump shall be fitted with 6.5 feet of 304 stainless steel 3/16" lifting chain. The working load of the lifting system shall be 50% greater than the pump unit weight.

PART 2.0 – PUMP DESIGN

2.01 AVAILABLE GRINDER PUMP CONFIGURATIONS

A. MP - Guide Bar Mounting - 2" Discharge.
B. MH - Quick Disconnect - 1 1/2" Discharge.
C. MF - Free Standing - 1 1/2" Discharge.

2.02 OTHER

A. The MP Grinder pump(s) shall be automatically and firmly connected to the discharge connection, guided by no less than two guide bars extending from the top of the station to the discharge connection. There shall be no need for personnel to enter the wet-well. Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal to metal watertight contact. **Sealing of the discharge interface with a diaphragm, O-ring or profile gasket will not be acceptable**. No portion of the pump shall bear directly on the sump floor.

PART 3.0 – PUMP CONSTRUCTION

3.01 GENERAL

A. Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. The lifting handle shall be of stainless steel. All exposed nuts or bolts shall be AISI type 316 stainless steel construction. All metal surfaces coming into contact with the pumpage, other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

B. Sealing design shall incorporate **metal-to-metal contact** between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

C. Rectangular cross sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

3.02 COOLING SYSTEM

A. Motors are sufficiently cooled by the surrounding environment or pumped media. A water jacket is not required.

3.03 CABLE ENTRY SEAL

A. The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. **Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.**

3.04 MOTOR

A. The pump motor shall be a NEMA B design, induction type with a squirrel cage rotor, shell type design, housed in an air filled, watertight chamber. The stator windings shall be insulated with moisture resistant Class H insulation rated for 180°C (356°F). The stator shall be insulated by the trickle impregnation method using Class H monomer-free polyester resin resulting in a winding fill factor of at least 95%. The motor shall be inverter duty rated in accordance with NEMA MG1, Part 31. The stator shall be heat-shrink fitted into the cast iron stator housing. The use of multiple step dip and bake-type stator insulation process is not acceptable. The use of bolts, pins or other fastening devices requiring penetration of the stator housing is not acceptable. The motor shall be designed

for continuous duty handling pumped media of 40°C (104°F) and capable of no less than 30 evenly spaced starts per hour. The rotor bars and short circuit rings shall be made of cast aluminum. Thermal switches set to open at 125°C (260°F) shall be embedded in the stator end coils to monitor the temperature of each phase winding. These thermal switches shall be used in conjunction with and supplemental to external motor overload protection and shall be connected to the control panel. The motor and pump shall be designed and manufactured by the same source.

B. The combined service factor (combined effect of voltage, frequency and specific gravity) shall be a minimum of 1.15. The motor shall have a voltage tolerance of plus or minus 10%. The motor shall be designed for operation up to 40°C (104°F) ambient and with a temperature rise not to exceed 80°C. A performance chart shall be provided upon request showing curves for torque, current, power factor, input/output kW and efficiency. This chart shall also include data on starting and no-load characteristics.

C. The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chlorinated polyethylene rubber. The motor and cable shall be capable of continuous submergence underwater without loss of watertight integrity to a depth of 65 feet or greater. The motor horsepower shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

3.05 BEARINGS

A. The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two-row angular contact bearing to compensate for axial thrust and radial forces. Sleeve or single row lower bearings are not acceptable. The minimum L_{10} bearing life shall be 50,000 hours at any usable portion of the pump curve.

3.06 MECHANICAL SEAL

A. Each pump shall be provided with a tandem mechanical shaft seal system consisting of two totally independent seal assemblies. The seals shall operate in a lubricant reservoir that hydro-dynamically lubricates the lapped seal faces at a constant rate. The lower, primary seal unit, located between the pump and the lubricant chamber, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide ring. The upper, secondary seal unit, located between the lubricant chamber and the motor housing, shall contain one stationary and one positively driven rotating, corrosion and abrasion resistant tungsten-carbide seal ring.

B. Each seal interface shall be held in contact by its own spring system. The seals shall require neither maintenance nor adjustment nor depend on direction of rotation for sealing. The position of both mechanical seals shall depend on the shaft. Mounting of the lower mechanical seal on the impeller hub will not be acceptable. For special applications, other seal face materials shall be available.

C. The following seal types shall not be considered acceptable or equal to the dual independent seal specified: shaft seals without positively driven rotating members, or conventional double mechanical seals containing either a common single or double spring acting between the upper and lower seal faces. No system requiring a pressure differential to offset pressure and to effect sealing shall be used.

D. Each pump shall be provided with a lubricant chamber for the shaft sealing system. The lubricant chamber shall be designed to prevent overfilling and to provide lubricant expansion capacity. The drain and inspection plug, with positive anti-leak seal shall be easily accessible from the outside. The seal system shall not rely upon the pumped media for lubrication. The motor shall be able to operate dry without damage while pumping under load.

E. Where a seal cavity is present in the seal chamber, the area about the exterior of the lower mechanical seal in the cast iron housing shall have cast in an integral concentric spiral groove. This groove shall protect the seals by causing abrasive particulate entering the seal cavity to be forced out away from the seal due to centrifugal action.

F. Seal lubricant shall be non-hazardous.

3.07 PUMP SHAFT

A. Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The shaft shall be stainless steel – ASTM A479 S43100-T.

B. If a shaft material of lower quality than stainless steel – ASTM A479 S43100-T is used, a shaft sleeve of stainless steel – ASTM A479 S43100-T is used to protect the shaft material. However, shaft sleeves only protect the shaft around the lower mechanical seal. No protection is provided in the oil housing and above. Therefore, the use of stainless steel sleeves will not be considered equal to stainless steel shafts.

3.08 IMPELLER

A. The impeller(s) shall be of grey cast iron, Class 35B, dynamically balanced, single shrouded design having a long throughlet without acute turns. The impellers shall be capable of handling fine slurry from the special cutters. Impeller(s) shall be taper collet fitted and retained with an Allen head bolt. All impellers shall be coated with an acrylic dispersion zinc phosphate primer.

3.0 VOLUTE

A. Pump volute(s) shall be single-piece grey cast iron, Class 35B, non-concentric design with smooth passages large enough to pass any media that may enter the impeller. Minimum inlet and discharge size shall be as specified.

3.10 PROTECTION

A. All stators shall incorporate thermal switches in series to monitor the temperature of each phase winding. At 125°C (260°F) the thermal switches shall open, stop the motor and activate an alarm.

B. A leakage sensor shall be available as an option to detect water in the stator chamber. The Float Leakage Sensor (FLS) is a small float switch used to detect the presence of water in the stator chamber. When activated, the FLS will send an alarm and, if desired, stop the motor. USE OF VOLTAGE SENSITIVE SOLID STATE SENSORS AND TRIP TEMPERATURE ABOVE 125°C (260°F) SHALL NOT BE ALLOWED.

C. The thermal switches and FLS shall be connected to a Mini CAS (Control and Status) monitoring unit. The Mini CAS is designed to be mounted in any control panel.

3.11 MODIFICATIONS

A. Explosion-proof Pumps (X).
B. Seawater Applications

END OF SECTION

PREFABRICATED FRP LIFT STATION SPECIFICATIONS

PART 1.0 – GENERAL

1.01 DESCRIPTION

A. Scope of Work: Contractor shall furnish all labor, materials, equipment and performance of all work necessary or incidental to furnish and install a simplex/duplex prefabricated fiberglass reinforced polyester (FRP) lift station. The lift station shall be a completely factory-assembled unit, requiring only minor adjustments and reassembly in the field.

1.02 QUALITY ASSURANCE

A. Qualifications of Manufacturer:

1. The manufacturer shall demonstrate the ability to fabricate the various lift station components, as shown in the plans and as specified herein, utilizing adequate number of skilled workmen, equipment, tools, facilities, and subcontractors. The complete lift station shall be manufactured by Topp Industries, Inc. or pre-approved equal.

B. Referenced Standards:

1. ASTM A36 (Latest Revision): Standard Specification for Structural Steel.

2. ASTM A283D (Latest Revision): Standard Specification for Structural Steel.

3. ASTM D883 (Latest Revision): Definitions of Terms Relating to Plastics.

4. ASTM D3753 (Latest Revision): Standard Specification for Glass-Fiber-Reinforced Polyester Manholes.

5. ANSI B16.1 (Latest Revision): Standard Specification for 25 lb. Standard Flat Face Cast Iron Flanges.

1.03 SUBMITTALS

A. Shop Drawings and Manufacturer's Literature:

1. The prefabricated FRP lift station manufacturer shall prepare shop drawings for the complete lift station including structural and opening details, equipment mounting and location details, and manufacturer's cut sheets for each item of equipment in the lift station. The main component of the submittals shall be an 8½" x 11" drawing of the complete prefabricated FRP lift station prepared by the manufacturer. Manufacturer's cut sheets shall indicate capacities, dimensions, and materials of construction for all equipment in the prefabricated FRP lift station.

1.04 OPERATING AND MAINTENANCE MANUALS:

A. The prefabricated FRP lift station supplier shall prepare a complete operations and maintenance (O&M) manual for the complete lift station. The O&M manual shall include routine maintenance requirements and spare parts lists for each major item of equipment in the lift station. The names and telephone numbers of companies where spare parts and/or trained service technicians are available shall also be included for each item of equipment.

1.05 DELIVERY AND HANDLING

A. Conditions for Delivery and Handling:

1. The manufacturer of the prefabricated FRP lift station shall coordinate with the contractor so that the lift station is delivered to the jobsite on time for installation. Handling instructions shall be provided by the lift station manufacturer with the lift station to insure proper handling of the lift station structure. After delivery to the jobsite, the contractor shall store the motor control panel off the ground in a dry location until it is mounted and supplied with electrical service. The contractor shall also insure that all pump power and control cables, as well as float cables are protected from submergence until they are properly installed and sealed.

1.06 GUARANTEE

A. The prefabricated FRP lift station manufacturer shall guarantee the complete prefabricated FRP lift station to be free from defects in materials and workmanship for a period of one year from the date of delivery.

PART 2.0 – PRODUCTS

2.01 MATERIALS

A. Fiberglass Reinforced Polyester Wet Well (and Integral Valvebox): Unless otherwise indicated the plastic terminology used in this specification shall be in accordance with the definitions given in American Society for Testing and Materials (ASTM) designations D883 - Definitions of Terms Relating to Plastics.

2.02 RESINS:

A. The resins used shall be a commercial grade polyester and shall be evaluated as a laminate by test or determined by previous service to be acceptable for the intended environment. The resins used may contain the minimum amount of fillers or additives required to improve handling properties. Up to 5% by weight of thixotropic agent, which

will not interfere with visual inspection, may be added to the resin for viscosity control. Resins may contain pigments and dyes by agreement between manufacturer and engineer, recognizing that such additives may interfere with visual inspection of FRP laminate quality.

2.03 REINFORCED MATERIAL:

A. The reinforcing material shall be a commercial grade of glass fiber (continuous strand, chopped-strand, continuous mat and non-continuous mat) having a coupling agent, which will provide a suitable bond between the glass reinforcement material and resin.

2.04 LAMINATE STRUCTURE:

A. The FRP laminate shall consist of a resin rich inner surface: chop-spray interior liner; and, a chop-hoop filament- wound structural exterior layer.

1. Inner surface:

a. The resin rich inner surface shall be free of cracks and crazing with smooth finish and with an average of not over two (2) pits per square foot, providing the pits are less than 0.125 inches in diameter and 0.3125 inches in depth and are covered with sufficient resin to avoid exposure of any fiberglass reinforcement material. Some waviness shall be permissible as long as the surface is smooth. Between 0.01 to 0.02 inches of resin, rich surface shall be provided.

b. Chop-Spray Interior Liner: The interior liner shall be reinforced by 25 to 35% by weight of chopped strand glass fiber having fiber lengths from 0.5 to 2.0 inches. The chop-spray interior liner protects the chop-hoop filament-wound structural exterior liner from corrosion damage caused by “wicking” of the wet well liquid contents. A minimum of 0.100 inches of chop -spray interior liner shall be provided.

c. Chop-Hoop Filament-Wound Structural Exterior Layer:

I. The structural reinforcement of the wet well shall be by the chop-hoop filament-wound manufacturing method only. The axial reinforcement shall be continuous-strand glass fiber. The longitudinal reinforcement shall be chopped-strand glass fiber. The glass fiber reinforcement content of the chop-hoop filament wound structural exterior layer shall be 50 – 80% by weight. The exterior surface of the wet well shall be relatively smooth with no exposed reinforcement fibers or sharp projections. Hand finish work is permissible to prevent reinforcement fiber exposure. The wall thickness of the chop-

hoop filament-wound structural exterior layer shall vary with the wet well height to provide the aggregate strength necessary to meet the tensile and flexural physical properties requirements.

2.05 PHYSICAL PROPERTIES:

A. Wet Well FRP Wall Laminate: The wet well FRP wall laminate must be designed to withstand wall collapse or buckling based on the following assumptions and third-party specifications:

1. Hydrostatic Pressure of 62.4 lbs. per square foot

2. Saturated soil weight of 120 lbs. per cubic foot

3. Soil Modulus of 700 pounds per square foot

4. Pipe stiffness values as specified in ASTM D3753

The wet well FRP laminate must be constructed to withstand or exceed two times the assumed loading on any depth of the wet well.

2.06 WET WELL FRP BOTTOM LAMINATE:

A. The wet well FRP bottom laminate shall have less than 0.375 inches of center elastic deflection (deformation) when in service in totally submerged conditions.

2.07 FRP LAMINATE SURFACE HARDNESS:

A. The finished FRP laminate will have a Barcol Hardness of at least 90% of the resin manufacturer's specified hardness for the fully cured resin. The Barcol Hardness shall be the same for both interior and exterior surfaces.

2.08 WET WELL TOP FLANGE:

A. The wet well top flange shall have an outside diameter at least 4.0 inches greater than the inside diameter of the well.

B. A six-hole pattern shall accommodate the mounting of a cover with at least 0.375 inches in diameter 300 series stainless steel fasteners. Non-corroding stainless steel threaded inserts shall be fully encapsulated with non- continuous mat or chopped-strand glass fiber reinforcement. The inserts shall have an offset tab to prevent stripping or spinning out when removing and reinserting cover fasteners.

2.09 STEEL ANTI-FLOATATION FLANGE:

A. The steel anti-floatation flange shall be constructed from 0.1875 inches thick ASTM A36 structural steel plate, encapsulated in at least 0.125 inches of chopped-strand glass fiber reinforcement on all sides. The steel anti- floatation flange shall be square with outside dimensions of at least 4.0 inches greater than the wet well inside diameter. The steel anti-floatation flange shall be attached to the wet well bottom with chopped-strand glass fiber reinforcement. Contractor shall place the wet well on a concrete pad and fill with grout covering the entire steel anti-floatation flange. The amount of grout shall be sufficient to prevent floatation of the wet well based on the jobsite conditions. The steel anti-floatation flange shall not require bolt holes to secure it to the concrete pad.

2.10 PUMP QUICK DISCONNECT MOUNTING STUDS:

A. Shall be 300 series stainless steel threaded studs of at least 0.375 inches in diameter shall be used. The studs shall first be threaded into the 0.1875" inches thick ASTM A36 structural steel anti-floatation flange/bottom of the wet well and then welded into place. Once installed, the studs shall be sealed with at least two layers of non- continuous glass fiber mat or chopped-strand glass fiber reinforcement.

2.11 DISCHARGE COUPLING:

A. (1 1/4" and 2" Systems) A 1¼” or 2” NPT full coupling full welded in the center of a 14 gauge steel plate, finished with black enamel, shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer. Couplings are also available in 304 stainless steel material. (3" and 4" systems) A sufficient quantity and type of “Link-Seal” type modular, mechanical, inter-locking, synthetic rubber links shaped to continuously fill the annular space between the discharge pipe and the aluminum sleeve shall be used to provide a hydrostatic seal. The aluminum sleeve shall be bolted on the wet well or valvebox wall and sealed with silicone sealer.

2.12 ELECTRICAL COUPLING:

A. A NPT full coupling full welded in the center of an 14 gauge steel plate, finished with black enamel, shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer. Couplings are also available in 304 stainless steel material.

2.13 INLET HUB:

A. A 4” nominal pipe diameter thermoplastic pipe grommet shall be field installed by the contractor in a 5” diameter hole in the wet well wall. The pipe grommet shall provide a mechanical seal and shall not require any secondary sealing materials.

2.14 FLOAT BRACKET:

A. Float Bracket shall be fabricated from 300 series stainless steel with four compression style cord grips to maintain float level position. It shall be factory installed with at least 0.375 inches in diameter 300 series stainless steel fasteners. The wet well wall penetrations shall be sealed with silicone sealer.

2.15 VENTILATION:

A. Wet well ventilation shall comply with all applicable codes.

2.16 SLIDE RAIL ASSEMBLY:

A. The slide rail assembly shall include pump quick disconnect discharge elbow, sealing flange with rail guide, upper guiderail bracket, lifting cable and guiderails.

2.17 PUMP QUICK DISCONNECT (QDC) DISCHARGE ELBOW:

A. The pump quick disconnect (QDC) discharge elbow, made of cast iron, designed to mount directly on the wet well floor, shall be supplied for each pump. It shall have a standard ANSI B16.1 125 lb. flange, flat faced and drilled on the discharge side, with a machined mating pump connection. The design shall be such that connection between the pump and QDC is made without the need for any nuts, bolts or gaskets.

2.18 SEALING FLANGE WITH RAIL GUIDE:

A. The sealing flange with rail guide shall be mounted on each pump discharge. It shall have a machined mating flange, which matches the QDC discharge elbow. Sealing of this pump and discharge piping connection shall be accomplished by a simple linear downward motion of the pump along the guiderails culminating with the entire weight of the pumping unit supported by the QDC discharge elbow.

2.19 UPPER GUIDERAIL BRACKET:

A. The upper guiderail bracket, made from ASTM A283D structural steel, shall align and support the two guiderails at the top of the wet well. It shall bolt directly to the hatch frame (or aluminum upper guiderail bracket in wet wells with solid fiberglass covers) and incorporate a beveled stainless steel inserts for secure rail installation.

2.20 LIFTING CABLE:

A. The lifting cable shall be 300 series stainless steel with a diameter of at least 3/16” and a nominal breaking strength of at least 2500 pounds.

2.21 GUIDERAILS:

A. The guiderails shall be 2 inch schedule 40 galvanized / stainless steel pipe. There shall be two guiderails per pump to insure proper alignment with the QDC discharge elbow and

stationary piping.

2.22 SUBMERSIBLE PUMPS: NOT USED

2.23 MOTOR CONTROL PANEL: NOT USED

2.24 DISCHARGE PIPE AND FITTINGS: NOT USED

2.25 VALVES: NOT USED

2.26 SOLID FIBERGLASS COVER:

A. The solid fiberglass cover shall be constructed with continuous mat or chopped-strand glass fiber reinforcement with a minimum thickness of 0.325 inches. The cover shall be grass green in color. The cover shall be mounted to the wet well with six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

-OR-

2.26 STEEL HATCH COVER:

A. The wet well (and integral valvebox) cover shall be constructed of 0.375 inches thick black enameled ASTM A36 structural steel plate. The access hatch shall have a recessed handle and locking pin. The hatch shall be held open in the vertical position by means of a positive locking arm of corrosion resistant design. The cover shall be mounted to the wet well (and integral valvebox) with at least six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

-OR-

2.26 ALUMINUM HATCH COVER:

A. The wet well (and integral valvebox) cover shall be constructed of 0.250 inches thick mill finish aluminum diamond plate with 300 series stainless steel hardware. The access hatch shall have a recessed handle and locking pin. The hatch shall be held open in the vertical position by means of a hold open arm of corrosion resistant design. The cover shall be mounted to the wet well (and integral valvebox) with a least six 300 series stainless steel fasteners of at least 0.375 inches in diameter.

PART 3.0 – EXECUTION

3.01 LIFT STATION INSTALLATION

A. Installation:

1. The prefabricated FRP lift station shall be installed by the contractor according to

the lift station manufacturer's published instruction.

3.02 FIELD QUALITY CONTROL

A. Start-Up Service:

1. The initial startup of the prefabricated FRP lift station shall be performed by a qualified factory representative of the lift station manufacturer. It shall be the responsibility of the factory representative to supervise the startup and instruct the owner's personnel in the proper operation and maintenance procedures for the entire prefabricated FRP lift station.

END OF SECTION

EXHIBIT H - CHEROKEE METROPOLITAN DISTRICT RESOLUTION TO INCLUDE ARROWHEAD MOBILE HOME PARK

CHEROKEE METROPOLITAN DISTRICT

RESOLUTION 2018 - 03

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CHEROKEE METROPOLITAN DISTRICT INCLUDING CERTAIN REAL PROPERTY INTO THE BOUNDARIES OF THE DISTRICT

A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89°46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

WHEREAS, a Petition for Inclusion of real property into the Cherokee Metropolitan District ("District") has been received from Dayton & Leah Osborn (Trustees), as owner of the property described in **Exhibit A** attached hereto and incorporated herein;

WHEREAS, said Petition complies with all requirements of C.R.S. § 32-1-401, *et seq.*;

WHEREAS, notice of public hearing on said inclusion has been published in the Ranchland News in the form prescribed by C.R.S. § 32-1-401(1)(b);

WHEREAS, no person showed cause in writing, and no person appeared in person to show cause orally, why the Petition should not be granted;

WHEREAS, it is in the best interests of the property owner and the users of the District to grant the within inclusion.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Cherokee Metropolitan District as follows:

1. The Petition of Dayton & Leah Osborn (Trustees) for the inclusion of the real property described in **Exhibit A** attached hereto and incorporated herein into the boundaries of said Cherokee Metropolitan District is hereby granted in its entirety.

2. Staff and legal counsel, on behalf of the Board of Directors, are directed to prepare and submit to the District Court in and for the County of El Paso County, State of Colorado, all necessary and appropriate petitions and orders to legally effect the within inclusion.

DONE AND RESOLVED this 13th day of March, 2018.

CHEROKEE METROPOLITAN DISTRICT

By: _____
Janet L. Cederberg, President

ATTEST:

_____
Melody Helton, Secretary

CHEROKEE METROPOLITAN DISTRICT

NOTICE OF PUBLIC HEARING
PETITION FOR INCLUSION

NOTICE IS HEREBY GIVEN that the Board of Directors of the Cherokee Metropolitan District will hold a public hearing at its regular meeting on March 13, 2018 at 1:00 p.m., at the District's offices, located at 6250 Palmer Park Blvd., Colorado Springs, CO 80915 on a Petition for Inclusion, as described below.

Petitioners:
Dayton and Leah Osburn (Trustees)
P.O. Box 154
Chino Hills, CA 91709

General Description of Area Proposed for Exclusion:
A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89°46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

Thence the following four (4) courses:

1. Along said east right-of way line of Curtis Road N00°15'10"W a distance of 656.56 feet to intersect the north line of the aforesaid parcel.
2. Along the north line of said parcel N89°07'42"E a distance of 10.00 feet to intersect a line drawn parallel to and 40.00 feet east of the west line of said Section 15.
3. Along said parallel line S00°15'10"E a distance of 656.39 feet to intersect the south line of the aforesaid parcel.
4. Along said south line S89°52'39"W a distance of 10.00 feet to the Point of Beginning.

#7

NOTICE IS FURTHER GIVEN that all interested persons shall appear at the above designated date, time and place and provide comments on why the Petition for Inclusion should not be granted. Written comments may be submitted by the designated date and time above at the District's offices. Failure of any person within Cherokee Metropolitan District to object shall be taken as assent on his or her part to the Inclusion of the area described above.

Respectfully submitted,
Kurt Schlegel, General Manager

CHEROKEE METROPOLITAN DIST

6250 Palmer Park Blvd, Colorado Springs, CO 80915-1721
Telephone: (719) 597-5080 FAX: (719) 597-5145

PETITION FOR THE INCLUSION OF REAL PROPERTY IN THE CHEROKEE METROPOLITAN DISTRICT

To: The Board of Directors of Cherokee Metropolitan District

The undersigned Petitioner(s): * _____, being the fee owner(s) of the real property hereinafter described, hereby petition(s) that the hereinafter described real property be included in the Cherokee Metropolitan District ("District"), and in support of this Petition state(s) and represent(s) as follows:

1. That such property is capable of being served with facilities of the District.

2. That assent to the inclusion of such property in the District is hereby given by the undersigned, who constitute all the fee owners of such property.

3. That there shall be no withdrawal from this petition after consideration by the Board, nor shall further objections be filed thereto by Petitioner(s).

4. That the inclusion of such property in the District shall be subject to any and all terms and conditions established by the Board and accepted by Petitioner (s) and to all duly promulgated rules, regulations and rates of the District.

5. That the property owned by Petitioner(s) and sought to be included in the District is accurately described as follows:

(see attached Exhibit A for the Legal Description of property)

* DAYTON ORSBURN AND LEAH ORSBURN AS CO-TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1, 1991

PETITIONER

DAYTON ORSBURN
Name

PO BOX 154
Address

CHINO HILLS, CA 91709

Signed

DAYTON ORSBURN, TRUSTEE
Printed Name, Title

PETITIONER

LEAH ORSBURN
Name

PO BOX 154
Address

CHINO HILLS, CA 91709

Leah Orsburn
Signed

LEAH ORSBURN, TRUSTEE
Printed Name, Title

STATE OF COLORADO)
) SS.
COUNTY OF_____)

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by _____ _____, of _____.

Witness my hand and official seal.

My Commission Expires: _____

_____
Notary Public

PLEASE SEE ATTACHED

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of San Bernardino)

On January 8, 2018 before me, Jennifer N. Vincze, Notary Public
Date *Here Insert Name and Title of the Officer*

personally appeared Dayton Orsburn and Leah Orsburn
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

JENNIFER N. VINCZE
Commission # 2083451
Notary Public - California
San Bernardino County
My Comm. Expires Oct 24, 2018

Signature _____
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer — Title(s): _____	☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: _____	Signer Is Representing: _____

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Forth Land Surveying

12 February 2018

Legal Description

A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89°46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

Thence the following four (4) courses:

1. Along said east right-of way line of Curtis Road N00°15'10"W a distance of 656.56 feet to intersect the north line of the aforesaid parcel.
2. Along the north line of said parcel N89°07'42"E a distance of 10.00 feet to intersect a line drawn parallel to and 40.00 feet east of the west line of said Section 15.
3. Along said parallel line S00°15'10"E a distance of 656.39 feet to intersect the south line of the aforesaid parcel.
4. Along said south line S89°52'39"W a distance of 10.00 feet to the Point of Beginning.

COLORADO REGISTERED CAMERON FORTH 38390 2/12/18 PROFESSIONAL LAND SURVEYOR

Cameron Forth,
Colorado Professional Land Surveyor, #38390

stewart title

O&E REPORT

* In order to be in compliance with Colorado Department of Insurance Regulation 3-5-1, Stewart Title will begin invoicing for all **O&E Reports** on **May 1, 2010**. If you have any questions, please contact Customer Service at dcs@stewart.com.

Attn:	dayton orsburn		
Company:	arrowhead mhp		
Phone:	909.576.1324	Fax:	
Order Number:	7372701	Date Ordered: 1-8-2018	

Property Information

Owner:	Dayton Orsburn and Leah Orsburn as Co-Trustees of the JLO Trust U/T/A dated August 1, 1991
Address:	75 N. Curtis Rd Colorado Springs, CO 80930
County:	El Paso
Parcel Number:	

Legal Description

Effective Date: January 2, 2018

Ownership

Doc Type	Grantor	Grantee	Date	Reference #
Warranty Deed	Timothy Gregory and Janice [illegible]	Dayton Orsburn and Leah Orsburn as Co-Trustees of [illegible] August 1, 1991	8-20-1991	2059680-1991
Warranty Deed	Dayton Orsburn and Leah Orsburn as Co-Trustees of the JLO Trust U/T/A dated August 1, 1991	Board of County Commissioners of the County of El Paso, State of Colorado	5-19-2003	108692-2003

Deed of Trust/Mortgages

Item	Payable to	Amount	Date	Reference #
Deed of Trust	Farmers State Bank	$ 101,967.00	9-25-2013	121270-2013

Other Documents Requested

Item	Party's Name	Amount	Date	Reference #

El Paso County, Colorado

MARK LOWDERMAN, TREASURER

DATE January 12, 2018

PROPERTY TAX STATEMENT
TAXES FOR 2017 DUE 2018

TYPE OF PROPERTY
REAL PROPERTY

17670

SCHEDULE (ACCOUNT) NUMBER
44150-00-020

PROPERTY LOCATION
75 CURTIS RD N

PROPERTY DESCRIPTION
S2SW4NW4, EX THAT PT CONV TO COUNTY BY REC #203108692

EXHIBIT A - LEGAL DESCRIPTION OF PROPERTY

44150-00-020
ORSBURN DAYTON & LEAH CO-TRUSTEES
PO BOX 154
CHINO HILLS CA 91709-0006

TAX DISTRICT	KB5	ACTUAL VALUE	$ 467,261	ASSESSED VALUE	$ 33,650

TAX RATE	TAX AUTHORITY		TAX AMOUNT
0.007635	EL PASO COUNTY		256.92
0.000330	EPC ROAD & BRIDGE (UNSHARED)		11.10
0.027011	ELLICOTT SCHOOL NO 22	- GEN	908.92
0.010000	ELLICOTT SCHOOL NO 22	- BOND	336.50
0.003812	* PIKES PEAK LIBRARY		128.27
0.009515	ELLICOTT FIRE PROTECTION		320.18
	*TEMPORARY TAX RATE REDUCTION/TAX CREDIT		
0.058303	**TOTAL TAX RATE**	**TOTAL TAXES PAYABLE**	**$ 1,961.89**

2018441500002001200000000000000980946

NOTE: Tax bills must be mailed to the property owner. If you have a mortgage, check with them before paying your taxes.

TO PAY ON-LINE OR VIEW YOUR ACCOUNT:
HTTP://TRS.ELPASOCO.COM

MAKE CHECKS PAYABLE TO:
EL PASO COUNTY TREASURER

MAIL PAYMENT TO:
EL PASO COUNTY TREASURER
P.O. BOX 2018
COLO. SPGS.,CO 80901-2018

TELEPHONE 719-520-7900
e-mail: trsweb@elpasoco.com
Office Location:
1675 Garden of the Gods Rd,
Suite 2100, Colo. Spgs., CO 80907

YOUR SCHOOL DISTRICT GENERAL FUND TAX RATE IS 0.027011
ABSENT STATE AID, IT WOULD HAVE BEEN 0.284648

ADDRESS CHANGE INFORMATION-
SEE REVERSE SIDE

PAYMENT COUPON 2

EL PASO COUNTY, COLORADO
2ND HALF - DUE JUNE 15, 2018
NO SECOND HALF STATEMENT WILL BE MAILED

2018

SCHEDULE NUMBER 44150-00-020

OWNER'S NAME ORSBURN DAYTON & LEAH CO-TRUSTEES

SECOND HALF AMOUNT DUE BY 6-15-2018 $ 980.94

Do you have a mortgage? Check with them before paying your taxes.
Include a stamped, self-addressed envelope for a printed receipt.

2018441500002001200000980950000196189 8

PAYMENT COUPON 1

EL PASO COUNTY, COLORADO
1ST HALF - DUE FEBRUARY 28, 2018 **OR**
FULL TAX - DUE APRIL 30, 2018

2018

SCHEDULE NUMBER 44150-00-020

OWNER'S NAME ORSBURN DAYTON & LEAH CO-TRUSTEES

FIRST HALF AMOUNT DUE BY 2-28-2018 $ 980.95

FULL AMOUNT DUE BY 4-30-2018 $ 1,961.89

Do you have a mortgage? Check with them before paying your taxes.
Include a stamped, self-addressed envelope for a printed receipt.

8 20 1991

02059689

91 AUG 20 AM 9:19

ARDIS W. SCHMITT
EL PASO COUNTY CLERK & RECORDER

BOOK 6872 PAGE 1387

Filed for record this _____ day of _____ A.D. _____ at _____ o'clock _____ M.

No. _____ RECORDER

Warranty Deed

Known all Men by these Presents, That TIMOTHY GREGORY and JANICE GREGORY of the County of EL PASO and State of COLORADO, for the consideration of One Dollar and other good and valuable considerations, in hand paid, hereby sell and convey to DAYTON ORSBURN AND LEAH ORSBURN AS CO-TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1, 1991 "in Joint Tenancy", of the County of _____ and State of _____ whose mailing address is _____, the following Real Property situate in the County of EL PASO and State of Colorado, (*Assessor's Schedule Number* 44150-00-003) to-wit:

SDF $24.00

$5.00

The South half of the Southwest Quarter of the Northwest Quarter of Section 15, Township 14 South, Range 64 West of the 6th P.M., in El Paso County, Colorado.

Purported Street Address: 75 CURTIS ROAD NORTH

** 1991 taxes and all subsequent years, restrictions, reservations, covenants, easements and rights-of-way of record, if any.

STATE DOCUMENTARY

AUG 20 1991

FEE 24.**

with all its appurtenances and warrant(s) the title to the same, subject to **

Signed and delivered this 15th day of August, 19 91

TIMOTHY GREGORY

JANICE GREGORY

by Timothy Gregory as attorney in fact

STATE OF COLORADO
County of EL PASO } ss. The foregoing instrument was acknowledged before me this 15th day of August, 19 91 by TIMOTHY GREGORY and JANICE GREGORY by TIMOTHY GREGORY AS ATTORNEY IN FACT

Witness my hand and official seal.
My commission expires December 31, 1992

Sally Shelton NOTARY PUBLIC

STATE OF _____
County of _____ } ss. The foregoing instrument was acknowledged before me this _____ day of _____, 19____, by _____ as _____ President and _____ as _____ Secretary of _____ a corporation.

Witness my hand and official seal.
My commission expires _____

NOTARY PUBLIC

*If joint tenancy is not desired, strike the phrase between the asterisks.

FORM 3206 WARRANTY DEED CENTER PRINTING CO. COLORADO SPRINGS

91040518

Robert C. Balink El Paso Cty,CO 203108692
05/19/2003 03:55
Doc $0.00 Page
Rec $10.00 1 of 2

Filed for record the _____ day _____ RECORDER.
Reception No. _____ By _____ DEPUTY.

SPECIAL WARRANTY DEED

THIS DEED, Made on this day of May 13, 2003, between
DAYTON ORSBURN AND LEAH ORSBURN, AS CO-TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1, 1991

whose legal address is: 2028 TURQUOISE CIR CHINO HILLS CA 91709
Grantor(s),
and
BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF EL PASO, STATE OF COLORADO

whose legal address is: 27 E. VERMIJO 3RD FL COLORADO SPRINGS, COLORADO 80903
of the Grantee(s):

WITNESS, That the Grantor, for and in consideration of the sum of ($7,000.00)
*** Seven Thousand and 00/100 ***
DOLLARS
the receipt and sufficiency of which is hereby acknowledged, has granted, bargained, sold and conveyed, and by these presents does grant, bargain, sell, convey and confirm unto the Grantee(s), their heirs and assigns forever, all the real property, together with improvements, if any, situate, lying and being in the _____ County of EL PASO and State of Colorado, described as follows:
SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF

also known as street number 75 NORTH CURTIS ROAD, COLORADO SPRINGS, CO 80930

TOGETHER with all and singular and hereditaments and appurtenances thereunto belonging, or in anywise appertaining and the reversion and reversions, remainder and remainders, rents, issues and profits thereof; and all the estate, right title interest, claim and demand whatsoever of the Grantor(s), either in law or equity, of, in and to the above bargained premises, with the hereditaments and appurtenances;

TO HAVE AND TO HOLD the said premises above bargained and described with appurtenances, unto the Grantee(s), their heirs, successors and assigns forever. The Grantor, for itself, its successors and assigns, does covenant, and agree that it shall and will WARRANT AND FOREVER DEFEND the above-bargained premises in the quiet and peaceable possession of the Grantee(s), their heirs, successors and assigns, against all and every person or persons claiming the whole or any part thereof, by, through or under the Grantor(s).
EXCEPT GENERAL TAXES AND ASSESSMENTS FOR THE YEAR 2003 AND SUBSEQUENT YEARS, AND SUBJECT TO EASEMENTS, RESERVATIONS, RESTRICTIONS, COVENANTS AND RIGHTS OF WAY OF RECORD, IF ANY

IN WITNESS WHEREOF the Grantor(s) have executed this deed on the date set forth above.

THE JLO TRUST U/T/A DATED AUGUST 1, 1991
BY DAYTON ORSBURN, CO-TRUSTEE
BY LEAH ORSBURN, CO-TRUSTEE

STATE OF Colorado)
)ss.
County of EL PASO)

The foregoing instrument was acknowledged before me on this day of May 13, 2003
by DAYTON ORSBURN AND LEAH ORSBURN, AS CO-TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1, 1991

My commission expires
Witness my hand and official seal.

AMANDA COOPER
NOTARY PUBLIC
STATE OF COLORADO
My Commission Expires Mar. 15, 2004

Amanda Cooper
Notary Public

Escrow# CCSP157276
Title# SC157276
Form No. COMM.SWD

When Recorded Return to: BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF EL PASO, STATE OF COLORADO
27 E. VERJIMO 3RD FL COLO SPGS, CO 80903

Land Title GUARANTEE COMPANY

EXHIBIT A

PARCEL A: SITUATE IN SECTION 15, TOWNSHIP 14 SOUTH, RANGE 64 WEST OF THE 6TH P.M. EL PASO COUNTY, COLORADO.

A PORTION OF THAT PARCEL RECORDED IN BOOK 5872 AT PAGE 1387, RECEPTION NUMBER 2059689, OF THE RECORDS OF THE CLERK AND RECORDER, EL PASO COUNTY, COLORADO, DESCRIBED AS FOLLOWS:

FROM THE POINT OF COMMENCEMENT AT THE WEST QUARTER CORNER OF SECTION 15, THENCE N 89 DEGREES 46'41" E A DISTANCE OF 30.00 FEET TO INTERSECT THE EXISTING EAST RIGHT-OF-WAY LINE OF CURTIS ROAD FOR THE POINT OF BEGINNING. THENCE THE FOLLOWING FOUR (4) COURSES:

1. ALONG SAID EAST RIGHT-OF-WAY LINE OF CURTIS ROAD N 00 DEGREES 15'10" W A DISTANCE OF 656.56 FEET TO INTERSECT THE NORTH LINE OF THE AFORESAID PARCEL.
2. ALONG THE NORTH LINE OF SAID PARCEL N 89 DEGREES 07'42" E A DISTANCE OF 10.00 FEET TO INTERSECT A LINE DRAWN PARALLEL TO AND 40.00 FEET EAST OF THE WEST LINE OF SAID SECTION 15.
3. ALONG SAID PARALLEL LINE S 00 DEGREES 15'10" E A DISTANCE OF 656.39 FEET TO INTERSECT THE SOUTH LINE OF THE AFORESAID PARCEL.
4. ALONG SAID SOUTH LINE S 89 DEGREES 52'39" W A DISTANCE OF 10.00 FEET TO THE POINT OF BEGINNING.

213121270 09/25/2013 12:00:55
PGS 7 $41.00 DF $ 0

Electronically Recorded Official Records El Paso County CO
Wayne W. Williams Clerk and Recorder
TD1000 N

RECORDATION REQUESTED BY:
Farmers State Bank of Calhan
Ellicott Branch
445 North Ellicott Highway
Calhan, CO 80808

WHEN RECORDED MAIL TO:
Farmers State Bank of Calhan
Ellicott Branch
445 North Ellicott Highway
Calhan, CO 80808

SEND TAX NOTICES TO:
Farmers State Bank of Calhan
Ellicott Branch
445 North Ellicott Highway
Calhan, CO 80808

FOR RECORDER'S USE ONLY

DEED OF TRUST

MAXIMUM PRINCIPAL AMOUNT SECURED. The Lien of this Deed of Trust shall not exceed at any one time $101,857.00 except as allowed under applicable Colorado law.

THIS DEED OF TRUST is dated August 5, 2013, among DAYTON ORSBURN and LEAH ORSBURN AS CO TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1 1991 ("Grantor"); Farmers State Bank of Calhan, whose address is Ellicott Branch, 445 North Ellicott Highway, Calhan, CO 80808 (referred to below sometimes as "Lender" and sometimes as "Beneficiary"); and the Public Trustee of ELPASO County, Colorado (referred to below as "Trustee").

CONVEYANCE AND GRANT. For valuable consideration, Grantor hereby irrevocably grants, transfers and assigns to Trustee for the benefit of Lender as Beneficiary all of Grantor's right, title, and interest in and to the following described real property, together with all existing or subsequently erected or affixed buildings, improvements and fixtures; all easements, rights of way, and appurtenances; all water, water rights and ditch rights (including stock in utilities with ditch or irrigation rights); and all other rights, royalties, and profits relating to the real property, including without limitation all minerals, oil, gas, geothermal and similar matters, (the "Real Property") located in ELPASO County, State of Colorado:

THE SOUTH HALF OF THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER OF SECTION 15, TOWNSHIP 14 SOUTH, RANGE 64 WEST OF THE 6TH P.M., EXCEPT THAT PORTION CONVEYED BY SPECIAL WARRANTY DEED RECORDED MAY 19, 2003 AT RECEPTION NO. 203109092, EL PASO COUNTY, COLORADO.

The Real Property or its address is commonly known as 75 N CURTIS RD, COLORADO SPRINGS , CO 80930. The Real Property tax identification number is 4415000020.

REVOLVING LINE OF CREDIT. This Deed of Trust secures the indebtedness including, without limitation, a revolving line of credit, which obligates Lender to make advances to Borrower so long as Borrower complies with all the terms of the Note.

Grantor presently assigns to Lender (also known as Beneficiary in this Deed of Trust) all of Grantor's right, title, and interest in and to all present and future leases of the Property and all Rents from the Property. In addition, Grantor grants to Lender a Uniform Commercial Code security interest in the Personal Property and Rents.

THIS DEED OF TRUST, INCLUDING THE ASSIGNMENT OF RENTS AND THE SECURITY INTEREST IN THE RENTS AND PERSONAL PROPERTY, IS GIVEN TO SECURE (A) PAYMENT OF THE INDEBTEDNESS AND (B) PERFORMANCE OF ANY AND ALL OBLIGATIONS UNDER THE NOTE, THE RELATED DOCUMENTS, AND THIS DEED OF TRUST. THIS DEED OF TRUST IS GIVEN AND ACCEPTED ON THE FOLLOWING TERMS:

GRANTOR'S REPRESENTATIONS AND WARRANTIES. Grantor warrants that: (a) this Deed of Trust is executed at Borrower's request and not at the request of Lender; (b) Grantor has the full power, right, and authority to enter into this Deed of Trust and to hypothecate the Property; (c) the provisions of this Deed of Trust do not conflict with, or result in a default under any agreement or other instrument binding upon Grantor and do not result in a violation of any law, regulation, court decree or order applicable to Grantor; (d) Grantor has established adequate means of obtaining from Borrower on a continuing basis information about Borrower's financial condition; and (e) Lender has made no representation to Grantor about Borrower (including without limitation the creditworthiness of Borrower).

GRANTOR'S WAIVERS. Grantor waives all rights or defenses arising by reason of any "one action" or "anti-deficiency" law, or any other law which may prevent Lender from bringing any action against Grantor, including a claim for deficiency to the extent Lender is otherwise entitled to a claim for deficiency, before or after Lender's commencement or completion of any foreclosure action, either judicially or by exercise of a power of sale.

PAYMENT AND PERFORMANCE. Except as otherwise provided in this Deed of Trust, Borrower shall pay to Lender all indebtedness secured by this Deed of Trust as it becomes due, and Borrower and Grantor shall perform all their respective obligations under the Note, this Deed of Trust, and the Related Documents.

POSSESSION AND MAINTENANCE OF THE PROPERTY. Borrower and Grantor agree that Borrower's and Grantor's possession and use of the Property shall be governed by the following provisions:

Possession and Use. Until the occurrence of an Event of Default, Grantor may (1) remain in possession and control of the Property; (2) use, operate or manage the Property; and (3) collect the Rents from the Property.

Duty to Maintain. Grantor shall maintain the Property in tenantable condition and promptly perform all repairs, replacements, and maintenance necessary to preserve its value.

Compliance With Environmental Laws. Grantor represents and warrants to Lender that: (1) During the period of Grantor's ownership of the Property, there has been no use, generation, manufacture, storage, treatment, disposal, release or threatened release of any Hazardous Substance by any person on, under, about or from the Property; (2) Grantor has no knowledge of, or reason to believe that there has been, except as previously disclosed to and acknowledged by Lender in writing, (a) any breach or violation of any Environmental Laws, (b) any use, generation, manufacture, storage, treatment, disposal, release or threatened release of any Hazardous Substance on, under, about or from the Property by any prior owners or occupants of the Property, or (c) any actual or threatened litigation or claims of any kind by any person relating to such matters; and (3) Except

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as previously disclosed to and acknowledged by Lender in writing, (a) neither Grantor nor any tenant, contractor, agent or other authorized user of the Property shall use, generate, manufacture, store, treat, dispose of or release any Hazardous Substance on, under, about or from the Property; and (b) any such activity shall be conducted in compliance with all applicable federal, state, and local laws, regulations and ordinances, including without limitation all Environmental Laws. Grantor authorizes Lender and its agents to enter upon the Property to make such inspections and tests, at Grantor's expense, as Lender may deem appropriate to determine compliance of the Property with this section of the Deed of Trust. Any inspections or tests made by Lender shall be for Lender's purposes only and shall not be construed to create any responsibility or liability on the part of Lender to Grantor or to any other person. The representations and warranties contained herein are based on Grantor's due diligence in investigating the Property for Hazardous Substances. Grantor hereby (1) releases and waives any future claims against Lender for indemnity or contribution in the event Grantor becomes liable for cleanup or other costs under any such laws; and (2) agrees to indemnify, defend, and hold harmless Lender against any and all claims, losses, liabilities, damages, penalties, and expenses which Lender may directly or indirectly sustain or suffer resulting from a breach of this section of the Deed of Trust or as a consequence of any use, generation, manufacture, storage, disposal, release or threatened release occurring prior to Grantor's ownership or interest in the Property, whether or not the same was or should have been known to Grantor. The provisions of this section of the Deed of Trust, including the obligation to indemnify and defend, shall survive the payment of the indebtedness and the satisfaction and reconveyance of the lien of this Deed of Trust and shall not be affected by Lender's acquisition of any interest in the Property, whether by foreclosure or otherwise.

Nuisance, Waste. Grantor shall not cause, conduct or permit any nuisance nor commit, permit, or suffer any stripping of or waste on or to the Property or any portion of the Property. Without limiting the generality of the foregoing, Grantor will not remove, or grant to any other party the right to remove, any timber, minerals (including oil and gas), coal, clay, scoria, soil, gravel or rock products without Lender's prior written consent.

Removal of Improvements. Grantor shall not demolish or remove any Improvements from the Real Property without Lender's prior written consent. As a condition to the removal of any Improvements, Lender may require Grantor to make arrangements satisfactory to Lender to replace such Improvements with Improvements of at least equal value.

Lender's Right to Enter. Lender and Lender's agents and representatives may enter upon the Real Property at all reasonable times to attend to Lender's interests and to inspect the Real Property for purposes of Grantor's compliance with the terms and conditions of this Deed of Trust.

Compliance with Governmental Requirements. Grantor shall promptly comply with all laws, ordinances, and regulations, now or hereafter in effect, of all governmental authorities applicable to the use or occupancy of the Property, including without limitation, the Americans With Disabilities Act. Grantor may contest in good faith any such law, ordinance, or regulation and withhold compliance during any proceeding, including appropriate appeals, so long as Grantor has notified Lender in writing prior to doing so and so long as, in Lender's sole opinion, Lender's interests in the Property are not jeopardized. Lender may require Grantor to post adequate security or a surety bond, reasonably satisfactory to Lender, to protect Lender's interest.

Duty to Protect. Grantor agrees neither to abandon or leave unattended the Property. Grantor shall do all other acts, in addition to those acts set forth above in this section, which from the character and use of the Property are reasonably necessary to protect and preserve the Property.

TAXES AND LIENS. The following provisions relating to the taxes and liens on the Property are part of this Deed of Trust:

Payment. Grantor shall pay when due (and in all events prior to delinquency) all taxes, special taxes, assessments, charges (including water and sewer), fines and impositions levied against or on account of the Property, and shall pay when due all claims for work done on or for services rendered or material furnished to the Property. Grantor shall maintain the Property free of all liens having priority over or equal to the interest of Lender under this Deed of Trust, except for the lien of taxes and assessments [illegible]

Right to Contest. Grantor may withhold payment of any tax, assessment, or claim in connection with a good faith dispute over the obligation to pay, so long as Lender's interest in the Property is not jeopardized. If a lien arises or is filed as a result of nonpayment, Grantor shall within fifteen (15) days after the lien arises or, if a lien is filed, within fifteen (15) days after Grantor has notice of the filing, secure the discharge of the lien, or if requested by Lender, deposit with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender in an amount sufficient to discharge the lien plus any costs and attorneys' fees, or other charges that could accrue as a result of a foreclosure or sale under the lien. In any contest, Grantor shall defend itself and Lender and shall satisfy any adverse judgment before enforcement against the Property. Grantor shall name Lender as an additional obligee under any surety bond furnished in the contest proceedings.

Evidence of Payment. Grantor shall upon demand furnish to Lender satisfactory evidence of payment of the taxes or assessments and shall authorize the appropriate governmental official to deliver to Lender at any time a written statement of the taxes and assessments against the Property.

Notice of Construction. Grantor shall notify Lender at least fifteen (15) days before any work is commenced, any services are furnished, or any materials are supplied to the Property, if any mechanic's lien, materialmen's lien, or other lien could be asserted on account of the work, services, or materials. Grantor will upon request of Lender furnish to Lender advance assurances satisfactory to Lender that Grantor can and will pay the cost of such improvements.

PROPERTY DAMAGE INSURANCE. The following provisions relating to insuring the Property are a part of this Deed of Trust.

Maintenance of Insurance. Grantor shall procure and maintain policies of fire insurance with standard extended coverage endorsements on a fair value basis for the full insurable value covering all improvements on the Real Property in an amount sufficient to avoid application of any coinsurance clause, and with a standard mortgage clause in favor of Lender. Grantor shall also procure and maintain comprehensive general liability insurance in such coverage amounts as Lender may request with Trustee and Lender being named as additional insureds in such liability insurance policies. Additionally, Grantor shall maintain such other insurance, including but not limited to hazard, business interruption, and boiler insurance, as Lender may reasonably require. Policies shall be written in form, amounts, coverages and basis reasonably acceptable to Lender and issued by a company or companies reasonably acceptable to Lender. Grantor, upon request of Lender, will deliver to Lender from time to time the policies or certificates of insurance in form satisfactory to Lender, including stipulations that coverages will not be cancelled or diminished without at least thirty (30) days prior written notice to Lender. Each insurance policy also shall include an endorsement providing that coverage in favor of Lender will not be impaired in any way by any act, omission or default of Grantor or any other person. Should the Real Property be located in an area designated by the Director of the Federal Emergency Management Agency as a special flood hazard area, Grantor agrees to obtain and maintain Federal Flood Insurance, if available, within 45 days after notice is given by Lender that the Property is located in a special flood hazard area, for the full unpaid principal balance of the loan and any prior liens on the property securing the loan, up to the maximum policy limits set under the National Flood Insurance Program, or as otherwise required by Lender, and to maintain such insurance for the term of the loan.

Application of Proceeds. Grantor shall promptly notify Lender of any loss or damage to the Property. Lender may make proof of loss if Grantor fails to do so within fifteen (15) days of the casualty. Whether or not Lender's security is impaired, Lender may, at Lender's election, receive and retain the proceeds of any insurance and apply the proceeds to the reduction of the indebtedness, payment of any lien affecting the Property, or the restoration and repair of the Property. If Lender elects to apply the proceeds to restoration and repair, Grantor shall repair or replace the damaged or destroyed Improvements in a manner satisfactory to Lender. Lender shall, upon satisfactory proof of such expenditure, pay or reimburse Grantor from the proceeds for the reasonable cost of repair or restoration if Grantor is not in default under this Deed of Trust. Any proceeds which have not been disbursed within 180 days after their receipt and which Lender has not committed to the repair or restoration of the

Property shall be used first to pay any amount owing to Lender under this Deed of Trust, then to pay accrued interest, and the remainder, if any, shall be applied to the principal balance of the Indebtedness. If Lender holds any proceeds after payment in full of the Indebtedness, such proceeds shall be paid to Grantor as Grantor's interests may appear.

Grantor's Report on Insurance. Upon request of Lender, however not more than once a year, Grantor shall furnish to Lender a report on each existing policy of insurance showing: (1) the name of the insurer; (2) the risks insured; (3) the amount of the policy; (4) the property insured, the then current replacement value of such property, and the manner of determining that value; and (5) the expiration date of the policy. Grantor shall, upon request of Lender, have an independent appraiser satisfactory to Lender determine the cash value replacement cost of the Property.

LENDER'S EXPENDITURES. If any action or proceeding is commenced that would materially affect Lender's interest in the Property or if Grantor fails to comply with any provision of this Deed of Trust or any Related Documents, including but not limited to Grantor's failure to discharge or pay when due any amounts Grantor is required to discharge or pay under this Deed of Trust or any Related Documents, Lender on Grantor's behalf may (but shall not be obligated to) take any action that Lender deems appropriate, including but not limited to discharging or paying all taxes, liens, security interests, encumbrances and other claims, at any time levied or placed on the Property and paying all costs for insuring, maintaining and preserving the Property. All such expenditures incurred or paid by Lender for such purposes will then bear interest at the rate charged under the Note from the date incurred or paid by Lender to the date of repayment by Grantor. All such expenses will become a part of the Indebtedness and, at Lender's option, will (A) be payable on demand; (B) be added to the balance of the Note and be apportioned among and be payable with any installment payments to become due during either (1) the term of any applicable insurance policy; or (2) the remaining term of the Note; or (C) be treated as a balloon payment which will be due and payable at the Note's maturity. The Deed of Trust also will secure payment of these amounts. Such right shall be in addition to all other rights and remedies to which Lender may be entitled upon Default.

WARRANTY; DEFENSE OF TITLE. The following provisions relating to ownership of the Property are a part of this Deed of Trust:

Title. Grantor warrants that: (a) Grantor holds good and marketable title of record to the Property in fee simple, free and clear of all liens and encumbrances other than those set forth in the Real Property description or in any title insurance policy, title report, or final title opinion issued in favor of, and accepted by, Lender in connection with this Deed of Trust, and (b) Grantor has the full right, power, and authority to execute and deliver this Deed of Trust to Lender.

Defense of Title. Subject to the exception in the paragraph above, Grantor warrants and will forever defend the title to the Property against the lawful claims of all persons. In the event any action or proceeding is commenced that questions Grantor's title or the interest of Trustee or Lender under this Deed of Trust, Grantor shall defend the action at Grantor's expense. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of Lender's own choice, and Grantor will deliver, or cause to be delivered, to Lender such instruments as Lender may request from time to time to permit such participation.

Compliance With Laws. Grantor warrants that the Property and Grantor's use of the Property complies with all existing applicable laws, ordinances, and regulations of governmental authorities.

Survival of Representations and Warranties. All representations, warranties, and agreements made by Grantor in this Deed of Trust shall survive the execution and delivery of this Deed of Trust, shall be continuing in nature, and shall remain in full force and effect until such time as Borrower's Indebtedness shall be paid in full.

CONDEMNATION. The following provisions relating to condemnation proceedings are a part of this Deed of Trust:

Proceedings. If any proceeding in condemnation is filed, Grantor shall promptly notify Lender in writing, and Grantor shall promptly take such steps as may be necessary to defend the action and obtain the award. Grantor may be the nominal party in such proceeding, but Lender shall be entitled to participate in the proceeding and to be represented in the proceeding by counsel of its own choice, and Grantor will deliver or cause to be delivered to Lender such instruments and documentation as may be requested by Lender from time to time to permit such participation.

Application of Net Proceeds. If all or any part of the Property is condemned by eminent domain proceedings or by any proceeding or purchase in lieu of condemnation, Lender may at its election require that all or any portion of the net proceeds of the award be applied to the Indebtedness or the repair or restoration of the Property. The net proceeds of the award shall mean the award after payment of all reasonable costs, expenses, and attorneys' fees incurred by Trustee or Lender in connection with the condemnation.

IMPOSITION OF TAXES, FEES AND CHARGES BY GOVERNMENTAL AUTHORITIES. The following provisions relating to governmental taxes, fees and charges are a part of this Deed of Trust:

Current Taxes, Fees and Charges. Upon request by Lender, Grantor shall execute such documents in addition to this Deed of Trust and take whatever other action is requested by Lender to perfect and continue Lender's lien on the Real Property. Grantor shall reimburse Lender for all taxes, as described below, together with all expenses incurred in recording, perfecting or continuing this Deed of Trust, including without limitation all taxes, fees, documentary stamps, and other charges for recording or registering this Deed of Trust.

Taxes. The following shall constitute taxes to which this section applies: (1) a specific tax upon this type of Deed of Trust or upon all or any part of the Indebtedness secured by this Deed of Trust; (2) a specific tax on Borrower which Borrower is authorized or required to deduct from payments on the Indebtedness secured by this type of Deed of Trust; (3) a tax on this type of Deed of Trust chargeable against the Lender or the holder of the Note; and (4) a specific tax on all or any portion of the Indebtedness or on payments of principal and interest made by Borrower.

Subsequent Taxes. If any tax to which this section applies is enacted subsequent to the date of this Deed of Trust, this event shall have the same effect as an Event of Default, and Lender may exercise any or all of its available remedies for an Event of Default as provided below unless Grantor either (1) pays the tax before it becomes delinquent, or (2) contests the tax as provided above in the Taxes and Liens section and deposits with Lender cash or a sufficient corporate surety bond or other security satisfactory to Lender.

SECURITY AGREEMENT; FINANCING STATEMENTS. The following provisions relating to this Deed of Trust as a security agreement are a part of this Deed of Trust:

Security Agreement. This instrument shall constitute a Security Agreement to the extent any of the Property constitutes fixtures, and Lender shall have all of the rights of a secured party under the Uniform Commercial Code as amended from time to time.

Security Interest. Upon request by Lender, Grantor shall take whatever action is requested by Lender to perfect and continue Lender's security interest in the Rents and Personal Property. In addition to recording this Deed of Trust in the real property records, Lender may, at any time and without further authorization from Grantor, file executed counterparts, copies or reproductions of this Deed of Trust as a financing statement. Grantor shall reimburse Lender for all expenses incurred in perfecting or continuing this security interest. Upon default, Grantor shall not remove, sever or detach the Personal Property from the Property. Upon default, Grantor shall assemble any Personal Property not affixed to the Property in a manner and at a place reasonably convenient to Grantor and Lender and make it available to Lender within three (3) days after receipt of written demand from Lender to the extent permitted by applicable law.

Addresses. The mailing addresses of Grantor (debtor) and Lender (secured party) from which information concerning the security interest granted by this Deed of Trust may be obtained (each as required by the Uniform Commercial Code) are as stated on the first page of this Deed of Trust.

FURTHER ASSURANCES; ATTORNEY-IN-FACT. The following provisions relating to further assurances and attorney-in-fact are a part of this Deed of Trust:

Further Assurances. At any time, and from time to time, upon request of Lender, Grantor will make, execute and deliver, or will cause to be made, executed or delivered, to Lender or to Lender's designee, and when requested by Lender, cause to be filed, recorded, refiled, or rerecorded, as the case may be, at such times and in such offices and places as Lender may deem appropriate, any and all such mortgages, deeds of trust, security deeds, security agreements, financing statements, continuation statements, instruments of further assurance, certificates, and other documents as may, in the sole opinion of Lender, be necessary or desirable in order to effectuate, complete, perfect, continue, or preserve (1) Borrower's and Grantor's obligations under the Note, this Deed of Trust, and the Related Documents, and (2) the liens and security interests created by this Deed of Trust as first and prior liens on the Property, whether now owned or hereafter acquired by Grantor. Unless prohibited by law or Lender agrees to the contrary in writing, Grantor shall reimburse Lender for all costs and expenses incurred in connection with the matters referred to in this paragraph.

Attorney-in-Fact. If Grantor fails to do any of the things referred to in the preceding paragraph, Lender may do so for and in the name of Grantor and at Grantor's expense. For such purposes, Grantor hereby irrevocably appoints Lender as Grantor's attorney-in-fact for the purpose of making, executing, delivering, filing, recording, and doing all other things as may be necessary or desirable, in Lender's sole opinion, to accomplish the matters referred to in the preceding paragraph.

FULL PERFORMANCE. Upon the full performance of all the obligations under the Note and this Deed of Trust, Trustee may, upon production of documents and fees as required under applicable law, release this Deed of Trust, and such release shall constitute a release of the lien for all such additional sums and expenditures made pursuant to this Deed of Trust. Lender agrees to cooperate with Grantor in obtaining such release and releasing the other collateral securing the Indebtedness. Any release fees required by law shall be paid by Grantor, if permitted by applicable law.

EVENTS OF DEFAULT. Each of the following, at Lender's option, shall constitute an Event of Default under this Deed of Trust:

Payment Default. Borrower fails to make any payment when due under the Indebtedness.

Other Defaults. Borrower or Grantor fails to comply with or to perform any other term, obligation, covenant or condition contained in this Deed of Trust or in any of the Related Documents or to comply with or to perform any term, obligation, covenant or condition contained in any other agreement between Lender and Borrower or Grantor.

Compliance Default. Failure to comply with any other term, obligation, covenant or condition contained in this Deed of Trust, the Note or in any of the Related Documents.

Default on Other Payments. Failure of Grantor within the time required by this Deed of Trust to make any payment for taxes or insurance, or any other payment necessary to prevent filing of or to effect discharge of any lien.

Default in Favor of Third Parties. Should Borrower or any Grantor default under any loan, extension of credit, security agreement, purchase or sale agreement, or any other agreement, in favor of any other creditor or person that may materially affect any of Borrower's or any Grantor's property or Borrower's ability to repay the Indebtedness or Borrower's or Grantor's ability to perform their respective obligations under this Deed of Trust or any of the Related Documents.

False Statements. Any warranty, representation or statement made or furnished to Lender by Borrower or Grantor or on Borrower's or Grantor's behalf under this Deed of Trust or the Related Documents is false or misleading in any material respect, either now or at the time made or furnished or becomes false or misleading at any time thereafter.

Defective Collateralization. This Deed of Trust or any of the Related Documents ceases to be in full force and effect (including failure of any collateral document to create a valid and perfected security interest or lien) at any time and for any reason.

Insolvency. The dissolution or termination of the Trust, the insolvency of Borrower or Grantor, the appointment of a receiver for any part of Borrower's or Grantor's property, any assignment for the benefit of creditors, any type of creditor workout, or the commencement of any proceeding under any bankruptcy or insolvency laws by or against Borrower or Grantor.

Creditor or Forfeiture Proceedings. Commencement of foreclosure or forfeiture proceedings, whether by judicial proceeding, self-help, repossession or any other method, by any creditor of Borrower or Grantor or by any governmental agency against any property securing the Indebtedness. This includes a garnishment of any of Borrower's or Grantor's accounts, including deposit accounts, with Lender. However, this Event of Default shall not apply if there is a good faith dispute by Borrower or Grantor as to the validity or reasonableness of the claim which is the basis of the creditor or forfeiture proceeding and if Borrower or Grantor gives Lender written notice of the creditor or forfeiture proceeding and deposits with Lender monies or a surety bond for the creditor or forfeiture proceeding, in an amount determined by Lender, in its sole discretion, as being an adequate reserve or bond for the dispute.

Breach of Other Agreement. Any breach by Borrower or Grantor under the terms of any other agreement between Borrower or Grantor and Lender that is not remedied within any grace period provided therein, including without limitation any agreement concerning any indebtedness or other obligation of Borrower or Grantor to Lender, whether existing now or later.

Events Affecting Guarantor. Any of the preceding events occurs with respect to any guarantor, endorser, surety, or accommodation party of any of the Indebtedness or any guarantor, endorser, surety, or accommodation party dies or becomes incompetent, or revokes or disputes the validity of, or liability under, any Guaranty of the Indebtedness.

Adverse Change. A material adverse change occurs in Borrower's or Grantor's financial condition, or Lender believes the prospect of payment or performance of the Indebtedness is impaired.

Right to Cure. If any default, other than a default in payment is curable and if Grantor has not been given a notice of a breach of the same provision of this Deed of Trust within the preceding twelve (12) months, it may be cured if Grantor, after Lender sends written notice to Borrower demanding cure of such default: (1) cures the default within twenty (20) days; or (2) if the cure requires more than twenty (20) days, immediately initiates steps which Lender deems in Lender's sole discretion to be sufficient to cure the default and thereafter continues and completes all reasonable and necessary steps sufficient to produce compliance as soon as reasonably practical.

RIGHTS AND REMEDIES ON DEFAULT. If an Event of Default occurs under this Deed of Trust, at any time thereafter, Trustee or Lender may exercise any one or more of the following rights and remedies:

Election of Remedies. Election by Lender to pursue any remedy shall not exclude pursuit of any other remedy, and an election to make expenditures or to take action to perform an obligation of Grantor under this Deed of Trust, after Grantor's failure to perform, shall not affect Lender's right to declare a default and exercise its remedies.

Accelerate Indebtedness. Lender shall have the right at its option without notice to Borrower or Grantor to declare the entire Indebtedness immediately due and payable, including any prepayment penalty which Borrower would be required to pay.

Foreclosure. Lender shall have the right to cause all or any part of the Real Property, and Personal Property, if Lender decides to proceed against it as if it were real property, to be sold by the Trustee according to the laws of the State of Colorado as respects foreclosures against real property. The Trustee shall give notice in accordance with the laws of Colorado. The Trustee shall apply the proceeds of the sale in the following order: (a) to all costs and expenses of the sale, including but not limited to Trustee's fees, attorneys' fees, and the cost of title evidence; (b) to all sums secured by this Deed of Trust; and (c) the excess, if any, to the person or persons legally entitled to the excess.

UCC Remedies. With respect to all or any part of the Personal Property, Lender shall have all the rights and remedies of a

secured party under the Uniform Commercial Code.

Collect Rents. Lender shall have the right, without notice to Borrower or Grantor to take possession of and manage the Property and collect the Rents, including amounts past due and unpaid, and apply the net proceeds, over and above Lender's costs, against the Indebtedness. In furtherance of this right, Lender may require any tenant or other user of the Property to make payments of rent or use fees directly to Lender. If the Rents are collected by Lender, then Grantor irrevocably designates Lender as Grantor's attorney-in-fact to endorse instruments received in payment thereof in the name of Grantor and to negotiate the same and collect the proceeds. Payments by tenants or other users to Lender in response to Lender's demand shall satisfy the obligations for which the payments are made, whether or not any proper grounds for the demand existed. Lender may exercise its rights under this subparagraph either in person, by agent, or through a receiver.

Appoint Receiver. Lender shall have the right to have a receiver appointed to take possession of all or any part of the Property, with the power to protect and preserve the Property, to operate the Property preceding foreclosure or sale, and to collect the Rents from the Property and apply the proceeds, over and above the cost of the receivership, against the Indebtedness. The receiver may serve without bond if permitted by law. Lender's right to the appointment of a receiver shall exist whether or not the apparent value of the Property exceeds the Indebtedness by a substantial amount. Employment by Lender shall not disqualify a person from serving as a receiver. Receiver may be appointed by a court of competent jurisdiction upon ex parte application and without notice, notice being expressly waived.

Tenancy at Sufferance. If Grantor remains in possession of the Property after the Property is sold as provided above or Lender otherwise becomes entitled to possession of the Property upon default of Borrower or Grantor, Grantor shall become a tenant at sufferance of Lender or the purchaser of the Property and shall, at Lender's option, either (1) pay a reasonable rental for the use of the Property, or (2) vacate the Property immediately upon the demand of Lender.

Other Remedies. Trustee or Lender shall have any other right or remedy provided in this Deed of Trust or the Note or available at law or in equity.

Sale of the Property. In exercising its rights and remedies, Lender shall be free to designate on or before it files a notice of election and demand with the Trustee, that the Trustee sell all or any part of the Property together or separately, in one sale or by separate sales. Lender shall be entitled to bid at any public sale on all or any portion of the Property. Upon any sale of the Property, whether made under a power of sale granted in this Deed of Trust or pursuant to judicial proceedings, if the holder of the Note is a purchaser at such sale, it shall be entitled to use and apply all, or any portion of, the Indebtedness for or in settlement or payment of all, or any portion of, the purchase price of the Property purchased, and, in such case, this Deed of Trust, the Note, and any documents evidencing expenditures secured by this Deed of Trust shall be presented to the person conducting the sale in order that the amount of Indebtedness so used or applied may be credited thereon as having been paid.

Attorneys' Fees; Expenses. If Lender forecloses or institutes any suit or action to enforce any of the terms of this Deed of Trust, Lender shall be entitled to recover such sum as the court may adjudge reasonable as attorneys' fees at trial and upon any appeal. Whether or not any court action is involved, and to the extent not prohibited by law, all reasonable expenses Lender incurs that in Lender's opinion are necessary at any time for the protection of its interest or the enforcement of its rights shall become a part of the Indebtedness payable on demand and shall bear interest at the Note rate from the date of the expenditure until repaid. Expenses covered by this paragraph include, without limitation, however subject to any limits under applicable law, Lender's attorneys' fees whether or not there is a lawsuit, including attorneys' fees and expenses for bankruptcy proceedings (including efforts to modify or vacate any automatic stay or injunction), appeals, and any anticipated post-judgment collection services, the cost of searching records, obtaining title reports (including foreclosure reports), surveyors' reports, and appraisal fees, title insurance, and fees for the Trustee, to the extent permitted by applicable law. Grantor also will pay any court costs, in addition to all other sums provided by law.

Rights of Trustee. To the extent permitted by applicable law, Trustee shall have all of the rights and duties of Lender as set forth in this section.

NOTICES. Any notice required to be given under this Deed of Trust, including without limitation any notice of default and any notice of sale shall be given in writing, and shall be effective when actually delivered, when actually received by telefacsimile (unless otherwise required by law), when deposited with a nationally recognized overnight courier, or, if mailed, when deposited in the United States mail, as first class, certified or registered mail postage prepaid, directed to the addresses shown near the beginning of this Deed of Trust. All copies of notices of foreclosure from the holder of any lien which has priority over this Deed of Trust shall be sent to Lender's address, as shown near the beginning of this Deed of Trust. Any party may change its address for notices under this Deed of Trust by giving formal written notice to the other parties, specifying that the purpose of the notice is to change the party's address. For notice purposes, Grantor agrees to keep Lender informed at all times of Grantor's current address. Unless otherwise provided or required by law, if there is more than one Grantor, any notice given by Lender to any Grantor is deemed to be notice given to all Grantors.

MISCELLANEOUS PROVISIONS. The following miscellaneous provisions are a part of this Deed of Trust:

Amendments. This Deed of Trust, together with any Related Documents, constitutes the entire understanding and agreement of the parties as to the matters set forth in this Deed of Trust. No alteration of or amendment to this Deed of Trust shall be effective unless given in writing and signed by the party or parties sought to be charged or bound by the alteration or amendment.

Annual Reports. If the Property is used for purposes other than Grantor's residence, Grantor shall furnish to Lender, upon request, a certified statement of net operating income received from the Property during Grantor's previous fiscal year in such form and detail as Lender shall require. "Net operating income" shall mean all cash receipts from the Property less all cash expenditures made in connection with the operation of the Property.

Caption Headings. Caption headings in this Deed of Trust are for convenience purposes only and are not to be used to interpret or define the provisions of this Deed of Trust.

Merger. There shall be no merger of the interest or estate created by this Deed of Trust with any other interest or estate in the Property at any time held by or for the benefit of Lender in any capacity, without the written consent of Lender.

Governing Law. This Deed of Trust will be governed by federal law applicable to Lender and, to the extent not preempted by federal law, the laws of the State of Colorado without regard to its conflicts of law provisions. This Deed of Trust has been accepted by Lender in the State of Colorado.

Joint and Several Liability. All obligations of Borrower and Grantor under this Deed of Trust shall be joint and several, and all references to Grantor shall mean each and every Grantor, and all references to Borrower shall mean each and every Borrower. This means that each Grantor signing below is responsible for all obligations in this Deed of Trust.

No Waiver by Lender. Lender shall not be deemed to have waived any rights under this Deed of Trust unless such waiver is given in writing and signed by Lender. No delay or omission on the part of Lender in exercising any right shall operate as a waiver of such right or any other right. A waiver by Lender of a provision of this Deed of Trust shall not prejudice or constitute a waiver of Lender's right otherwise to demand strict compliance with that provision or any other provision of this Deed of Trust. No prior waiver by Lender, nor any course of dealing between Lender and Grantor, shall constitute a waiver of any of Lender's rights or of any of Grantor's obligations as to any future transactions. Whenever the consent of Lender is required under this Deed of Trust, the granting of such consent by Lender in any instance shall not constitute continuing consent to subsequent instances where such consent is required and in all cases such consent may be granted or withheld in the sole discretion of Lender.

Severability. If a court of competent jurisdiction finds any provision of this Deed of Trust to be illegal, invalid, or unenforceable as to any circumstance, that finding shall not make the offending provision illegal, invalid, or unenforceable as to any other circumstance. If feasible, the offending provision shall be considered modified so that it becomes legal, valid and enforceable. If the offending provision cannot be so modified, it shall be considered deleted from this Deed of Trust. Unless otherwise required by law, the illegality, invalidity, or unenforceability of any provision of this Deed of Trust shall not affect the legality, validity or enforceability of any other provision of this Deed of Trust.

Successors and Assigns. Subject to any limitations stated in this Deed of Trust on transfer of Grantor's interest, this Deed of Trust shall be binding upon and inure to the benefit of the parties, their successors and assigns. If ownership of the Property becomes vested in a person other than Grantor, Lender, without notice to Grantor, may deal with Grantor's successors with reference to this Deed of Trust and the Indebtedness by way of forbearance or extension without releasing Grantor from the obligations of this Deed of Trust or liability under the Indebtedness.

Time Is Of the Essence. Time is of the essence in the performance of this Deed of Trust.

Waive Jury. All parties to this Deed of Trust hereby waive the right to any jury trial in any action, proceeding, or counterclaim brought by any party against any other party.

Waiver of Homestead Exemption. Grantor hereby releases and waives all rights and benefits of the homestead exemption laws of the State of Colorado as to all Indebtedness secured by this Deed of Trust.

DEFINITIONS. The following capitalized words and terms shall have the following meanings when used in this Deed of Trust. Unless specifically stated to the contrary, all references to dollar amounts shall mean amounts in lawful money of the United States of America. Words and terms used in the singular shall include the plural, and the plural shall include the singular, as the context may require. Words and terms not otherwise defined in this Deed of Trust shall have the meanings attributed to such terms in the Uniform Commercial Code:

Beneficiary. The word "Beneficiary" means Farmers State Bank of Calhan, and its successors and assigns.

Borrower. The word "Borrower" means THE JLO TRUST U/T/A DATED AUGUST 1, 1991; DAYTON ORSBURN; and LEAH ORSBURN and includes all co-signers and co-makers signing the Note and all their successors and assigns.

Deed of Trust. The words "Deed of Trust" mean this Deed of Trust among Grantor, Lender, and Trustee, and includes without limitation all assignment and security interest provisions relating to the Personal Property and Rents.

Default. The word "Default" means the Default set forth in this Deed of Trust in the section titled "Default".

Environmental Laws. The words "Environmental Laws" mean any and all state, federal and local statutes, regulations and ordinances relating to the protection of human health or the environment, including without limitation the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. Section 9601, et seq. ("CERCLA"), the Superfund Amendments and Reauthorization Act of 1986, Pub. L. No. 99-499 ("SARA"), the Hazardous Materials Transportation Act, 49 U.S.C. Section 1801, et seq., the Resource Conservation and Recovery Act, 42 U.S.C. Section 6901, et seq., or other applicable state or federal laws, rules, or regulations adopted pursuant thereto.

Event of Default. The words "Event of Default" mean any of the events of default set forth in this Deed of Trust in the events of default section of this Deed of Trust.

Grantor. The word "Grantor" means THE JLO TRUST U/T/A DATED AUGUST 1, 1991.

Guaranty. The word "Guaranty" means the guaranty from guarantor, endorser, surety, or accommodation party to Lender, including without limitation a guaranty of all or part of the Note.

Hazardous Substances. The words "Hazardous Substances" mean materials that, because of their quantity, concentration or physical, chemical or infectious characteristics, may cause or pose a present or potential hazard to human health or the environment when improperly used, treated, stored, disposed of, generated, manufactured, transported or otherwise handled. The words "Hazardous Substances" are used in their very broadest sense and include without limitation any and all hazardous or toxic substances, materials or waste as defined by or listed under the Environmental Laws. The term "Hazardous Substances" also includes, without limitation, petroleum and petroleum by-products or any fraction thereof and asbestos.

Improvements. The word "Improvements" means all existing and future improvements, buildings, structures, mobile homes affixed on the Real Property, facilities, additions, replacements and other construction on the Real Property.

Indebtedness. The word "Indebtedness" means all principal, interest, and other amounts, costs and expenses payable under the Note or Related Documents, together with all renewals of, extensions of, modifications of, consolidations of and substitutions for the Note or Related Documents and any amounts expended or advanced by Lender to discharge Grantor's obligations or expenses incurred by Trustee or Lender to enforce Grantor's obligations under this Deed of Trust, together with interest on such amounts as provided in this Deed of Trust. However, "Indebtedness" shall not include any liabilities and obligations under any interest rate protection agreements or foreign currency exchange agreements or commodity price protection agreements, unless otherwise agreed in writing by Grantor and Lender.

Lender. The word "Lender" means Farmers State Bank of Calhan, its successors and assigns.

Note. The word "Note" means the promissory note dated August 5, 2013, **in the original principal amount of $101,987.00** from Borrower to Lender, together with all renewals of, extensions of, modifications of, refinancings of, consolidations of, and substitutions for the promissory note or agreement.

Personal Property. The words "Personal Property" mean all equipment, fixtures, and other articles of personal property now or hereafter owned by Grantor, and now or hereafter attached or affixed to the Real Property; together with all accessions, parts, and additions to, all replacements of, and all substitutions for, any of such property; and together with all proceeds (including without limitation all insurance proceeds and refunds of premiums) from any sale or other disposition of the Property.

Property. The word "Property" means collectively the Real Property and the Personal Property.

Real Property. The words "Real Property" mean the real property, interests and rights, as further described in this Deed of Trust.

Related Documents. The words "Related Documents" mean all promissory notes, credit agreements, loan agreements, environmental agreements, guaranties, security agreements, mortgages, deeds of trust, security deeds, collateral mortgages, and all other instruments, agreements and documents, whether now or hereafter existing, executed in connection with the Indebtedness.

Rents. The word "Rents" means all present and future rents, revenues, income, issues, royalties, profits, and other benefits derived from the Property.

Trustee. The word "Trustee" means the Public Trustee of ELPASO County, Colorado.

GRANTOR ACKNOWLEDGES HAVING READ ALL THE PROVISIONS OF THIS DEED OF TRUST, AND GRANTOR AGREES TO ITS TERMS.

GRANTOR:

THE JLO TRUST U/T/A DATED AUGUST 1, 1991

By: Trustee
DAYTON ORSBURN, Trustee of THE JLO TRUST U/T/A DATED AUGUST 1, 1991

By: Leah Orsburn, Trustee
LEAH ORSBURN, Trustee of THE JLO TRUST U/T/A DATED AUGUST 1, 1991

TRUST ACKNOWLEDGMENT

STATE OF California)
) SS
COUNTY OF San Bernardino)

On this 27th day of August, 20 13, before me, the undersigned Notary Public, personally appeared DAYTON ORSBURN, Trustee of THE JLO TRUST U/T/A DATED AUGUST 1, 1991 and LEAH ORSBURN, Trustee of THE JLO TRUST U/T/A DATED AUGUST 1, 1991, and known to me to be authorized trustees or agents of the trust that executed the Deed of Trust and acknowledged the Deed of Trust to be the free and voluntary act and deed of the trust, by authority set forth in the trust documents or, by authority of statute, for the uses and purposes therein mentioned, and on oath stated that they are authorized to execute this Deed of Trust and in fact executed the Deed of Trust on behalf of the trust.

By: Residing at Chino, California

Notary Public in and for the State of California My commission expires May 8th, 2014

ELIZABETH HARRINGTON
COMM. # 1888688
NOTARY PUBLIC - CALIFORNIA
SAN BERNARDINO COUNTY
My Comm. Expires May 8, 2014

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EXHIBIT I – SITE APPLICATION

ARROWHEAD MOBILE HOME PARK

LIFT STATION
22.7 SITE APPLICATION REPORT

ELEMENT ENGINEERING LLC

JUNE 2018

LIFT STATION
22.7 SITE APPLICATION REPORT
FOR
ARROWHEAD MOBILE HOME PARK

JUNE 2018

EE Job No.: 0013.0001

COLORADO LICENSED
NICHOLAUS P. MARCOTTE
47164
6/15/18
PROFESSIONAL ENGINEER

ELEMENT
ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

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DEFINITIONS, ACRONYMS, AND ABBREVIATIONS (NOT ALL MAY BE FOUND IN THIS REPORT)

BOD_5	5-Day Biochemical Oxygen Demand
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
cm/sec	Centimeters per second
CY	Cubic Yards
DOLA	Department of Local Affairs
EA	Each
EDU	Equivalent Dwelling Unit
ECHO	Enforcement and Compliance History Online
EE	Element Engineering, LLC
EPA	Environmental Protection Agency
ft	Feet
gal	gallons
gpcd	Gallons per capita-day
gpd	Gallons per day
gpm	Gallons per minute
hp	Horsepower
HVAC	Heating, Ventilating and Air Conditioning
I&I	Inflow and Infiltration
kW	Kilowatts
lb/ac-day	Pounds per acre-day
lb/day	Pounds per day
LF	Linear Feet
LS	Lump Sum
mg/L	Milligrams per Liter
MGD	Million Gallons per Day
N/A	Not available or applicable
O&M	Operations and Maintenance
OMB	Office of Management and Budget
PEL	Preliminary Effluent Limitations
PVC	Polyvinyl Chloride
PW	Present Worth
RAS	Return Activated Sludge
ref.	Reference
RUS	Rural Utilities Services
SCADA	Supervisory Control and Data Acquisition
SFE	Single Family Equivalent
SF	Square Feet
SOG	Slab on Grade
TSS	Total Suspended Solids
USDA	United States Department of Agriculture
VFD	Variable Frequency Drives
WAS	Waste Activated Sludge
WWTP	Wastewater Treatment Plant
YR	Year

1 INTRODUCTION

The existing Arrowhead Mobile Home Park (AMHP) Wastewater Treatment Plant (WWTP) consists of a two-cell aerated chamber system with a small settling chamber that discharges to a two-cell unlined lagoon that functions as an infiltration basin. The WWTP is currently in non-compliance because there is no state approved discharge permit allowing discharge to groundwater in this manner. Furthermore, the existing facility will not be capable of treating to stringent effluent groundwater nutrient limits. The proposed project includes the complete decommissioning of the existing AMHP WWTP and the construction of a lift station that will consolidate with the neighboring Cherokee Metropolitan District (CMD). As part of this project, AMHP has submitted all necessary paperwork to be officially included as an in-district customer of CMD.

The proposed lift station will be located on AMHP property, adjacent to the existing WWTP so that the existing collection system can be utilized. It will pump to CMD's gravity sewer main that runs along North Curtis Road. Once it joins with the CMD collection system, it will be treated at the Cherokee Metropolitan District Water Reclamation facility, which is comprised of the Black Squirrel WWTF and Rapid Infiltration Basin Facility and discharges to groundwater.

1.1 APPLICABLE REGULATORY SECTIONS

This *Site Application Engineering Report* will address the requirements set forth in Regulation 22, Section 7. The proposed project includes the construction of a new lift station. The CDPHE Regulation 22.7 Application Form and Completeness Checklist are provided in Appendix A.

This report is being simultaneously submitted to CDPHE with the Basis of Design Report and 100% Plans and Specifications. These documents will be reviewed by CDPHE and all comments received from the agency will be addressed prior to moving forward with construction.

In addition to the applicable sections of Regulation 22, the design and facility layout will comply with *State of Colorado Design Criteria for Domestic Wastewater Treatment Works*.

1.2 APPLICANT INFORMATION

Applicant:

Arrowhead Mobile Home Park
75 N. Curtis Road
Colorado Springs, CO 80930
(719) 683-2727

Representative:

Dayton and Leah Orsburn, Co-Trustees
Owner
(909) 576-1324

2 PROJECT BACKGROUND

2.1 PROJECT LOCATION AND SERVICE AREA

The Arrowhead Mobile Home Park (AMHP) is located in El Paso County, ten (10) miles east of Colorado Springs. It serves one office building, and 54 mobile homes housing approximately 135 residents based on an average of 2.5 persons per unit (see CDPHE Regulation 43). The service area is located in Section 15, Township 14S, Range 64W of the Sixth Prime Meridian. The service area is at complete build-out and cannot expand. No changes to the population, flow, or wastewater characteristics are expected. Photos depicting the approximate service area boundary and proposed project location are shown in Figure 1 and Figure 2, respectively. Ownership documentation and project area maps are attached in Appendix B.

Figure 1 – Service Area Boundary Map

Figure 2 - Proposed Project Location

2.1.1 Area Discharge Permits, Drinking Water Intakes, and Domestic Wells

The two water and wastewater districts in the area are Cherokee Metropolitan District and Colorado Centre Metropolitan District. There are no dischargers within a 5-mile radius. Water wells in a one-mile radius were located utilizing the Colorado Decision Support System maps. There are several wells within this one-mile radius. Locations of these wells are shown in the 1-Mile Radius Map in Appendix B.

2.1.2 Topography

A USGS topographical map for the project area is located in Appendix B. A full geotechnical analysis, as required by CDPHE design criteria, is being completed by Kumar and Associates. The findings of this report will be utilized to update the project design as required. The geotechnical analysis will be submitted to CDPHE upon receipt.

2.1.3 Local Water Bodies, Streams, and Rivers

The only water body in the area of the proposed project is the Big Springs Creek, located approximately eleven (11) miles to the east. No other water bodies exist in the vicinity of the project area.

2.1.4 Floodplains and Wetlands

The proposed lift station project area is not located within the 100-year floodplain. According to the Flood Insurance Rate Map (FIRM No. 08041C0800F) the project area is located outside of the 500-year floodplain. A map depicting the project location is included in Appendix B.

Furthermore, no wetlands exist in the area of the proposed project. A National Wetlands Inventory Map is attached in Appendix B.

2.1.5 Endangered Species

An Information for Planning and Consultation (IPaC) Resource List was compiled that catalogues all of the listed and proposed threatened and endangered species, and critical habitats found within the planning area. This report can be found in Appendix C. The IPaC report found 3 endangered species and 7 threatened species in the planning area. The project area does not coincide with any critical habitats. Furthermore, several species are listed as only needing to be considered if the project includes water-related activities in the North Platte, South Platte, and Laramie River Basins. The planning area does not overlap any of these basins; therefore, the proposed project is not expected to affect these listed species. No critical habitats were found at this location.

2.1.6 Land Use Projections and Zoning

No changes are expected with respect to land use designations or zoning over the course of the 20-year planning period.

2.2 POPULATION AND FLOW PROJECTIONS

The AMHP service area consists of 54 mobile homes housing approximately 135 residents and one office building. The service area is at complete buildout, and no more growth is possible. Therefore, the existing flow and loading is equivalent to future flow and loading. In late June 2017, a temporary flow recording device was installed on the effluent piping of the plant. Due to the layout and design of the influent piping, there is no possible way to install a flow monitor on the influent piping. The existing plant is very small; therefore, it is reasonably assumed that effluent flow is equal to influent flow. The flow data collected to date is summarized in Appendix D.

2.3 HYDRAULIC LOADING ANALYSIS

As shown in Appendix D, the existing average daily flow (ADF) from June 2017 through August 2017 is 5,100 gpd. Although irrigation does not occur in the service area, the data is too limited to use this as a representative value. This report will therefore utilize a conservative design ADF of 7,500 gpd for the proposed lift station. Because the service area population will not change over the 20-year planning period, this is the projected ADF as well.

Peak hour flow can be calculated using a peaking factor obtained from Figure 3.1 of CDPHE's Design Criteria. At an existing and future population of 135, an appropriate and conservative design peak hour flow to design average flow factor of 4.0 is used. Therefore, the peak hour flow for the replacement lift station is 30,000 gpd or approximately 20.8 gpm. Table 1 summarizes the hydraulic loading conditions at the lift station.

Table 1 – AMHP Lift Station Hydraulic Loading Conditions

Criteria	Value	Units
Average Daily Flow (ADF)	7,500	gpd
20-Year Projected Average Daily Flow	7,500	gpd
Peak Hour Flow (PHF)	30,000	gpd
Peak Hour Flow (PHF)	20.8	gpm
PHF = ADF x 4 (appropriate for service area size)		

Because the existing facility was not properly permitted, influent BOD monitoring has not been performed. In lieu of site-specific data, BOD loading can be estimated using design values found in *CDPHE Regulation 43 – On-Site Wastewater Treatment System Regulation*. According to Table 6-2 of this regulation, the estimated per capita BOD loading for mobile homes is 0.2 lbs per day. For office buildings, the estimated BOD loading contribution is 0.06 lbs per day per employee per 8-hour shift. The existing office building is run by one employee; therefore, the total daily BOD contribution from the office building is 0.06 lbs per day. Table 2 summarizes the calculated influent organic loading based on service area characteristics and Regulation 43 design values. Table 3 summarizes the organic loading conditions at the lift station.

Table 2 – Influent Organic Loading Calculations

User Type	Units	No. Units	lbs BOD/day per Unit	Total lbs BOD/day
Residential - Mobile Home	per Capita	135	0.2	27
Office	per Employee (8-Hour Work Day)	1	0.06	0.06
			Total	27.06
Source: Regulation 43, Assumes 2.5 persons per mobile home.				

Table 3 – AMHP Lift Station Organic Loading Conditions

Criteria	Value	Units
Estimated Annual Average Loading (AAL)	27.06	lbs/day
Influent BOD Concentration	432	mg/L
Peak Hour Organic Loading (PHOL)	108	lbs/day
PHOL = Projected AAL x 4 (appropriate for service area size) Influent BOD Concentration calculated from ADF and estimated AAL		

2.4 IDENTIFICATION OF TREATMENT ENTITY

All wastewater in the collection system is currently directed to the existing AMHP WWTP, which is a small

packaged activated sludge plant. The treatment process consists of two concrete aeration chambers, a clarifier, and a two-cell unlined lagoon that discharges directly to groundwater. This facility does not currently hold a state approved discharge permit to legally discharge effluent to groundwater in this manner.

The proposed project includes the complete decommissioning of the existing AMHP WWTP and the construction of a lift station that will pump raw wastewater to the Cherokee Metropolitan District Water Reclamation Facility for treatment. As part of this project, AMHP will submit all necessary paperwork to be officially included as an in-district customer of CMD.

The CMD Water Reclamation Facility is located at 19174 Drennan Road and consists of the Black Squirrel WWTF and Rapid Infiltration Basin Facility. The Black Squirrel WWTF is an extended aeration activated sludge biological process, utilizing four sequencing batch reactors (SBRs), followed by effluent flow equalization and UV disinfection. Waste activated sludge (WAS) is aerobically digested and dewatered with centrifuges. Treated effluent from the mechanical treatment facility is conveyed to the Rapid Infiltration Basin Facility, located approximately four (4) miles east. An aerial image of these facilities is shown in Figure 3. Detailed information on the Water Reclamation Facility, including the permit certification and process flow diagrams, can be found in Appendix E.

Figure 3 – Cherokee Metropolitan District Water Reclamation Facility Layout

2.5 PROJECT IMPACT TO TREATMENT ENTITY

Although the proposed project will increase the total flow and loading received by the CMD Water Reclamation Facility (WRF), wastewater contributions from AMHP will be insignificant in comparison to total flows. Based on existing data and calculated influent organic load, average contributions from AMHP will be approximately 7,500 gpd and 27.06 lbs of BOD/day. At a facility permitted to receive 4.8 MGD, this would only contribute approximately 0.1% of the permitted hydraulic capacity and 0.2% of the existing ADF. Similarly, AMHP would contribute 0.3% of the permitted organic loading of 8,835 lbs of BOD/day at CMD.

Furthermore, although the CMD WRF has persistently had problems meeting its permitted effluent Total

Dissolved Solids (TDS) limit of 400 mg/L, the wastewater contribution from AMHP are so insignificant that it will not affect the overall TDS concentration received by the CMD WRF. Per the CMD Water and Wastewater Collections Manager, CMD staff is confident that the anticipated and projected additional flows to be received will not materially alter the status of their current Compliance Order on Consent (COC), Number MC-140514-1. This COC is included in Appendix F along with correspondence with CMD.

2.6 LEGAL CONTROL OF SITE

The proposed lift station will be located on AMHP property, adjacent to the existing treatment plant. The force main will extend through county right of way and connect to the CMD gravity pipe located within the county right of way easement.

2.7 WASTEWATER TREATMENT ENTITY STATEMENT

The Wastewater Receiving Entity Certification has been filled out by CMD and is attached in Appendix A as page 6 of the Application Form. As part of this project, AMHP has submitted and received board approval for an Inclusion Petition in order to be considered an in-district customer of CMD. As an in-district customer, AMHP will pay lower sewer rates than it would've otherwise. A signed copy of CMD Resolution 2018-03 to include AMHP as an in-district customer, along with all supporting documentation, is included in Appendix E.

3 PROJECT DESIGN CONSIDERATIONS

The proposed Arrowhead Mobile Home Park Lift Station will consist of the installation of a 4-ft diameter packaged lift station, and a 4-ft diameter meter vault adjacent to the location of the existing lift station. This also includes the installation of two submersible grinder pumps rated at 35 gpm at 54.80 ft of total dynamic head, along with all required electrical controls. Although the pumps are rated higher than the PHF of 21 gpm, the pumping rates must exceed the PHF in order to maintain velocities of greater than 2 fps in the 2" force main. At 35 gpm, pipe velocity will be approximately 3.58 fps.

Locating the proposed lift station adjacent to the existing AMHP WWTF will allow as much of the existing collection system piping to be utilized as possible.

The proposed lift station will be designed in accordance with *Colorado Design Criteria for Domestic Wastewater Treatment Works, Chapter 4.* The design criteria for the proposed lift station are as follows:

- Two grinder pumps rated at 35 gpm at 54.80 ft TDH
- Variable frequency drives
- 4-ft diameter wet well
- A maximum of 1-hour wet-well detention time at average day flow conditions
- Minimum velocity in the force main shall be greater than 2 fps
- Emergency storage for 2-hours of peak hour flow conditions in the emergency overflow manhole
- Flow monitoring will be achieved by installing a magmeter on the force main

4 EMERGENCY OPERATIONS AND MAINTENANCE

4.1 EMERGENCY OPERATIONS PLAN

The main goals of an emergency operations and maintenance plan for a lift station are to 1) prevent sanitary sewer overflows (SSOs) through routine maintenance, and 2) to clearly establish the procedure to follow in the event that an SSO does occur. A preliminary emergency response plan has been developed as part of this site application and details the following:

- Identification of Potential Causes of Overflow
- Prevention Practices
- Engineering Features to Address Sanitary Sewer Overflows
- Emergency Preparedness

The AMHP staff will operate the proposed lift station. All emergency response procedures will be handled by AMHP staff in conjunction with Cherokee Metropolitan District staff and practices.

4.1.1 Identification of Potential Causes of Overflow

The lift station will be equipped with pump failure and high wet well alarms and an auto-dialer that will alert operations staff to equipment failures and/or high wet well levels. Pumping equipment will include overcurrent and high temperature protection. In addition to the auto-dialer, an audible alarm and a visual alarm light will activate to alert and draw attention in the surrounding area. AMHP has dedicated 24-hour on-call staffing that will quickly respond to emergencies or alarms.

4.1.2 Prevention Practices

Routine operation and maintenance checks are essential to prevent overflows from a lift station. It is recommended that the lift station be inspected on a daily basis. This would simply include opening the wet well, meter vault, and control panels to inspect for damage or any potential sources of clogging.

Alarm testing will be completed on a monthly basis upon startup of the lift station to ensure alarms are functioning properly. Valves in the wet well should be exercised once per quarter to ensure they will work when needed.

Routine pump maintenance as described by the pump manufacturer will be included in the operation and maintenance manual turned over to the owner at the completion of construction.

4.1.3 Engineering Features to Address Sanitary Sewer Overflows

Two (2) pumps will be provided to ensure redundancy. During normal operation, each pump will operate in a lead-lag fashion. Each pump will be capable of pumping 100% of the peak hour flow individually.

Emergency storage, as required in the design criteria, will be provided by an overflow manhole to ensure there is adequate time for staff to respond and fix any issues. This emergency storage will

also allow room for a portable pump to be utilized if there are issues with the two permanent grinder pumps.

As previously mentioned, an alarm system will be included for the pumps. Alarms will include pump failure, high wet-well level, and grinder failure. Alarms will be visual, audible, and will be sent to AMHP staff by auto-dialer.

4.1.4 Emergency Preparedness

If an SSO occurs, the emergency preparedness and response plan of AMHP staff is essential. The design criteria requires that overflow storage of raw wastewater be provided at the lift station in the event of an extended power outage, electrical failure, or mechanical failure, including force main interruptions. The overflow storage volume required must be sufficient to contain all wastewater during the period of time required to restore pump station operation, install temporary pumping capacity, or haul raw wastewater to an acceptable point of discharge. The overflow storage will be designed to contain two-hours of peak hour storage, or 2,500 gallons (21 gpm x 120 minutes). The wet well is also required to provide a maximum of one hour of detention time at average flows.

AMHP staff will assess each emergency event and respond accordingly. For example, in the case of a complete mechanical failure of all equipment, a portable pump will be installed temporarily to pump wastewater from the wet well to a camlock fitting in the valve vault to pump directly into the force main. In the event of a power outage or other electrical failure, a portable backup generator will be connected to provide temporary power.

4.2 TELEMETRY AND ALARMS

The lift station will feature an alarm system for the pumps. Alarms will include pump failure and high wet well level. Alarms will be visible, audible, and will be sent to AMHP staff by auto-dialer. Pumps will also include overcurrent and high temperature protection.

4.3 BACKUP POWER SUPPLY

To accommodate portable backup power, a portable generator quick-connect will be installed at the control panel.

4.4 PORTABLE EMERGENCY PUMPING EQUIPMENT

AMHP has access to portable pumps and generators that will be made available as needed in the event of a mechanical or electrical failure.

4.5 EMERGENCY STORAGE/OVERFLOW PROTECTION

An emergency overflow structure is included in the design. This structure will allow AMHP staff to respond to an emergency and take corrective action prior to an SSO.

4.6 OPERATOR CALL-DOWN LIST AND RESPONSE TIME JUSTIFICATION

The emergency phone number list includes emergency responders and AMHP personnel. The main point of contact would be (719) 589-5807 which is Colorado State Patrol (CSP) Dispatch. CSP then contacts AMHP personnel (24/7). The average response time is about 30 minutes after personnel receive the call from dispatch. The call-down list provided by AMHP is as follows:

EMERGENCY PHONE NUMBERS
ARROWHEAD MOBILE HOME PARK

Operator in Responsible Charge – Paul E. Grant II, Contract Operator
(719) 303-0411

Park Manager – Rhonda Folden
(719) 683-2727

Colorado State Patrol Dispatch
(719) 589-5807

El Paso County Sheriff
911 or (719) 520-7100

El Paso County Fire Marshal
911 or (719) 575-8590

WQCD 24HR Incident Report Line
1-877-518-5608

5 MANAGEMENT AND FINANCIAL CAPACITY

5.1 MANAGEMENT CAPACITY

AMHP owns and maintains the collection lines that are on park property, while CMD owns, manages, operates and maintains the off-park property sewer lines leading to the Water Reclamation Facility and the Water Reclamation Facility itself. AMHP will own, operate, and maintain the proposed lift station and force main up to the point where it connects to the CMD collection system. There is no need for additional park staff as the proposed project will reduce the operational intensity required by AMHP. Furthermore, there is no need for additional staff at CMD as a result of the proposed project because the increase to plant capacity is only 0.1% of CMD's permitted hydraulic capacity and 0.2% of the existing ADF seen by CMD's Water Reclamation Facility.

5.2 FINANCIAL CAPACITY

This project is being undertaken by the park owner and will be entirely privately funded. The owner is willing to increase lot rent fees as necessary to support this project. Operation and maintenance costs are expected to decrease with the installation of the new lift station. No increased staffing will be required with the new installation.

5.2.1 Capital Improvement Plan

The construction of a new lift station allows AMHP to consolidate with the nearest wastewater district, which is the most economically feasible means of bringing the park into regulatory compliance. Following completion of this project, no additional capital improvement projects should be necessary for the wastewater system for many years.

AMHP has had no major issues with or breaks in the pipe in their collection system. Annual inspection and maintenance will be necessary for the collection system to remain in good condition, and to address any emerging issues before they negatively impact system performance.

5.2.1 Rate Structure

AMHP residents do not pay individual usage-based water bills, but instead pay a flat-rate monthly lot fee that accounts for rent as well as utilities. The park owner is willing to adjust lot fees as necessary to support this project.

6 POSTING OF SITE & LOCAL AGENCY REVIEW

6.1 POSTING OF SITE

As required by Regulation 22, notice has been posted at the proposed site. A photo of the posted site is presented in Figure 4.

Figure 4 – Photo of Posted Notice

6.2 LOCAL AGENCY REVIEW

Regulation 22, Section 7 requires that a copy of the site location application and all supporting and ancillary documentation be submitted to the local review and commenting agencies prior to submission to CDPHE. The applicable agencies for this project are:

- County: El Paso County
- Health Department: El Paso County Department of Health and Environment
- 208/COG, RCOG: Pikes Peak Area Council of Governments

Transmittals showing distribution of this site application document are attached in Appendix G. Comments by the local agency reviewers will be submitted to CDPHE upon receipt.

7 CONSISTENCY WITH WATER QUALITY MANAGEMENT PLAN

The proposed project includes the construction of a new lift station and approximately 850 feet of force main, as well as the decommissioning of an unpermitted, unlined lagoon. This project will provide wastewater disposal without vector nuisances and will eliminate untreated discharges to groundwater, which is consistent with Colorado's Statewide Water Quality Management Plan. Furthermore, this project aligns with Objective 10.1 of the El Paso County 2004 Highway 94 Comprehensive Master Plan that encourages the consolidation of regional water and sanitation systems over the proliferation of small, individual systems. This project is also consistent with Section 3.6 of the Pikes Peak Area Council of Governments Water Quality Management Plan 2010 Update regarding the adequate collection, treatment, and disposal of wastewater.

8 IMPLEMENTATION SCHEDULE

A possible implementation schedule for the proposed project is shown in Table 4. Note that this schedule is preliminary and is subject to change.

Table 4 – Preliminary Project Schedule

Task	Start Date	End Date
Complete and Submit 22.7 Site Application to CDPHE	--	06/15/18
CDPHE Review and Approval of Site Application	06/15/18	09/15/18
Complete and Submit Basis of Design Report, 100% Plans and Specs to CDPHE	06/15/18	10/15/18
CDPHE Review and Approval of Basis of Design Report, 100% Plans and Specs	10/15/18	01/15/19
Project Bidding	01/15/19	02/15/19

APPENDIX A – REGULATION 22.7 APPLICATION FORM
REGULATION 22.7 APPLICATION COMPLETENESS CHECKLIST

Colorado Department of Public Health and Environment

Water Quality Control Division
Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Regulation 22 Application Form
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information			
System Name	Arrowhead Mobile Home Park		
Project Title	Arrowhead Mobile Home Park Lift Station		
County	El Paso		
Date Fee Paid or payment attached		Invoice Number and Check Number	
Design Company Name	Element Engineering, LLC		
Design Engineer	Nicholaus Marcotte	CO License Number	47164
Address	12687 West Cedar Drive, Suite 300		
	Lakewood, CO 80228		
Email	nmarcotte@elementengineering.net		
Phone	(303) 378-2969	Fax	
Applicant / Entity	Arrowhead Mobile Home Park		
Representative Name/Title	Orsburn, Dayton and Leah CO-Trustees		
Address	P.O. Box 154		
	Chino Hills, CA 91709		
Email	daytonorsburn@me.com		
Phone	(909) 576-1324	Fax	

B. Project Information			
Location (existing or proposed site)		***Proposed Project Capacity***	
Brief location description	75 N. Curtis Rd, Colorado Springs, CO 80930	Maximum Month Average Hydraulic Capacity in million gallons per day (MGD)	0.0051 MGD
Legal Description (e.g., Township, Range)	S2SW4NW4	Peak Hour Hydraulic Capacity in million gallons per day (MGD)	0.0204 MGD
County	El Paso		
Latitude	38°49'56.46" N	Organic Capacity (lbs. BOD_5/day) – Treatment Facility Only	8,835 lbs. BOD_5/day
Longitude	-104°33'06.08" W		

Funding Process	Will a State or Federal grant or loan be sought to finance any portion of the project (e.g., State Revolving Fund)?	No	☒	Yes	☐	If yes, please list project number

Project Schedule and Cost Estimate	
Estimated Bid Opening Date	1/15/19
Estimated Completion Date	7/31/19
Estimated Project Cost	$272,000

Regulation 22 Application Form
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
Project Title	Arrowhead Mobile Home Park Lift Station
System Name	Arrowhead Mobile Home Park
County	El Paso

Interceptor/Lift Station Design Information	
1.	a) Name and address of wastewater treatment facility providing treatment (Receiving wastewater facility must fill out "Receiving Wastewater Entity Certification")
	Cherokee Metropolitan District Water Reclamation Facility, 19174 Drennan Rd, Colorado Springs, CO 80930

Site Information	
2.	**Vicinity maps of facility location which includes the following:** a) 1 mile radius map: habitable buildings, location of public and private potable water wells, an approximate indication of the topography, and neighboring land uses
	See Site Application Appendices
3.	***Site Location Zoning***
	a) Present zoning of the site location?
	b) Zoning within a one (1) mile radius of the site? For New Lift Stations Only.
4.	**Floodplain or Natural Hazards**
	a) Is the facility located in a 100-year floodplain or other natural hazard area? If so, what precautions are being taken?
	No, N/A
	b) Has the floodplain been designated by the Colorado Water Conservation Board, Department of Natural Resources or other agency? If so, please list agency name and the designation.
	N/A
5.	**Land Ownership**
	a) Who owns the land upon which the facility will be constructed? Please attach copies of the document(s) creating authority for the applicant to construct the proposed facility at this site.
	Dayton and Leah Orsburn, Co-Trustees. See Appendix B.

Lift Station Facility Only	
6.	Please describe the period during which service area build-out will occur.
	The service area is already at full build-out and cannot expand.
7.	Please describe the flows expected in the first five years and ten years of operation.
	Future flows are equal to existing flows due to the service area being at full build-out. Average Day Flows are 7,500 gpd.
8.	Will the proposed lift station replace an existing lift station?
	Yes ☐ No ☒
	If Yes, please describe the current flows and loadings that will be switched to the proposed lift station.

9.	Describe emergency back-up system in case of lift station and/or power failure.
	See Section 4 of the Site Application
Project Information	
10.	a) What entity is financially responsible for the construction of the facility?
	Dayton and Leah Orsburn, Co-Trustees
11.	a) What entity has the financially responsibility for owning and long term operating expense of the proposed facility?
	Dayton and Leah Orsburn, Co-Trustees
12.	a) What entity has the responsibility for managing and operating the proposed facility after construction?
	Dayton and Leah Orsburn, Co-Trustees
Additional Factors	
13.	Please identify any additional factors that might help the Water Quality Control Division make an informed decision on your site location application.

Colorado Department of Public Health and Environment

Water Quality Control Division
Engineering Section

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CDPHE.WQEngReview@state.co.us
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Applicant Certification and Review Agencies Recommendation
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information	
System Name	Arrowhead Mobile Home Park
Project Title	Arrowhead Mobile Home Park Lift Station
County	El Paso

1. Applicant Certification

I certify that I am familiar with the requirement of *Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works*, and have posted the site in accordance with the Regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

Applicant Legal Representative (e.g. Public Works Director)	Date	Typed Name	Signature
Owner	6/13/18	Dayton Orsburn	

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Consulting Engineer is not the legal representative and cannot sign this form.

2. Recommendation of Review Agencies

As required in Section 22.7(2 and 3), the application and the engineering report must be submitted to all appropriate local governments, 208 planning agencies and State agencies for review and comment prior to submittal to the Division. By signing below, the entity or agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed site location application and may elect to provide comments, and 3) has provided a recommendation to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and any adopted water quality management plans(s). *Please note: If a governmental authority does not recommend approval then the authority must attached a letter describing the reason for their decision or comment on the next page.*

Signature of County, if proposed facility is located in unincorporated areas of a county							
Role	Date	Typed Name / Agency	Signature				
		El Paso County	Recommend Approval?	Yes	☐	No	☐
Signature of City or Town, if site is located within three miles of the City/Town boundary							
Role	Date	Typed Name / Agency	Signature				
			Recommend Approval?	Yes	☐	No	☐
Signature of Local Health Authority							
Role	Date	Typed Name / Agency	Signature				
		El Paso County Department of Health & Environment	Recommend Approval?	Yes	☐	No	☐
Signature of 208 Planning Agency							
Role	Date	Typed Name / Agency	Signature				
		Pike's Peak Area Council of Local Governments	Recommend Approval?	Yes	☐	No	☐

Colorado Department of Public Health and Environment

Water Quality Control Division
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Applicant Certification and Review Agencies Recommendation
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information	
System Name	Arrowhead Mobile Home Park
Project Title	Arrowhead Mobile Home Park Lift Station
County	El Paso

1. Applicant Certification

I certify that I am familiar with the requirement of *Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works*, and have posted the site in accordance with the Regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

Applicant Legal Representative (e.g. Public Works Director)	Date	Typed Name	Signature
Owner	6/12/18	Dayton Orsburn	

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Consulting Engineer is not the legal representative and cannot sign this form.

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As required in Section 22.7(2 and 3), the application and the engineering report must be submitted to all appropriate local governments, 208 planning agencies and State agencies for review and comment prior to submittal to the Division. By signing below, the entity or agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed site location application and may elect to provide comments, and 3) has provided a recommendation to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and any adopted water quality management plans(s). *Please note: If a governmental authority does not recommend approval then the authority must attached a letter describing the reason for their decision or comment on the next page.*

Signature of County, if proposed facility is located in unincorporated areas of a county

Role	Date	Typed Name / Agency	Signature				
		El Paso County	Recommend Approval?	Yes	☐	No	☐

Signature of City or Town, if site is located within three miles of the City/Town boundary

Role	Date	Typed Name / Agency	Signature				
			Recommend Approval?	Yes	☐	No	☐

Signature of Local Health Authority

Role	Date	Typed Name / Agency	Signature				
EH Manager	8-13-18	El Paso County Department of Health & Environment	Recommend Approval?	Yes	☒	No	☐

Signature of 208 Planning Agency

Role	Date	Typed Name / Agency	Signature				
CHAIR	8/8/18	Pike's Peak Area Council of Local Governments	Recommend Approval?	Yes	☒	No	☐

Signature of Other State or Federal Agencies, if facility is located on or adjacent to a site that is owned or managed by a federal or state agency.			
Role	**Date**	**Typed Name / Agency**	**Signature**
			Recommend Approval? Yes ☐ No ☐

Signature of Other Basin Water Quality Authority, Watershed Association, Watershed Authority, etc., if facility is located in a Water Quality Control Commission Watershed Protection Control Area.			
Role	**Date**	**Typed Name / Agency**	**Signature**
			Recommend Approval? Yes ☐ No ☐

Review Agency Comments:

THE PPACG BOARD OF DIRECTORS (BY RECOMMENDATION FROM ITS WATER QUALITY MANAGEMENT COMMITTEE) RECOMMEND THAT APPROVAL BY THE STATE, AND IMPLEMENTATION OF THIS PROJECT, OCCUR AS EXPEDITIOUSLY AS POSSIBLE.

Signature of Other State or Federal Agencies, if facility is located on or adjacent to a site that is owned or managed by a federal or state agency.							
Role	**Date**	**Typed Name / Agency**	**Signature**				
			Recommend Approval?	***Yes***	☐	***No***	☐

Signature of Other Basin Water Quality Authority, Watershed Association, Watershed Authority, etc., if facility is located in a Water Quality Control Commission Watershed Protection Control Area.							
Role	**Date**	**Typed Name / Agency**	**Signature**				
			Recommend Approval?	***Yes***	☐	***No***	☐

Review Agency Comments:

Colorado Department of Public Health and Environment

Water Quality Control Division
Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Wastewater Receiving Entity Certification
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
System Name	Arrowhead Mobile Home Park
Project Title	Arrowhead Movile Home Park Lift Station
County	El Paso

Receiving Wastewater Entity – Certification of Available Treatment Capacity

Receiving wastewater treatment entity information			
Receiving wastewater treatment entity and facility	Cherokee Metropolitan District Water Reclamation Facility		
County	El paso		
CDPS discharge permit number and expiration date	COX048348	CDPS discharge permit capacity	4.8 MGD
Site location approval number and date (please attach a copy of approval letter)	SA4823, 8/25/2006	Site location approved capacity	4.8 MGD

Proposed facility capacity impacts on receiving wastewater treatment facility (projected at buildout or 20-years)	
Proposed project hydraulic capacity: maximum month average	0.0075 million gallons per day
Proposed project hydraulic capacity: peak hour	0.03 million gallons per day
Proposed project organic capacity: maximum month average	27.06 lbs BOD_5/day
Proposed project will increase the receiving treatment facility's hydraulic loading capacity to (% of total capacity):	36.4%
Proposed project will increase the receiving treatment facility's organic loading capacity to (% of total capacity):	43.5%

Treatment Certification (22.7 (1)(f) (i))

I certify that the receiving wastewater treatment facility will treat the wastewater from the proposed wastewater facility project.

Yes, will provide treatment	☒	No, will not provide treatment	☐

Capacity Certification (22.7 (1)(f) (ii))

I certify that the receiving wastewater treatment facility is not presently receiving wastes (hydraulic and organic loads) in excess of the above listed site location approval and discharge permit to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box).	MP
OR	
I certify that the receiving wastewater treatment facility does not currently have the capacity to serve the proposed project flows but is under construction, or will be in a phased construction of new or expanded facilities and will have the necessary capacity to treat the projected discharge from the new interceptor sewer or from the new or expanded lift station, as listed above (initial in box).	
Estimated date capacity will be available	

Note: Projections of flow and loading to the treatment facility over the period during which build out of the service area will occur or twenty years, whichever is less, as well as current and future plant capacity information must be provided to demonstrate the plan for maintaining adequate treatment capacity. Any proposed treatment plant phased construction must be shown in the Water Quality Management Plan (reference, attach), or by appropriate planning and engineering studies (reference, attach).

Compliance Status Certification (22.7 (1)(f) (iii))

I certify that the receiving wastewater treatment facility has not been in violation of any effluent limitations in its discharge permit for the last two years (initial in box).	
I certify that the receiving wastewater treatment facility is not operating under a Notice of Violation and/or Cease and Desist Order from the Division resulting from discharge permit violations (initial in box).	

Note: If there have been effluent violations or if the receiving wastewater treatment facility is operating under a Notice of Violation and/or Cease and Desist Order from the Division, please provide additional description of the situation and the treatment entity's proposed corrective measures to achieve consistent compliance. The Division will evaluate information provided and determine if approval should be granted, granted with conditions, or denied.

I hereby certify that the information presented above is accurate and complete.

Receiving Treatment Facility Representative	Date	Typed Name and Title	Signature
Michael Poeckes, ORC	6/14/18	Michael Poeckes, ORC	Michael J. Poeckes

Colorado Department of Public Health and Environment

Water Quality Control Division
Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Regulation 22 Completeness Checklist
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

Project and System Information	
Project Title	GArrowhead Mobile Home Park Lift Station
System Name	Arrowhead Mobile Home Park
County	El Paso

Regulation 22 Citation	Submittal Requirements		Included/Addressed in Site Location Submittal? Yes/No/NA	Location in Submittal (page)
22.7(1)	Site Application Forms including: - Signature of local authorities and 208 planning agency (see 22.7(2) and 22.7(3)) - Signature of responsible party of the proposed facility			
22.7 (1)	Engineering Report including			
	22.7 (1)(a)	Name and Address of Applicant	Y	Sec 1.2
	22.7 (1)(b)	A map identifying the proposed facilities site including area topography, and neighboring land uses	Y	Appx B
	22.7 (1)(c)	Service Area including:		
		- Existing and project population	Y	Sec 2.1
		- 20 year flow/loading projections	Y	Sec 2.2
	22.7 (1)(d)	Identification of the treatment entity responsible for receiving and treating the wastewater	Y	Sec 2.4
	22.7 (1)(e)	Control of site or right of way legal arrangements for project life	Y	Sec 2.6
	22.7 (1)(f)	Written confirmation that the receiving wastewater treatment entity (use form page	Y	Sec 2.7
	22.7 (1)(g)	Evidence that the facility will be properly operated and maintained	Y	Appx A
	22.7 (1)(h)	Management capabilities for controlling the wastewater loading within the capacity limitation of the proposed facility (e.g., user contracts, operating agreements)	Y	Sec 2.5
	22.7 (1)(i)	Financial system which has been developed to provide for necessary capital, O&M, and replacement cost through the life of the project. This would include:		
		- Anticipated annual budget	N/A	
		- Fee and rate structure	Y	Sec 5.2.1
	22.7 (1)(j)	Demonstration of the owner's capacity to operate and maintain the facility including		
		- Emergency operations plan	Y	Sec 4.1
	22.7 (1)(k)	Implementation plan and schedule, including:		
		- Estimated construction time	Y	Sec 8
		- Estimated start up date	Y	Sec 8
	22.7 (1)(l)	Site Location Posting Documentation (e.g., photo of the public notification sign) – For New Lift Stations Only	Y	Sec 6.1
22.7 (2-3)	Site Application Review and Comments from: (a) County (b) City or Town (c) Local Health (d) 208 Planning Agency (e) Other state or federal agencies		Y	Sec 6.2, Appx G

APPENDIX B – OWNERSHIP DOCUMENTATION
PROJECT MAPS

12 February 2018

Legal Description

A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89˚46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

Thence the following four (4) courses:

1. Along said east right-of way line of Curtis Road N00˚15'10"W a distance of 656.56 feet to intersect the north line of the aforesaid parcel.
2. Along the north line of said parcel N89˚07'42"E a distance of 10.00 feet to intersect a line drawn parallel to and 40.00 feet east of the west line of said Section 15.
3. Along said parallel line S00˚15'10"E a distance of 656.39 feet to intersect the south line of the aforesaid parcel.
4. Along said south line S89˚52'39"W a distance of 10.00 feet to the Point of Beginning.

Cameron Forth,
Colorado Professional Land Surveyor, #38390

Arrowhead Mobile Home Park
Property Owner Information

VICINITY MAP

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 350
LAKEWOOD, CO 80228
303.378.2969
WWW.ELEMENTENGINEERING.NET

DATE
AUGUST 2017

JOB NUMBER
0013.0001

SCALE
1" = 2,000'

Arrowhead Mobile Home Park
Area Dischargers - NPDES Permitted Facilities

CDSS
Colorado's Decision Support Systems

Map Viewer

Legend

- Well Constructed
- Permit Issued; Completion Sta
- County

Location

Notes

2 0 1 2 Miles

1: 63,360

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 6/28/2017 9:02:06 AM

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

CORRAL BLUFFS QUADRANGLE
COLORADO-EL PASO CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)
SE/4 FALCON 15' QUADRANGLE

Mapped, edited, and published by the Geological Survey in cooperation with U.S. Corps of Engineers

Control by USGS and USC&GS

Topography by photogrammetric methods from aerial photographs taken 1947. Field checked 1948
Revised from aerial photographs taken 1960. Field checked 1961

Polyconic projection. 1927 North American datum
10,000-foot grid based on Colorado coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks, zone 13, shown in blue

Fine red dashed lines indicate selected fence and field lines where generally visible on aerial photographs. This information is unchecked

TRUE NORTH
MAGNETIC NORTH
14°
APPROXIMATE MEAN DECLINATION, 1961

SCALE 1:24 000
1 ½ 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 .5 0 1 KILOMETER
CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER 25, COLORADO OR WASHINGTON 25, D.C.
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

COLORADO
QUADRANGLE LOCATION

ROAD CLASSIFICATION
Medium-duty — Light-duty
Unimproved dirt
State Route

CORRAL BLUFFS, COLO.
SE/4 FALCON 15' QUADRANGLE
N3845—W10430/7.5
1961

INTERIOR—GEOLOGICAL SURVEY, WASHINGTON, D.C.—1963
MR 5809

U. S. GOVT DOCUMENTS
APR 10 '64
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APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 800 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0800	F

MAP NUMBER 08041C0800 F

EFFECTIVE DATE: MARCH 17, 1997

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

U.S. Fish and Wildlife Service

National Wetlands Inventory

AMHP

June 27, 2017

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

APPENDIX C – INFORMATION FOR PLANNING AND CONSULTATION REPORT

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

El Paso County, Colorado

Local office

Colorado Ecological Services Field Office

(303) 236-4773
(303) 236-4005

MAILING ADDRESS

Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486

PHYSICAL ADDRESS

134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

http://www.fws.gov/coloradoES
http://www.fws.gov/platteriver

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

North American Wolverine Gulo gulo luscus — Proposed Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/5123

Preble's Meadow Jumping Mouse Zapus hudsonius preblei — Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/4090

Birds

NAME	STATUS
Least Tern Sterna antillarum	Endangered
Mexican Spotted Owl Strix occidentalis lucida	Threatened
Piping Plover Charadrius melodus	Threatened
Whooping Crane Grus americana	Endangered

Least Tern

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.

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8505

Mexican Spotted Owl

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/8196

Piping Plover

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.

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/6039

Whooping Crane

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.

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/758

Fishes

NAME	STATUS

NOT FOR CONSULTATION

Greenback Cutthroat Trout Oncorhynchus clarkii stomias — Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2775

Pallid Sturgeon Scaphirhynchus albus — Endangered

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.

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses Spiranthes diluvialis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2159	Threatened
Western Prairie Fringed Orchid Platanthera praeclara 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. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669	Threatened

NOT FOR CONSULTATION

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.

2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the counties which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

NOT FOR CONSULTATION

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable that the bird breeds in your project's counties at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the BGEPA should such impacts occur.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

NOT FOR CONSULTATION

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

APPENDIX D – INFLUENT FLOW DATA

Date	Total Flow (gpd)
6/28	8316
6/29	8447
6/30	7038
7/1	5648
7/2	5267
7/3	4524
7/4	4844
7/5	4838
7/6	4289
7/7	6065
7/8	6321
7/9	7957
7/10	6804
7/11	6405
7/12	5123
7/13	5357
7/14	4339
7/15	5313
7/16	5244
7/17	4842
7/18	4639
7/19	3968
7/20	4556
7/21	3749
7/22	4150
7/23	4870
7/24	4473
7/25	3718
7/26	5484
7/27	4465
7/28	3959
7/29	3504
7/30	3908
7/31	4586
8/1	3491
8/2	3972
8/3	3704
8/4	4361
8/5	4596
8/6	5466
8/7	4772
Average	**5057.85**

APPENDIX E – PERMIT CERTIFICATION NO. COX048348
SITE APPROVAL NO. 4823
SIGNED INCLUSION PETITION

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COLORADO DISCHARGE PERMIT SYSTEM (CDPS)
FACT SHEET FOR PERMIT NUMBER COX-048348

CHEROKEE METROPOLITAN DISTRICT
WATER RECLAMATION FACILITY

EL PASO COUNTY, COLORADO

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I. TYPE OF PERMIT — Domestic Major, New Groundwater-State Permitting Program Only

II. FACILITY INFORMATION

A. Facility Type: Domestic - Major Municipal, Mechanical Plant
Fee Category: Domestic Wastewater - Mechanical Plant, Category 21, Subcategory 7
Category Flow Range: Sewage from 2,500,000 up to 9,999,999 gpd
Annual Fee: $11,410 effective July 1, 2007

B. SIC Code: 4952 Sewerage Systems
Facility Classification: Class A per Section 100.5.2 of the Water and Wastewater Facility Operator Certification Requirements

C. Legal Contact/Permittee: Cherokee Metropolitan District
Kevin I. Petersen, General Manager
6250 Palmer Park Blvd., Colorado Springs, CO 80915-1721
719-597-5080

Facility Contact: Pete Heidebrecht, Certified Operator
719-597-5080, e-mail "pheidebrecht@cherokeemetro.org."

Facility Location: 19174 Drennan Rd., Colorado Springs, CO 80930;
WWTF Latitude: 38° 45' 12" N, Longitude: 104° 28' 26" W;
Rapid Infiltration Basin System 38° 44' 25" N, Longitude: 104° 24' 14" W

Certified Operator: Pete Heidebrecht, Classification A No. 116 (719) 597-5080

D. Discharge Points: Outfall 001A, following disinfection and prior to mixing with the receiving aquifer
Outfalls 050C(L), 050D(L) (down-gradient compliance wells)

E. Facility Flows: 4.8 Million Gallons per Day (MGD)

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F. Major Changes from Last Renewal:

This is a new permit, therefore there are no changes.

III. RECEIVING GROUNDWATER

A. Groundwater Identification: Upper Black Squirrel Creek Alluvial Groundwater Aquifer, El Paso County

a. Specified Area: All unconfined ground waters within the saturated zone underlying that area of El Paso County shown on Figure 3, Regulation No. 42.

b. Classification: The classifications of the unconfined ground water in the specified area are:
-Domestic Use-Quality
-Agricultural Use-Quality

c. Ground Water Quality Standards: The ground water quality standards included in Tables 1-4 of the "Basic Standards for Ground Water" 41.0 (5 CCR 1002-41) are assigned to all unconfined ground water in the specified area.

B. Groundwater Description

The Upper Black Squirrel Creek Basin is located about 25 miles east of Colorado Springs, and has an area of approximately 353 square miles. Streams in the area flow in response to thunderstorms, snowmelt, and prolonged rainfall. All streams are ephemeral and do not provide a dependable source of water. The upper Black Squirrel Creek basin is underlain by an alluvial aquifer and four bedrock aquifers. Most of the water used in the basin is pumped from the alluvial aquifer; the bedrock aquifers virtually are undeveloped (USGS Report, 1988).

1. Geology

On a macro level, the upper Black Squirrel Creek alluvial aquifer consists primarily of unconsolidated alluvial sands and gravels overlain by thin eolian sand deposits. The unconsolidated alluvial deposits consist of poorly graded to well graded sands, clayey and silty sands, and gravels with locally discontinuous clay lenses. Clay lenses occur at varying depths and thicknesses, but are sporadic in nature. The alluvial deposits reach thicknesses of up to 200 feet and are thickest where they overlay paleochannels. Depth to groundwater ranges from 50 to 100 feet below the ground surface.

The Upper Black Squirrel Creek Basin contains consolidated and unconsolidated deposits. Consolidated deposits in ascending stratigraphic order include the Cretaceous and Tertiary Denver Formation, and the Dawson Arkose, all of which are important aquifers. In addition, the Cretaceous Pierre Shale subcrops beneath the alluvial aquifer in the extreme southern part of the basin; however, the Pierre Shale does not yield any water to wells in the area. The Fox Hills Sandstone and the Laramie Formation are exposed in the southeastern part of the basin. The Dawson Arkose is exposed in the north-central and northeastern part of the basin.

2. Groundwater

Since the late 1800's, the alluvial aquifer has provided a dependable source of suitable quality water for domestic, agricultural, and municipal uses. Water from the alluvial aquifer is exported to suburbs east of Colorado Springs and to the Schriever Air Force Base, formerly known as the Falcon Air Force Station, by the Cherokee Metropolitan District. Water from the alluvial aquifer also is used extensively within the basin for

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irrigation and other agricultural purposes. The alluvial aquifer contains sufficient water to supply domestic, stock, irrigation, and municipal wells, and it is the principal aquifer in the basin area. Domestic water supply within the basin area is obtained from the aquifer by individual domestic wells.

The approximate area of the alluvial aquifer is 101.3 square miles. Horizontal ground-water movement occurs approximately perpendicular to the water-table contours. Water in the alluvial aquifer generally flows to the south of the basin. Thickness of the saturated alluvium during March 1984 ranged from less than 40 feet to more than 120 feet of the basin. The greatest thickness of the saturated alluvium is at the southern boundary of the basin.

Recharge to the aquifer is from deep percolation of precipitation, irrigation-return flow, infiltration of streamflow, and inflow from underlying bedrock aquifers. Natural discharge from the aquifer is by evapotranspiration and underflow, which accounts for groundwater that leaves the basin at the southern end.

Thirty-six ground-water samples were collected during 1984 by the United State Geological Survey (USGS); analyses of the samples indicated that concentrations of nitrite plus nitrate as nitrogen were greater than expected in the groundwater. Concentrations of nitrite plus nitrate in 14 percent of the samples exceeded the drinking-water standard of 10 mg/L. In general, groundwater from the alluvial aquifer is of suitable quality for most uses.

In 1988, the USGS published a report entitled "Geohydrology, Water Quality, and Preliminary Simulations of Ground-Water Flow of the Alluvial Aquifer in the Upper Black Squirrel Creek Basin, El Paso County, Colorado." This report was prepared in cooperation with the Cherokee Metropolitan District. The report is available from the USGS.

3. Surface Water

The upper Black Squirrel Creek basin is drained by Black Squirrel Creek and its tributaries, Brackett Creek and Big Springs Creek. Currently (1986), all streams are ephemeral and flow only in direct response to precipitation; streambeds in most areas are many feet above the water table. Because of the ephemeral nature of streams in the basin, streamflow does not provide a dependable source of water. Prior to large water-level declines caused by ground-water pumpage beginning during the 1950's and 1960's, segments of the streams were intermittent.

IV. FACILITIES EVALUATION

A. BASIS FOR NEW INTEGRATED SYSTEM

The Cherokee Metropolitan District Water Reclamation Facility and Rapid Infiltration Basins are located in El Paso County, just east of Colorado Springs, Colorado, Figure 1.

1. Replenish Alluvial Groundwater

The Cherokee Metropolitan District (CMD) is a longstanding quasi-municipal entity created as a special district under the Colorado Revised Statutes. The CMD, as a result of both regulatory water quality related requirements associated with its existing lagoon type wastewater treatment facility, and in an effort to more effectively utilize its water resources, initiated a significant capital construction project. The project includes undertaking the construction of the necessary conveyance facilities to transmit its raw wastewater together

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with wastewater received from the Schriever Air Force Base (SAFB) and the Meridian Service Metropolitan District (MSMD) to a new wastewater treatment facility (WWTF). The objective for the overall system is to treat the wastewater received from the contributing service areas to better than secondary treatment levels utilizing an activated sludge process incorporating biological nitrogen removal. The discharge of treated effluent from the WWTF is then conveyed by a pipeline under the control of the CMD to rapid infiltration basins located on a 70 acre parcel at the northwest corner of the intersection of Bar 10 Road and Henderson Road, Figures 2 and 3. At the rapid infiltration basin facility, the alluvial ground water in the Upper Black Squirrel Creek Designated Basin will be replenished.

2. Scope of Integrated System

Construction of the new WWTF and rapid infiltration basin facility are two components of an integrated system that also included construction of two new lift stations and a new interceptor sewer from the SAFB point of connection to the new WWTF site. The CMD has developed a substantial sanitary sewage collection system which conveys wastewater from its primary service area to the current WWTF site located on the downstream side of the district, immediately south of U.S. Highway 24 adjacent to the east side of the East Fork of Sand Creek. Lift Station No. 1 is located at the site of the current WWTF and will utilize some of the existing impoundments for preliminary treatment and flow equalization with the remainder functioning as emergency storage. A raw wastewater force main has also been constructed between the current WWTF site and the SAFB point of connection. This force main was originally constructed to convey wastewater from SAFB westerly to the CMD's existing WWTF. The force main was sized such that CMD can reverse the flow to convey its wastewater easterly from its existing WWTF site through this force main. The lift station located at SAFB will be relocated to serve as Lift Station No. 1. A second lift station is located along this force main due to the hydraulic conditions associated with conveying wastewater from the CMD's existing WWTF site easterly. A Schematic Overview of the entire system is shown in Figure 4.

3. Status of Permit for CMD Wastewater Treatment Facility

The CMD's current treatment facility consists of a five-cell aerated lined lagoon system located immediately south of U.S. Highway 24/State Highway 94 adjacent to the East Fork of the Sand Creek. Currently, effluent from this treatment facility is discharged to the East Fork of Sand Creek. When the new WWTF is placed into service, discharge from the current WWTF will be terminated.

The CMD will continue to utilize the site of the current WWTF into the future. Lift Station No. 1 is located at the site of the current WWTF. Also, some of the existing impoundments will be utilized for preliminary treatment and flow equalization with the remainder functioning as emergency storage.

Cell No. 1, together with its aeration equipment, will be retained and will provide a degree of pretreatment to the wastewater generated in the CMD's primary service area.

Cell No. 2 will be reconfigured into two cells. One cell will serve as the wet well for Lift Station No. 1 and provide flow equalization so the discharge from Lift Station No. 1 can be maintained at a relatively constant rate approximating the average daily influent flow. The remainder of Cell No. 2 will function as the primary emergency overflow/storage pond. In the event of a mechanical problem with either Lift Station No. 1 or No. 2 or the 14-inch force main, wastewater will automatically be transferred by gravity to the storage pond when the liquid level in the flow equalization/wet well exceeds the normal high operating level. This storage pond has a capacity of approximately 14.32 million gallons, which provides approximately 6.5 days of holding capacity at the design average day flow rate. A return pump station is provided between the primary emergency storage pond and the flow equalization/wet well to facilitate transfer of wastewater back to the flow

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equalization/wet well. The storage pond and flow equalization/wet well will be lined with a synthetic membrane liner to preclude any seepage from these structures.

Within the decommissioning of the CMD's existing WWTF, sludge accumulations will be removed from existing Cell Nos. 3, 4 and 5 and these cells will be left to sit idle. These cells will also be capable of functioning as emergency backup storage basins in the event of a catastrophe that mandates a holding time in excess of 6.5 days. An overflow from the primary emergency overflow/storage pond can be conveyed by gravity to the subsequent three cells. These cells would be dewatered by pumping back to the primary emergency storage pond once the lift stations and force main have been returned to operation.

B. Service Area and Lift Stations

The CMD's primary service area encompasses the area generally known as Cimarron Hills. This area lies east of Powers Boulevard, north of U.S. Highway 24/State Highway 94, south of Barnes Road and extends approximately one mile east of Marksheffel Road. This area constitutes the District's primary service area. The District has annexed 800 acres in the vicinity of Ellicott Highway and Drennan Road, significantly east of this location. That area currently receives and will continue to receive wastewater treatment service at the existing Ellicott Springs Resources, LLC wastewater treatment facility. Cherokee's primary service area currently receives wastewater treatment service at a treatment facility owned and operated by the District located immediately south of U.S. Highway 24/State Highway 94, adjacent to the East Fork of the Sand Creek. The location of the CMD service area and lift stations are shown in Figures 2 and 3.

Table 1 summarizes the information provided in the permit application for the lift stations in the service area.

Table 1
Lift Station Summary

Station Name/#	Firm Pump Capacity (gpm)	Peak Flows (gpd)	% Capacity (based on peak flow)
Terminal Avenue	1,390,000	290,000	20.9
Lift Station #1	2,590,000	Not Yet in Service	85.3
Lift Station #2	2,590,000	Not Yet in Service	85.3

The wet well at Lift Station No. 1 functions as a flow equalization basin so that the discharge from Lift Station No.1 can be maintained at a relatively constant rate approximating the average daily influent flow.

Lift Station No. 1 and No. 2 operate in series to convey wastewater from the Cherokee Metropolitan District's primary service area to the Cherokee Metropolitan District Water Reclamation Facility. Because these two lift stations operate in series, and the manner in which the pumping operation is controlled, a wet well is not required at Lift Station No. 2.

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C. Cherokee Metropolitan District-Cherokee Metropolitan District Water Reclamation Facility

1. Pretreatment Program

Discharges of non-domestic wastewater have the potential to interfere with the operation of a wastewater treatment facility and to pass through the treatment works or otherwise be incompatible with the operation of the facility. To prevent such impacts, State and EPA regulations, 5 CCR 1002-63 and 40 CFR Section 403.8 respectively, require the implementation of a pretreatment program for publicly owned treatment works that discharge to surface waters with total design flow greater than 5 mgd and that receive pollutants from industrial users.

Although the discharge is to groundwater instead of surface water, the Cherokee Metropolitan District Water Reclamation Facility would otherwise meet the criteria for requiring a pretreatment program, and has similar potential for impacts to the WWTF operations and discharges from non-domestic contributions. The Division has determined that implementation of a pretreatment program for the control of contributions of non-domestic wastewater from industrial users to the WWTF is reasonably necessary to achieve effluent limitations and standards. In accordance with the requirements Part 61.8(3)(r) of 5 CCR 1002-61, Part I.A.3 of the permit includes practice based effluent limits for implementation of a pretreatment program for Industrial Users. The requirements of Part I.A.3 are consistent with the requirements of above reference EPA and State pretreatment regulations.

The permittee has developed and implemented a pretreatment program that was approved by the EPA on November 16, 1998. The permit requires that this program continue to be implemented for the WWTF and to modify the program when necessary. A compliance schedule is included in Part I.A.3.b(v) of the permit that requires specific revision be made as necessary to address new effluent limits and water quality standards associated with the new permit.

2. Wastewater Treatment Processes

The Cherokee Metropolitan District Water Reclamation Facility is designed for the following parameters:

- Hydraulic Design Capacity of 4.8 MGD (maximum monthly average)
- Peak Hydraulic Capacity of 9.432 MGD
- Organic Capacity of 8,835 lbs. BOD_5/day

The Cherokee Metropolitan District Water Reclamation Facility consists of a mechanical treatment facility that includes an extended aeration activated sludge biological process, utilizing four sequencing batch reactors (SBRs) for carbon oxidation, nitrification and denitrification, followed by effluent flow equalization, and ultraviolet disinfection. Waste activated sludge is aerobically digested and dewatered utilizing centrifuges, as shown in Figure 5. Treated effluent from the mechanical WWTF is conveyed to a rapid infiltration basin system, approximately four (4) miles east, south-east, and consisting of 11 individual basins and/or structures, as shown in Figure 6. CMD received "Site Application Approval" on August 25, 2006, Site Approval Letter #4823.

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3. Biosolids Treatment and Disposal

Biosolids are treated in three (3) aerobic digesters. Liquid is removed in a centrifuge, and the biosolids are transported to off-site disposal areas.

3.1 EPA General Permit

EPA Region 8 issued a General Permit (effective October 19, 2007) for Colorado facilities whose operations generate, treat, and/or use/dispose of sewage sludge by means of land application, landfill, and surface disposal under the National Pollutant Discharge Elimination System. All Colorado facilities are required to apply for and to obtain coverage under the EPA General Permit.

3.2 Biosolids Regulations (Regulation No. 64)

While the EPA is now the issuing agency for biosolids permits, Colorado facilities that land-apply biosolids must comply with requirements of Regulation No. 64, such as the submission of annual reports as discussed later in this rationale.

D. Rapid Infiltration Basin System

The primary objective of the rapid infiltration basin system is groundwater replacement. Therefore, the design of the rapid infiltration basin system was based on maximizing the infiltration rate. Treatment to secondary or higher levels is recommended if maximizing the hydraulic loading and infiltration rate are the primary objectives of the rapid infiltration system. A secondary objective for the rapid infiltration basin system is water quality enhancement by additional treatment occurring within the upper alluvial material and/or the vadose zone. Given the high quality of effluent anticipated to be produced by the Cherokee Metropolitan District Water Reclamation Facility, with low ammonia and nitrate nitrogen concentrations, it is not anticipated that significant additional nitrification or nitrogen removal will occur as a result of utilizing the rapid infiltration process. However, some additional reduction in BOD_5, TSS, coliform, viruses, inorganic constituents, heavy metals, and organic compounds is anticipated as the treated wastewater migrates through the upper soil profile prior to reaching and comingling with the underlying groundwater.

As shown on Figure 3, the sites for the Cherokee Metropolitan District Water Reclamation Facility and the rapid infiltration basin facility are separated by approximately four miles. This became necessary due to the availability of a large enough parcel upon which to construct the Cherokee Metropolitan District Water Reclamation Facility with adequate buffer zones and the need to site the rapid infiltration basin facility in an area that would provide optimal infiltration and recapture of the reclaimed water by the CMD's southern well field. A pipeline was constructed between the Cherokee Metropolitan District Water Reclamation Facility and the rapid infiltration basin facility to convey the treated effluent in a manner that will ensure total containment and control of the water by the CMD.

The rapid infiltration basin facility consists of 11 rapid infiltration basins with a yard piping system to facilitate the controlled dosing of each basin or set of basins sequentially. The rapid infiltration basin system is sized to provide a total of approximately 1,064,300 square feet (24.43 acres) of infiltration surface area. The configuration of the rapid infiltration basin system and associated yard piping layout is shown on Figure 6.

Each infiltration basin has been constructed in a manner to maximize the amount and depth of clean sands and gravels underneath the infiltration surface (cell bottom). The average overall basin depth from the cell bottom

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to the top of the dike is approximately 6.5 feet. Basin side slopes were constructed at 3:1 slopes and a polypropylene liner was installed on the side slopes to minimize erosion. The bottom of each rapid infiltration basin is constructed as level as possible to help ensure a uniform flooding depth across the infiltration surface and preclude shallow ponding areas. This will promote better infiltration and reduce the potential for freezing in shallow areas under winter operating conditions.

Treated and reclaimed water from the Cherokee Metropolitan District Water Reclamation Facility will be introduced into each rapid infiltration basin through an inlet structure located at the termination of a 20-inch feeder lateral. Inlet structures are designed to dissipate inlet velocities and minimize erosion of the basin bottom immediately adjacent to the inlet structure. Flow equalization basins are provided at the Cherokee Metropolitan District Water Reclamation Facility downstream of the sequencing batch reactor (SBR) process and prior to ultraviolet disinfection and flow measurement. This provides for a more uniform and continual discharge from the treatment facility. A more uniform and continual discharge into the rapid infiltration basins will also help to minimize any erosion that could take place near the inlet structures.

The operational concept for the rapid infiltration basin system provides a total basin cycle time of 7 days under summer operating conditions and 10 days under winter operating conditions. The total basin cycle time has been divided into a "wet" period during which reclaimed water will be applied to a basin and permitted to infiltrate into the underlying soils and a subsequent "dry" period during which no reclaimed water will be applied and the underlying soil will be allowed to drain and re-aerate. A wet period of 2.25 days will be utilized followed by a 4.75 day dry period under summer operating conditions and a 7.75 day drying period under winter operating conditions. These wet-dry cycle periods were established to maximize the infiltration rate and are in accordance with EPA and WQCD Policy 96-1 recommendations.

The drying cycle period allows the surface of the infiltration basin to dry out and the upper subsurface soils to re-aerate. Provision of a drying period permits any organic material (suspended solids) that may collect on the infiltration basin bottom surface and inhibit the infiltration rate to dry, crack and disperse. Such has been documented to aid recovery of the infiltration rate between wetting cycles to near original conditions. Re-aeration of the upper subsurface soils enables these upper subsurface soils to be maintained in an aerobic condition, thereby helping to optimize treatment of the reclaimed water applied to the basin. Provision of this drying time will aid in minimizing the frequency at which infiltration surface cleaning activities must be conducted. The preliminary operational concept for the rapid infiltration basin system operating under design conditions (4.80 mgd) is summarized in Table 2.

Table 2
RAPID INFILTRATION BASIN SYSTEM
OPERATIONAL CONCEPT

	Summer Operating Conditions	Winter Operating Conditions
Application period (days)	0.91	0.91
Draining period (days)	1.34	1.34
Total "wet" cycle period (days)	2.25	2.25
Drying cycle period (days)	4.75	7.75
Total cycle period (days)	7.00	10.00

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V. PERFORMANCE HISTORY

A. Monitoring Data

1. Discharge Monitoring Reports – This is a new WWTF, therefore there is no monitoring data.

B. Compliance with Terms and Conditions of Previous Permit (CO-0024457)

The effluent discharged from the CMD's WWTF has been into the East Fork of Sand Creek. Earlier documentation provided by CMD has indicated that the discharge was confined in a surface water flow to the East Fork of Sand Creek and percolated into the stream's alluvial material prior to the confluence of Sand Creek with Fountain Creek. Sand Creek, the receiving stream for Cherokee's effluent, has standards for three parameters, pH, fecal coliform and dissolved oxygen. Over time, with the combination of the increase in the volume of water discharged from the CMD's WWTF coupled with the urbanization of the areas contiguous to the lower reaches of the East Fork of Sand Creek, a surface flow now extends from Cherokee's point of discharge to the confluence of Sand Creek with Fountain Creek. In the most recent renewal of the District's CDPS permit, the effluent was determined by the Division to reach Fountain Creek where it mixes with Fountain Creek's flow. As a result, additional standards apply to CMD's WWTF for the protection of Fountain Creek, including; whole effluent toxicity (WET), dissolved copper, dissolved lead, total mercury and free cyanide. Significant upgrades to the CMD's existing WWTF would be required in order to comply with these additional parameter requirements. The nature of these upgrades was such that replacement of the existing treatment facility would be required. Consequently, CMD has constructed a new groundwater WWT.

VI. TERMS AND CONDITIONS OF PERMIT

A. Groundwater Discharge Limitations

The water quality standards to which a discharge to groundwater must comply are based on the classifications assigned to the groundwater within a specific area. Within Water Quality Control Commission (WQCC) Regulation No. 42 "Site-Specific Water Quality Classifications and Standards for Ground Water", Section 42.7(3), the Upper Black Squirrel Creek Alluvial Aquifer has been classified for Domestic Use-Quality and Agricultural Use-Quality. The numeric groundwater quality standards associated with these classifications are contained in Tables 1 through 4 and Table A of WQCC Regulation No. 41 "The Basic Standards for Ground Water".

1. Technology-Based Limitations (Regulation 62)

The Federal Effluent Limitation Guidelines for domestic wastewater treatment facilities are the secondary treatment standards. These standards have been adopted, and are applied from Regulation No. 62 (Regulations for Effluent Limitations). These Regulations include effluent limitations that apply to all discharges of wastewater to State waters. These regulations are applicable to the discharge from the Cherokee Metropolitan District Water Reclamation Facility. The technology-based limitations will be applied at Compliance Point 001A, subsequent to treatment and prior to discharge to groundwater.

a. **BOD_5** - The BOD_5 concentration is the most stringent effluent limit and is therefore applied. The removal percentage for BOD_5 also applies based on the Regulations for Effluent Limitations.

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b. **Oil and Grease** – The oil and grease limitations from the Regulations for Effluent Limitations are 10 mg/l, and will be applied at Compliance Point 001A.

c. **pH** -The pH concentration specified in the Regulations for Effluent Limitations is 6.0 – 9.0, and is applied at Compliance Point 001A.

d. **Total Suspended Solids**—Although Total Suspended Solids (TSS) limitations were not included in the PEL determination, there are "Technology-Based" limitations for TSS pursuant to Regulation No. 62 that apply to this discharge. The Division has included TSS limitations of 45 mg/l for a 7-day average and 30 mg/l for a 30-day average. In addition, because CMD is discharging their treated wastewater into Rapid Infiltration Basins that are designed to "rapidly transmit" water into the subsurface, it is imperative that the interstices and/or voids of the Rapid Infiltration Basins not become clogged with solid debris. Based on CMD's WWTF, it is believed they can meet these limits at Compliance Point 001A.

2. **Water Quality-Based Limitations (Regulations Nos. 41 and 42)**

a. **Total Inorganic Nitrogen (TIN)**--The effluent limitation for nitrate nitrogen is established at 10 milligrams per liter (mg/l) by WQCC Regulation No. 41 "The Basic Standards for Ground Water" for the protection of human health and the groundwater aquifer as a drinking water supply. Because nitrite and ammonia can also form nitrate, compliance with the nitrate standard is achieved through imposition of a Total Inorganic Nitrogen (TIN) limit. TIN effectively measures nitrate and its precursors including nitrite and ammonia. The Division established the limit for TIN at Outfall 001A. This deviates from the approach in the site approval which established the point of compliance at the groundwater monitoring wells. The Division made this revision in approach due to the presence of elevated levels of nitrate in the groundwater which results in the absence of assimilative capacity in the groundwater, as discussed in Section III.B.2 of this fact sheet. This change in approach remains consistent with the effluent design criteria for the Cherokee Metropolitan District Water Reclamation Facility that were approved as part of the design approval process which include an ammonia nitrogen concentration of 2.0 mg/l, a nitrate plus nitrite nitrogen concentration of 5.0 mg/l and a TIN concentration of 7.0 mg/l, all as daily maximums to be achieved on a year round basis. This demonstrates that the CMD mechanical treatment facility provides for continuous nitrification and denitrification on a year round basis and incorporates biological nitrogen removal to limit the concentration of total inorganic nitrogen (TIN) contained in the reclaimed water to ensure protection of the aquifer as a drinking water supply.

b. **Total Coliform**—An ultraviolet (UV) disinfection process is incorporated into the Cherokee Metropolitan District Water Reclamation Facility. The design criteria for this disinfection process were established at 200 fecal coliform colonies per 100 milliliters (ml). It is unlikely that this disinfection process will be capable of consistently producing an effluent quality that would comply with the PEL for total coliform at the discharge point from the WWTF (Compliance Point 001A). However, results from the infiltration basin pilot study undertaken by CMD and URS Corporation in 2002 and 2003 demonstrate complete removal of coliform bacteria within the upper reaches of the vadose zone (unsaturated zone). As part of that pilot study, wastewater from the Colorado Springs Utilities (CSU) WWTF was continuously applied to a pilot infiltration basin for a period of approximately 160 days. Samples were collected from lysimeters installed in the vadose zone at depths ranging from 7 to 40 feet and analyzed for total coliform bacteria. Coliform bacteria were not

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detected in any of the lysimeter samples, even though coliforms were present in the applied wastewater at densities as high as 1,600 per 100 ml. This indicates that compliance with the effluent limit for total coliform can be achieved prior to the reclaimed water reaching the groundwater table. Total Coliform removal is expected prior to mixing with groundwater. The compliance point for total coliform is established at the groundwater monitoring wells consistent with the site application approval

c. **pH**—The pH limit is 6.5-8.5, based on Regulation 41. The Cherokee Metropolitan District Water Reclamation Facility is capable of meeting this limit either at Compliance Point 001A, or the down-gradient ground water monitoring and compliance wells. The pH limitation of 6.5 – 8.5 is applied at the down-gradient groundwater monitoring and compliance wells.

d. **Sulfate and Chloride--**The effluent limitation determination established for sulfate and chloride is 250 mg/l for each parameter. On July 26, 2006, CMD collected effluent samples from both the existing CMD and PBH lagoon treatment facilities. These samples were analyzed for chloride and sulfate concentrations. Results of the analyses of these effluent samples were as follows:

	Chloride (mg/l)	Sulfate (mg/l)
CMD lagoon effluent	220	83
Paint Brush Hills lagoon effluent	53	88

The analytical results for the samples from each individual WWTF were mass balanced based upon the anticipated wastewater contribution from each entity at startup of the Cherokee Metropolitan District Water Reclamation Facility. These mass balance calculations indicated an expected effluent quality from the Cherokee Metropolitan District Water Reclamation Facility of 161.1 mg/l for chloride and 84.8 mg/l for sulfate.

The results of this mass balance procedure are a conservative representation of expected effluent quality.. These projections are conservative because both of the existing treatment facilities employ lagoon treatment systems with long detention times and large open water surface areas; whereas the Cherokee Metropolitan District Water Reclamation Facility will be a mechanical type facility incorporating a relatively short detention time and limited open water surface area. Lagoon systems with their large open water surface areas experience significant evaporative losses, especially during the hot summer months. This evaporative effect tends to concentrate inorganic substances, such as chloride and sulfate, resulting in elevated effluent concentrations. The Cherokee Metropolitan District Water Reclamation Facility will have significantly less open water surface area and will experience very limited evaporative losses. Thus, the concentrating effect of the lagoon treatment system will not be present and the expected effluent concentrations would be lower than those predicted by the mass balance procedure.

Upper Black Squirrel Creek aquifer and/or groundwater quality data indicates historic sulfate concentrations in the range of 17 mg/l to 140 mg/l with an average of 49 mg/l and historic chloride concentrations in the range of 6 mg/l to 76 mg/l with an average of 15 mg/l. The Upper Black Squirrel Creek aquifer serves as the base potable water supply for the CMD. Given the relatively low concentrations of sulfate and chloride in the groundwater, it is unlikely that the reclaimed water from the Cherokee Metropolitan District Water Reclamation Facility would contain concentrations of sulfate and chloride which would approach the PEL of 250 mg/l. The limitations for both sulfate and chloride

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are established at the down-gradient groundwater monitoring and compliance wells.

e. **Cyanide and Metals**--Effluent limitations for cyanide and three metals parameters; chromium, iron and lead have been established by the Division in the PEL document. The Division has expressed concern relative to the ability of the Cherokee Metropolitan District Water Reclamation Facility to achieve compliance with the effluent limits established for cyanide and the metals parameters. Therefore, a sampling and analysis program was developed to aid in resolving these concerns for achieving compliance. Generally, the sampling and analysis program developed involved collecting individual effluent samples from the existing CMD and Paint Brush Hills (PBH) WWTFs on a monthly basis. Laboratory analysis of each individual sample was then conducted for cyanide and each of the metals parameters. The analytical results for the samples from each individual WWTF were then mass balanced based upon the anticipated wastewater contribution from each entity at start-up of the Cherokee Metropolitan District Water Reclamation Facility. The results of this mass balance procedure are intended to provide a conservative representation of the expected effluent quality from the Cherokee Metropolitan District Water Reclamation Facility relative to cyanide and the metals parameters. The projection is seen as conservative, because the existing WWTFs are both lagoon systems, whereas the Cherokee Metropolitan District Water Reclamation Facility will employ an activated sludge treatment process that will enable the operators to adjust MLSS concentrations to optimal levels, thereby likely increasing these parameters' concentrations in the biomass while decreasing their levels in the effluent. Groundwater monitoring compliance wells will be established to verify compliance with cyanide and the metals parameters.

The Cherokee Metropolitan District Water Reclamation Facility, which is a mechanical type treatment facility employing biological nitrogen removal, will be capable of producing a better quality effluent in all respects than is currently being produced or could be produced by either of the existing lagoon treatment systems. However, the WQCD and the U.S. EPA takes the position that neither the existing WWTFs nor the Cherokee Metropolitan District Water Reclamation Facility include processes specifically designed for cyanide or metals reduction; therefore, any cyanide or metals reduction would be coincidental and, would be equal to or only slightly better than the existing WWTFs. In view of the above, it is judged that the sampling and analysis program undertaken provides a conservative representation of the anticipated effluent quality from the Cherokee Metropolitan District Water Reclamation Facility relative to cyanide and the metals parameters.

At the time the initial assessment was made, nine samples of the effluent from the existing CMD WWTF had been collected and analyzed for the parameters of concern and eight samples of the effluent from the PBH WWTF had likewise been collected and analyzed. Table 3 shows the expected effluent quality from the Cherokee Metropolitan District Water Reclamation Facility based on a mass balance procedure versus the PELs established for cyanide and each of the metals parameters contained in the PEL determination. As can be seen, the expected effluent concentrations are less than the PELs for all four parameters.

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Table 3
EXPECTED EFFLUENT QUALITY VS.
PRELIMINARY EFFLUENT LIMIT

Parameter	Expected Effluent Concentration (mg/l)	PEL (mg/l)
Cyanide, WAD [1)]	<0.010	0.2
Chromium, Total	<0.025	0.1
Iron, Dissolved	<0.150 [2)]	0.3
Lead, Dissolved	<0.007	0.05

1) WAD = Weak acid dissociable
2) Represents expected effluent concentration of total recoverable iron, dissolved iron fraction would be less

f. **Total Dissolved Solids**—Although Total Dissolved Solids (TDS) were not included in the PEL determination, TDS is a groundwater limitation, pursuant to Regulation No. 41, and pollutant of concern. Therefore, a TDS limitation of 400 mg/l has been incorporated into the permit. The Cherokee Metropolitan District Water Reclamation Facility is expected to meet this limitation at Compliance Point the down-gradient groundwater monitoring and compliance wells. The WQCD has confirmed that the Cherokee Metropolitan District Water Reclamation Facility can meet the TDS limitation of 400 mg/l.

B. Monitoring

1. Influent Monitoring

All monitoring frequencies are based on the WQCD Policy, "Baseline Monitoring Frequency, Sample Type, and Reduced Monitoring Frequency Policy for Industrial and Domestic Wastewater Treatment Facilities" dated May 1, 2007.

Influent sampling location 300I is equipped with a composite sampler and will draw the influent sample from a location upstream of the 18" Parshall flume located in the Headworks Building, Figure 6.

2. Effluent Monitoring

Effluent sampling location 001A is equipped with a composite sampler and will draw the effluent sample from a location downstream of the 18" Parshall flume located in the UV Disinfection Building. Flow entering the Rapid Infiltration Basin Facility is monitored by a magnetic flow meter located in the Flow Measurement and Pressure Regulation Station (001B). Flow data from all three monitoring points is indicated, totalized and recorded by the plant-wide SCADA system, Figure 6.

3. Groundwater Monitoring and Compliance Wells

A total of four (4) Groundwater Monitoring and Compliance Wells (wells) will be utilized at the Rapid Infiltration Basin Facility. Specifically, two (2) existing up-gradient wells and two (2) new down-gradient wells will be installed around the rapid infiltration basins, as shown in Figure 6.

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There are two (2) existing CMD production wells located up-gradient of the rapid infiltration basins, CMD Wells No. 11 and No. 12, which will serve as the up-gradient background wells. These wells, labeled 050A and 050B on Figure 6, are located sufficiently far to the north of the rapid infiltration basins to remain up-gradient and un-affected by the groundwater mound expected from the operation of the rapid infiltration basins. Also, because these wells are completed through the alluvial aquifer and pumped to supply water to the CMD system, they will provide samples that are representative of the groundwater quality immediately up-gradient of the area that could be potentially impacted by the replacement water.

According to Regulation No. 41, the point of compliance for groundwater discharges is a vertical surface at some specified distance hydrologically downgradient from the activity that is being monitored for compliance, and this point must be within the property boundary. As stated in the draft permit, the point of compliance for the WWTF discharges to groundwater is a location between the basins and the property boundary on the downgradient side of the last set of rapid infiltration basins. This means that the quality of any groundwater passing through this vertical surface (as defined by the alignment of the wells) must not be impaired by the discharge from the WWTF.

The wells shall be designed to provide access at different depths to sample the upper groundwater (0 to 5 feet) that passes through this vertical surface for determination of compliance. Subsurface movement of the WWTF effluent from the basins will pass through this vertical surface in two ways. First, the effluent could reach and mix with groundwater and the mixed flow would be sampled from the well for compliance determination. Second, the effluent would reach the well before reaching groundwater and be sampled for compliance determination. The latter could be a flow that is physically separated from the lower natural flow of groundwater. The design of the compliance wells, especially the screened intervals for sampling, must account for the variability in the levels of groundwater as this flow (or flows) crosses the vertical surface.

Since the background depth to groundwater below the basins is about 100 feet when the WWTF begins to discharge, the depth to groundwater at the compliance wells will decrease with time as the discharge creates the predicted groundwater mound. So, depth to groundwater levels at the well locations will initially be 100 feet and then gradually decrease by 20-50 or more over during the first decade of WWTF operation and discharge, according to modeling predictions conducted by CMD.

Given the above, the Division shall require groundwater monitoring and compliance at various elevations within the proposed groundwater monitoring and compliance wells. Specifically, Nested (multiple wells installed in same bore hole) or Clustered (adjacent wells completed and screened to different depths) groundwater monitoring and compliance wells are required that are capable of providing a sample of the treated effluent prior as it reaches the vertical surface. The wells will provide screening at three levels: 5 feet above and below background groundwater level (95-105 feet [L]), 5 feet above and below projected groundwater mound surface (45- 55 feet [U]), and mid-level (70-80 feet [M]). The nested or cluster wells will be at two (2) locations, each one directly downgradient from one of the two basins; identified as 050C and 050D. Note, the letters "L", "M", and "U" mean lower, middle, and upper, respectively in relationship to the screened interval of the wells and the compliance points within the wells.

The Division will base the determination of compliance based on the quality of the groundwater sample taken at each location from the well with the shallowest depth to groundwater. So, the permit will require monitoring and analysis of groundwater from all screened intervals, but the compliance will be based on the sample from the deepest screened interval (95-100 ft) at each of the two locations. When groundwater rises

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and can be sampled from shallower screened intervals, then the permit will be amended to change the compliance requirement to these locations.

C. Reporting

1. Discharge Monitoring Report – The Cherokee Metropolitan District Water Reclamation Facility must submit a Discharge Monitoring Report (DMR) on a monthly basis to the Division. These reports should contain the required summarization of the test results for all parameters and monitoring frequencies shown in Part I.B of the permit. See the permit, Part I.B, C and D for details on such submission.

2. Annual Biosolids Report – The permittee will be required to submit an annual Biosolids Report which includes the results of all biosolids monitoring performed for the year and information on management practices, land application sites, site restrictions and certifications. The Annual Biosolids Report is due by **February 19th** of the following year. Refer to Part I, Section D.3 of the permit.

3. Special Reports – Special reports are required in the event of an upset, bypass, or other noncompliance. Please refer to Part II.A. of the permit for reporting requirements. As above, submittal of these reports to the US Environmental Protection Agency Region VIII is no longer required.

D. Additional Terms and Conditions

1. Signatory Requirements – Signatory requirements for reports and submittals are discussed in Part I, Section D.1 of the permit.

2. Compliance Schedules – No compliance schedules are included in the permit.

3. Industrial Stormwater Evaluation--Stormwater discharges from wastewater treatment facilities with a design flow of 1.0 MGD or more, or that is required to have an approved pretreatment program, are required to be covered by a CDPS Stormwater Discharge Permit Associated with Light Industry Permit or a Stormwater No Exposure Certification in order to be discharged to Waters of the State. If a facility meets these requirements, a permit application or certification must be completed and submitted to the Division at least 30-days prior to beginning operations. Cherokee Metropolitan District Water Reclamation Facility is specifically included under the requirements discussed above. Stormwater permitting issues for this facility will be handled separately by the Division's Stormwater Unit.

E. Economic Reasonableness Evaluation

Section 25-8-503(8) of the revised (June 1985) Colorado Water Quality Control Act required the Division to "determine whether or not any or all of the water quality standard based effluent limitations are reasonably related to the economic, environmental, public health and energy impacts to the public and affected persons, and are in furtherance of the policies set forth in sections 25-8-102 and 25-8-104."

The Colorado Discharge Permit System Regulations, Regulation No. 61, further define this requirement under 61.11 and state: "Where economic, environmental, public health and energy impacts to the public and affected persons have been considered in the classifications and standards setting process, permits written to meet the standards may be presumed to have taken into consideration economic factors unless:

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1. A new permit is issued where the discharge was not in existence at the time of the classification and standards rulemaking, or

2. In the case of a continuing discharge, additional information or factors have emerged that were not anticipated or considered at the time of the classification and standards rulemaking."

The evaluation for this permit shows that this is a new facility not in existence at the time of water quality standards rulemaking. However, based on available data, the resulting water quality standard-based effluent limitations are determined to be reasonably related to the economic, environmental, public health, and energy impacts to the public and affected persons. If the permittee disagrees with this finding, pursuant to 61.11(b)(ii) of the Colorado Discharge Permit System Regulations, the permittee should submit all pertinent information to the Division during the public notice period.

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Figure 1-Location Map

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Figure 2

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LEGEND

CMD	CHEROKEE METROPOLITAN DISTRICT
MSMD	MERIDIAN SERVICE METROPOLITAN DISTRICT
SAFB	SCHRIEVER AIR FORCE BASE

EXHIBIT H-2
SYSTEM OVERVIEW MAP
CHEROKEE METROPOLITAN DISTRICT
CDPS PERMIT APPLICATION

GMS, INC.
CONSULTING ENGINEERS
611 N. WEBER, SUITE 300
COLORADO SPRINGS, COLORADO 80903
JULY 2009

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Figure 3

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Figure 4

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Figure 5

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Figure 6

VII. REFERENCES

A. Colorado Department of Public Health and Environment, Water Quality Control Division Files.

B. "Design Criteria Considered in the Review of Wastewater Treatment Facilities", Policy 96-1, Colorado Department of Public Health and Environment, Water Quality Control Commission, April 2007.

C. Colorado Discharge Permit System Regulations, Regulation No. 61, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective April 30, 2008.

D. Regulations for Effluent Limitations, Regulation No. 62, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective March 30, 2008.

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E. Pretreatment Regulations, Regulation No. 63, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective April 01, 2007.

F. Biosolids Regulation, Regulation No. 64, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective March 01, 2008.

G. Procedural Regulations for Site Applications for Domestic Wastewater Treatment Works, Regulation No. 22, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective June 30, 2004.

H. Regulation Controlling discharges to Storm Sewers, Regulation No. 65, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective May 30, 2008.

I. Water and Wastewater Facility Operator Certification Requirements, Regulation No. 100, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective April 30, 2006.

J. Geohydrology, Water Quality, and Preliminary Simulations of Ground-Water Flow of the Alluvial Aquifer in the Upper Black Squirrel Creek Basin, El Paso County, Colorado; David R. Buckles K. R. Watts, U. S. Geological Survey, 1988.

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Randy T. Ogg
April 26, 2010

VIII. PUBLIC NOTICE COMMENTS

During the public notice period (March 19 through April 18, 2010), written comments on the proposed permit were received from three entities:

> GMS Inc on behalf of the Cherokee Metropolitan District
> MacDougall, Woldridge & Worley, P.C. and Halepaska and Associates on behalf of the Farmer Family. Three letters previously sent to the Division regarding the facility were also provided and requested to be added to the administrative record for the permit.

The comments are available for public review. Summaries of these comments are provided below and followed by the Division's response.

GMS Inc on behalf of the Cherokee Metropolitan District (CMD)

Comment No.1: Effluent Monitoring Locations and Points of Compliance

CMD is confident the WWTF effluent will be in compliance with all of the proposed effluent limits, including the metals limits, at Outfall 001A a significant amount of the time. Relative to total coliform there is a reasonable potential of meeting the effluent limit at the discharge of the WWTF during initial operation when the flow through rate will be significantly below the rated capacity. Since the effluent from the WWTF will be conveyed to the Rapid Infiltration Basin Facility in a closed conduit, there is little likelihood of the WWTF effluent being contaminated after it leaves the WWTF.

It would not appear to be necessary to monitor ground water quality (after the WWTF effluent has mixed with the native ground water) for any parameter if the WWTF effluent was in compliance with the permit limitation for that parameter. CMD sees no benefit to be gained from expending the time, money and effort of sampling the ground water monitoring and compliance wells if the treated effluent already meets discharge permit limitations at the discharge from the WWTF (Outfall 001A).

CMD requests that the effluent monitoring and compliance requirements in the final permit be modified to allow for monitoring of all effluent parameters at Outfall 001A and only require monitoring and analysis of ground water monitoring and compliance well samples for those parameters that exceed the effluent limitations at Outfall 001A.

Response:

As stated, the proposed approach to determine compliance with limitations is not possible under permitting regulations. Between the end of the treatment process and the entrance of wastewater flows into state waters, there can only be one point of compliance for each limitation (as expressed) for each reporting interval. For example, there can be a pH limitation of 6.0-9.0 at one compliance point and a

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pH limitation of 6.5 to 9.0 at another point. However, the location of a compliance point can be changed through the permit amendment process.

Given groundwater monitoring wells will be installed, the comment addresses the need to conduct monitoring at these wells if all effluent limits can be met at Outfall 001A. The Division relies on the site application and design approval process to determine how treatment will be provided to meet effluent limits in a permit for a domestic WWTF. In this case the site application approval established a point of compliance at the monitoring wells for effluent limits established based on groundwater standards, and the design approval was consistent with the site approval. The Division developed this permit with the point of compliance at the wells for effluent limits established based on groundwater standards with the exception of nitrate. The basis for moving the point of compliance for nitrate is explained in the fact sheet, and is consistent with how treatment was demonstrated in the site approval process. While the WWTF will provide advanced treatment, the basis of the compliance point being established at the monitoring wells was uncertainty about the ability to meet all effluent limits at Outfall 001A at design capacity. This uncertainty is reflected by the following sentence in the above CMD comment.

> "CMD is confident the WWTF effluent will be in compliance with all of the proposed effluent limits, including the metals limits, at Outfall 001A a significant amount of the time. "

Compliance points can be adjusted through adequate demonstration of treatment through the site approval process and permit amendment process.

Comment No.2: Total Dissolved Solids (TDS) Limitation

Relative to the numeric limit for TDS, there appears to be a discontinuity in Regulation No. 41 between Table 4 and the Statement of Basis and Purpose. According to Table 4, the TDS limit would be 400 mg/l with a background concentration of less than 320 mg/l and would be 1.25 times the background concentration with background concentrations greater than 320 mg/l. However, the Statement of Basis and Purpose (41.12) states on page 27 in the sixth full paragraph, "If the background concentration is less than 400 mg/l then the maximum allowable concentration of TDS is 500 mg/l. This value is the secondary drinking water standards and is instituted to maintain a high quality water." The rationale presented in the Statement of Basis and Purpose for a 500 mg/l lower limit appears reasonable. Our opinion is that a limit of 500 mg/l or 1.25 times the background, whichever is least restrictive, is appropriate and would be in accordance with the intent of Regulation of No. 41.

The CMD requests that the effluent limitation for TDS in the final permit be revised to 500 mg/l or 1.25 times the background TDS concentration, whichever is least restrictive.

Response:

CMD did not provide information regarding the background concentration of TDS in their permit application. Therefore, the Division does not have data available to establish the background concentration of TDS. The Division's practice is to implement a Total Dissolved Solids (TDS) limitation of 400 mg/l, in accordance with Regulation No. 41, Table 4, TDS Water Quality Standards, when there is no background data for TDS. The Division will consider a different TDS effluent limitation based on background TDS data provided by CMD. CMD has two up-gradient groundwater wells that could be used for collecting data for establishing this background level.

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Comment No.3: Monitoring Frequency for Nitrate and Nitrite

CMD takes exception to the weekly monitoring frequency listed in the tabulation for Outfall 050A and 050B (the up-gradient monitoring wells) in Part I.A.1 of the draft permit.

Division Policy WQP-20 only requires monthly monitoring of ground water monitoring wells. This would be appropriate in that seasonal changes in ground water quality could be expected. However, it is unlikely that these changes in ground water quality would be so rapid as to warrant weekly monitoring. CMD sees no benefit to be gained from expending the time, money and effort of sampling the up-gradient ground water monitoring wells on a weekly basis for nitrate and nitrite. CMD's opinion is that monthly monitoring would provide adequate information relative to changes in background water quality.

The CMD requests that the monitoring frequency for nitrate and nitrite at Outfalls 050A and 050B be changed to monthly in the final permit.

Response:

This is a typographical error in the draft permit. The permit is changed to reflect monthly groundwater monitoring for these parameters.

Comment No.4: Total Coliform Limitations and Reporting

The effluent limitations in Part I.A.1 of the draft permit for Outfalls 050C, 050D, 050E and 050F indicates an effluent limit for total coliform of 1.0 colonies per 100 ml as a 30 day average to be reported monthly. It is our understanding that the total coliform effluent limit is implemented as an annual average. The CMD requests that the effluent limitation table for Outfall 050C, 050D, 050E and 050F be revised accordingly.

Response:

The comment may be referring to text in a previous version of Regulation No. 41.

As stated in Regulation No. 41, The Basic Standards for Ground Water, Table 1, Domestic Water Supply—Human Health Standards, and Footnote a;

> "When the Membrane Filter Technique is used for analysis, the average of all samples taken within thirty days must be less than 1 organism per 100 milliliters of sample. When the Multiple Tube-Fermentation Method is used for analysis, the limit is less than 2.2 org/100 ml."

Therefore, the Division shall implement the 30-day average limitation of 1.0 org/100 ml.

Comment No.5: Sample Type for Oil and Grease

The sample type in the tabulation of effluent limitations for oil and grease at Outfall 001A in Part I.A.1 of the draft permit is listed as grab. Part I.A.1 of the draft permit under the heading "Oil and Grease Monitoring" on page 3 indicates that a grab sample and analytical analysis for oil and grease is only required in the event an oil sheen or floating oil is observed at the point of compliance. No. 19 under Part 1.C defines "visual" as observing the discharge to check for the presents of visible sheen or floating oil.

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CMD requests that the sample type for oil and grease at Outfall 001A in the final permit be revised to Visual and Grab in accordance with the above.

Response:

Regulation No. 62, Regulations for Effluent Limitations, Table (1) Numeric Limitations, footnote 5/; states:

> "A numeric effluent limit will be assigned in permits for discharges to surface waters, however, monitoring for a "visual sheen" will generally be required. Where a visual sheen is detected, the discharger will be required to collect a grab sample and have it analyzed for oil and grease. Monitoring for oil and grease may be required where there is reasonable potential that oil and grease will be present in the effluent at concentrations at or above 10 mg/l."

Oil and grease is included in the Preliminary Effluent Limitations (June 15, 2006), with a numeric limitation of 10 mg/l as a maximum limit. Based on the volume of effluent that the WWTF will be treating, and the various collection systems that will be pumping effluents to the WWTF, the Division believes there is "reasonable potential" that oil and grease could be at or above 10 mg/l. Therefore, oil and grease shall remain in the permit as a pollutant of concern with an effluent limitation of 10 mg/l.

Comment No.6: Installation of Downgradient Monitoring and Compliance Wells

The draft permit states that four (4) new downgradient ground water monitoring and compliance wells are to be installed, but does not specifically address at what point in time these monitoring wells are to be installed and must be operational. Prior to commencing construction of the monitoring wells, it would be prudent to know the exact number, location, depth, and other pertinent requirements associated with monitoring wells. CMD has begun preliminary negotiations with a well driller for installation of the downgradient ground water monitoring and compliance wells. It appears that up to thirty (30) days may be required for construction of these monitoring wells.

The current target date for the WWTF to be ready to accept and process wastewater is June 21, 2010. The start-up of this new WWTF is critical, since the existing WWTF operated by CMD will be shut-down when the new WWTF is operational.

Thus, CMD requests that WQCD to provide confirmation as to the number, location, depth, etc. of the monitoring wells prior to the issuance of the permit and include this information in the permit. Once the pertinent requirements for the monitoring wells have been established, physical construction of the monitoring wells could begin.

Response:

The groundwater monitoring and compliance wells must be installed and operational (i.e., capable of providing a representative groundwater sample and elevation measurement) at the time the WWTF discharges treated effluent into the Rapid Infiltration Basins. The details for these groundwater wells are provided in this Fact Sheet. Also, the Division believes there is sufficient time for CMD to complete the installation of these wells before the projected first discharge to the basins in late June 2010.

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Comment No.7: Screened Interval for Downgradient Monitoring and Compliance Wells.

The draft Fact Sheet appears to contain conflicting direction relative to the location of the screened interval for the downgradient ground water monitoring and compliance wells.

- The second paragraph on page 14 of the Rationale document states "Also, these monitor well locations will provide ground water samples that better represents the water quality of the aquifer because they will allow the replacement water to flow through the aquifer a sufficient distance to thoroughly mix with upgradient ground water before sampling." (emphasis added).
- The third paragraph on page 14 of the Rationale document states "To provide representative samples of the downgradient ground water quality, each well will be drilled to approximately 20 feet below the current water table depth and constructed with a 20 foot length of PVC well screen. The target depth for the top of the well screen will be the depth at which the "mounding water table" is estimated and/or projected."
- The fourth paragraph on page 14 of the Rationale document justifies locating the top of the 20 foot length of well screen at the mounding water table elevation based on the assumption that the water table will rise due to ground water mounding beneath the rapid infiltration basins, thus, increasing the depth of submergence over time and placing the well screen interval of each well at approximately the mid-depth of the saturated aquifer zone where there should be adequate mixing of the infiltrated water with the native ground water.

Installation of the screened interval as described in the third paragraph on page 14 of the draft Fact Sheet presents several concerns.

- The first concern relates to establishing the vertical location of the screened interval. Ground water modeling of the alluvial aquifer in the vicinity of the Rapid Infiltration Basin Facility indicates that the height of the ground water mound that will form under the infiltration basins will vary with time and the volume of water applied to the infiltration basins. Under initial operating conditions, the ground water mound height is projected to be approximately 20 feet after 1 year of operation. Under design application conditions, the ground water mound height is projected to be as much as 50 feet after 10 years of operation. Placing the top of the well screen at the depth at which the mounding water table is projected to be after 10 years of operation could result in the entire screened interval being above the mounded water table under initial conditions. This would preclude being able to collect samples under initial conditions.
- Installation of the screened interval above the current native ground water table would also provide no opportunity for the infiltrated water to comingle and mix with the native ground water, thus samples from the monitoring wells would be representative of only the infiltrated water. Such would indicate the quality of the infiltrated water, but would not provide information relative to actual changes in the chemistry of the native ground water. Based on previous discussions with WQCD and our past experience with installation of WQCD required groundwater monitoring wells, our understanding is that the screened interval should extend into the native ground water table such that samples collected represent the comingling and mixing of the infiltrated water and the native ground water.
- Finally, we see no benefit to be gained by drilling the wells to 20 feet below the current water table if the screened interval is to be installed above the current water table.

In the permit application, the CMD suggested the downgradient ground water monitoring and compliance wells be drilled to approximately 20 feet below the current water table depth and constructed with a 20 foot length of well screen located such that the top of the well screen be located at the depth at which the water table is encountered during drilling. It could be argued that installation of the screened interval below the current native ground water table could result in the samples from the monitoring wells being representative of only the native

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ground water. This would be particularly true if mixing of the infiltrated water and native ground water were minimal and the height of the ground water mound was significantly above the elevation of the native ground water table.

As a compromise, CMD requests that the permit to call for the screened interval of the downgradient ground water monitoring and compliance wells (Outfalls 050C, 050D, 050E and 050F) to be installed with ten feet of screen above and ten feet of screen below the current native ground water table. This would provide the opportunity for some mixing and comingling of the infiltrated water and native ground water to occur and thus would provide samples representative of the comingled ground water. It is within this 20 foot interval of the saturated aquifer zone that we would expect the bulk of the mixing of infiltrated water and native ground water to occur. The intent of Regulation No. 41 is to protect the classified beneficial uses of the ground water. Installation of the screened interval as described above, would document that the infiltrated water is not adversely impacting the native ground water to the extent that the designated beneficial uses of the ground water are being jeopardized.

Response:

The Division agrees that the discussion in the draft permit on the downgradient groundwater monitoring and compliance wells requires clarification. Also, based on an evaluation of public comments on the appropriate intervals for screening these wells, the Division has adjusted the nature of these wells to address these comments. These changes are explained in detail below and incorporated into the permit and fact sheet.

According to Regulation No. 41, the point of compliance for groundwater discharges is a vertical surface at some specified distance hydrologically downgradient from the activity that is being monitored for compliance, and this point must be within the property boundary. As stated in the draft permit, the point of compliance for the WWTF discharges to groundwater is a location between the basins and the property boundary on the downgradient side of the last set of rapid infiltration basins. This means that the quality of any groundwater passing through this vertical surface (as defined by the alignment of the wells) must not be impaired by the discharge from the WWTF.

The wells are designed to provide access at different depths to sample the upper groundwater (0 to 5 feet) that passes through this vertical surface for determination of compliance. Subsurface movement of the WWTF effluent from the basins will pass through this vertical surface in two ways. First, the effluent could reach and mix with groundwater and the mixed flow would be sampled from the well for compliance determination. Second, the effluent would reach the well before reaching groundwater and be sampled for compliance determination. The latter could be a flow that is physically separated from the lower natural flow of groundwater.

The design of the compliance wells, especially the screened intervals for sampling, must account for the variability in the levels of groundwater as this flow (or flows) crosses the vertical surface. As stated in CMD comments:

> "Ground water modeling of the alluvial aquifer in the vicinity of the Rapid Infiltration Basin Facility indicates that the height of the ground water mound that will form under the infiltration basins will vary with time and the volume of water applied to the infiltration basins. Under initial operating conditions, the ground water mound height is projected to be approximately 20 feet after one year of operation.

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> Under design application conditions, the ground water mound height is projected to be as much as 50 feet after ten years of operation."

Since the background depth to groundwater below the basins is about 100 feet when the WWTF begins to discharge, the depth to groundwater at the compliance wells will decrease with time as the discharge creates the predicted groundwater mound. So, depth to groundwater levels at the well locations will initially be 100 feet and then gradually decrease by 20-50 or more over during the first decade of WWTF operation and discharge.

Given the above, the Division shall require groundwater monitoring and compliance at various elevations within the proposed groundwater monitoring and compliance wells. Specifically, Nested (multiple wells installed in same bore hole) or Clustered (adjacent wells completed and screened to different depths) groundwater monitoring and compliance wells are required that are capable of providing a sample of the treated effluent prior as it reaches the vertical surface. The wells will provide screening at three levels: 5 feet above and below background groundwater level (95-105 feet), 5 feet above and below projected groundwater mound surface (45- 55 feet), and mid-level (70-80 feet). The nested or cluster wells will be at two locations, each one directly downgradient from one of the two basins.

The Division will base the determination of compliance based on the quality of the groundwater sample taken at each location from the well with the shallowest depth to groundwater. So, the permit will require monitoring and analysis of groundwater from all screened intervals, but the compliance will be based on the sample from the deepest screened interval (95-100 ft) at each of the two locations. When groundwater rises and can be sampled from shallower screened intervals, then the permit will be amended to change the compliance requirement to these locations.

Halepaska and Associates on behalf of the Farmer Family

Comment No.1: Monitor Well Design

According to the fact sheet, the downgradient groundwater monitoring and compliance wells are to be constructed as:

> "To provide representative samples of the down-gradient groundwater quality, each well will be drilled to approximately 20 feet below the current water table depth and constructed with a 20 foot length of PVC well screen. The target depth for the top of the well screen will be the depth at which the "mounding water table" is estimated and/or projected...."

These conditions cannot be met simultaneously. The water table in the vicinity of the proposed downgradient monitor wells (050C, 050D, 050E, 050F) is estimated to rise approximately 25 feet as a result of the operation of the rapid infiltration basins. So if the target depth for the top of the well screen is the top of the mound and the screened interval is 20 feet, then screen will be above the water table initially.

WQCD is requested to consider a better method which is to construct the wells with 40 feet of screen with 10 feet of screen below the current water table and 30 feet of screen above the current water table. This allows for the sampling the upper portion of the water table including the mounding anticipated to occur during the operation of the rapid infiltration basins. If the 20 feet of screen requirement is maintained, then nested wells should be constructed at each monitor location, nested such that a shallow sample from the top of the anticipated mound to 20 feet below the surface and a sample from the level of the current water table can be collected from the alluvial groundwater.

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Response:

Please see previous response to Comment No. 7 from CMD.

Comment No.2: Constituents Monitored

The draft permit requires CMD to collect samples from the downgradient monitor wells monthly and analyze the samples for pH, total coliform, total dissolved solids, total recoverable chromium, weak acid dissociable cyanide, dissolved iron, potentially dissolved lead, chloride, sulfate, and static water elevation. In addition, CMD must analyze the influent and effluent from the treatment plant for the presence of toxic pollutants listed in 40CFR122 Appendix D, Table II at least once every two years, and in Table III at least twice per year.

The analyses conducted by CMD during the pilot testing on the affect of the treated effluent on the groundwater only collected concentration data on fecal and total coliform bacteria, total organic carbon (TOC), total kjeldahl nitrogen (TKN), nitrite, nitrate, cryptosporidum, giardia, and viruses. The testing did not consider the possibility of dissolving constituents from the aquifer matrix caused by placing oxygenated treated effluent with a different pH and a higher TDS into the groundwater aquifer. Experience in injecting water into similar materials to the alluvial aquifer matrix indicates that metals, for example arsenic, may dissolve into the water at levels above the maximum contaminant levels.

The Black Squirrel groundwater aquifer is designated for both domestic and irrigation use. To assure that the water quality remains appropriate for these uses after the introduction of the treated sewage, monitoring for the constituents listed in Table 2 (domestic water quality standards), and Table 3 (agricultural water quality standards) of Regulation No. 41 should be required for each of the downgradient monitor wells and piezometers quarterly for the first two years and then annually. If any toxic pollutant contained in 40CFR122 Appendix D is discovered in the WWTF effluent, then it should be added to the list of compounds analyzed in the downgradient monitor wells.

Response:

Based on experience in permitting and monitoring all domestic WWTF that discharge over 2,000 gallons per day, the Division believes that the parameters listed in the draft permit, both "technology-based" from Regulation No. 62, and "water quality-based" from Regulation No. 41, are representative of a domestic WWTF. In addition to incorporating the Preliminary Effluent Limitations (PELs) into the permit, the Division included TDS at 400 mg/l, and TSS limitations. The Division believes that the monitoring parameters and respective effluent limitations will be protective of groundwater quality uses.

The monitoring for toxic pollutants in the influent and effluent is consistent with requirements in State and Federal pretreatment regulations for surface water discharges and are intended to identify additional pollutants that may have the potential to contribute to an exceedance of a water quality standard. The intent of this requirement is to identify pollutants associated with new or modified discharges from industrial users to the WWTF. The permittee is required to report any parameters identified by the monitoring that are above the method detection limit. The Division will review this information, along with any response by the permittee that may address the presence of the pollutant, including modifications to local limits or other discharge conditions imposed by the permittee on industrial users. The Division may, upon further review of all available information, require additional influent or

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effluent monitoring or pretreatment requirements in accordance with requirements in Part I.A.3 of the permit. In addition, the Division may modify the permit, in accordance with Part II.B.5.a(iv) to impose additional effluent limits for toxic parameters if it is determined the discharge endangers human health or the classified or existing uses of the receiving water.

Comment No.3: Operational Monitoring

Division Policy 96-1 requires a sufficient number of groundwater monitor wells strategically placed to monitor treatment quality, groundwater quality, and overall performance of the infiltration basins. In addition, operational monitoring including continuous monitoring of hydraulic conductivity is necessary to assure proper treatment. However, the permit does not specify data collection to evaluate the performance of the rapid infiltration basins. There are 11 separate infiltration basins that will be operated at various times. The characteristics of the treated sewage may also vary over time. Therefore, treated sewage, with varying characteristics, can be infiltrated at various locations within the facility with the distribution changing with time. In addition, the site testing conducted by CMD's contractors indicated that the infiltration rate varied considerably across a rather small area. This means that the infiltration rate can vary over a wide range between the various basins.

Evaluation of the performance and hydraulic conductivity requires recording the volume of treated sewage delivered to each infiltration basin, the time required for the water to infiltrate into the alluvium, and the resulting change in head measured beneath the infiltration basins. The permit does not require the collection of this data .

Although a continuous recording flow gauge is to be installed at the inlet to the rapid infiltration facility, the amount delivered to each infiltration basin is not required to be recorded. CMD should be required to monitor the performance of each of the 11 basins by recording the amount of treated sewage delivered to each basin, the time required for the treated sewage to infiltrate the alluvium, and the time required for drying the basin. This data should be reported as part of the monthly monitoring report.

Although the permit requires the collection of water level information during the monthly sample collection in the downgradient wells, this data is insufficient to evaluate the operation of the rapid infiltration basins. No piezometers are required to be installed and monitored beneath the rapid infiltration basins. The collection of head data during the operation of the plan and comparison of this data to CMD's predictions on how the basins will operate is necessary to validate the proper operation of the system and to confirm the predictions of no injury to downgradient users . Therefore, the installation of piezometers equipped with recording pressure transducers is an important and necessary requirement. The recommendation is that 3 piezometers be installed, one in the center of each cluster of three infiltration basins (Third Request).

Response:

CMD included a very detailed operational description of their Rapid Infiltration Basins in their Permit Application that were subject to detailed engineering review by WQCD staff before issuance of site and design approval. The permit requires the permittee to properly operate and maintain the rapid infiltration basins as stated in Part II.B.4 of the permit. While the Division has the authority to require more prescriptive operation and maintenance procedures, including performance demonstration and reporting, the Division has determined that these are unnecessary for this permit action. The Division has many other sewage systems that discharge to groundwater through rapid infiltration basins. The Division

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conducts compliance oversight on the proper operation and maintenance provision through the routine inspection process.

MacDougall, Woldridge & Worley, P.C. on behalf of the Farmer Family, Comments requested to be incorporated into the Permit Administrative Record.

Note: These comments were not prepared during the public notice process in response to the contents of the draft permit, but were previously prepared in 2006 and 2009 to address concerns about the proposed discharge facility and the PELs (prepared in June 2006) for the proposed facility. As requested these earlier materials are incorporated into the administrative record. In addition, the Division decided to provide responses to these earlier concerns.

Comment 1. The PELs do not address TDS or Boron.

Response.

Total Dissolved Solids (TDS) - While the PELs did not address TDS, the draft permit did address TDS. The permittee provided a comment on this parameter (see CMD Comment 2, above) and the Division provided a response.

Boron – The Division decided that Boron was not a pollutant of concern during the preparation of the PELs and the draft permit based on the data available. The treated effluent from the permittee's existing WWTF was tested one time for Boron and the concentration was 0.36 mg/l. According to Regulation No. 41, the water-quality standard for Boron is 0.75 mg/l for waters to be used for agricultural irrigation. Specifically, this limitation is to protect the following plants in ascending order of sensitivity: Pecan, Black Walnut, Persian (English) Walnut, Jerusalem Artichoke, Navy Bean, American Elm, Plum, Pear, Apple, Grape (Sultanina and Malaga), Kadota Fig. Persimmon, Cherry, Peach, Apricot, Thomless Blackberry, Orange, Avocado, Grapefruit, Lemon. Where a party can demonstrate that a crop watering use of groundwater is not reasonably expected, the applicable standard for Boron is 5.0 mg/l. The above materials for the permit record only identified corn as the crop and not any of the above Boron-sensitive crops. Thus, the Division decided that the Boron concentration in the treated wastewater would be significantly below the 5.0 mg/l standard and there is no reasonable concern about potential impairment of the water for potential use in irrigation.

The permittee furnished the Division data on the Boron concentrations in the local groundwater below the proposed infiltration basins. Groundwater samples were collected from nine (9) drinking water wells located throughout the Black Squirrel Alluvial Aquifer, in July 2009. Two (2) wells, identified as DW-Well 11-09, and DW-Well 12-09, are the two up-gradient and/or background groundwater monitoring wells identified as 050A and 050B in the CMD Permit. These two wells are used for measuring background groundwater quality parameters. All nine wells were sampled for Boron, with a range of 0.04 mg/l—0.08 mg/l. The results for both up-gradient wells for Boron were 0.05 mg/l. Based on these data, the ambient groundwater quality is below the water quality standard.

The Division decided to require limited monitoring of Boron at Compliance Point 001A to confirm that Boron in the treated effluent from the new plant is not significantly different from the concentration in the one sample.

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Comment 2. The PELs are flawed as they are not based on actual data concerning the concentrations of many of the constituents in the wastewater stream nor has any site-specific data been collected regarding the treatment demonstration of the soils.

Response.

PELs are the first step in the site approval process and are intended to determine the regulatory requirements for a proposed new or increased discharge. The ability for a facility to meet those requirements is evaluated in the site and design approval steps of the process. For proposed facilities actual data is not available for the treated effluent to be discharged and the Division completes an evaluation of the proposed design and operation of the new treatment plant before deciding on the ability of the plant to meet the PELs. Site approval was granted to this facility on the basis that adequate demonstrations had been made that the facility could meet the effluent limits contained in the PELs.

Comment 3. An effective monitoring plan and system is a necessity.

Response. See responses to previous comments regarding monitoring well design.

Comment 4. The interaction of the CMD's treated wastewater with the alluvial matrix during the infiltration may result in an increase of certain constituents in the groundwater, including arsenic, uranium, calcium, sodium, cobalt, etc.

Response. The Water Quality Control Commission (WQCC) has adopted interim standards for 145 organic chemicals that are currently considered of importance relative to protecting groundwater quality and its various beneficial uses. These organic chemicals are listed in Table A of Regulation No. 41. In August 2004, the CMD collected effluent samples from their existing lagoon treatment facility and from the Paint Brush Hills (PBH) lagoon treatment facility. These samples were analyzed for approximately 130 parameters, which included metals and organic chemicals. This testing included analysis for approximately 60 of the 145 organic chemicals contained in Table A. The results of these analyses indicated that, with the exception of Di(2-ethylhexyl)phthalate (DEHP), none of the 60 parameters were detected at concentrations above the method detection limit (MDL).

The results for the other organic chemicals that were analyzed, those not included in Table A, indicate that none of them were detected at concentrations exceeding the MDL. In all analyses, the MDLs were below the groundwater quality standard concentrations listed in Table A of Regulation 41 or respective drinking water MCLs. Based on the organic chemical analyses conducted, it is unlikely that the other parameters listed in Table A would be found present in the WWTF's effluent. In addition, the CMD has had an EPA approved pretreatment program in place since 1997 under which commercial and industrial discharges to the wastewater collection system are regularly monitored and regulated.

The CMD is expected to maintain a proactive program with respect to water quality issues. In the event any constituents are monitored and begin to elevate toward unacceptable concentrations, the CMD will evaluate potential sources of the constituent and the means of limiting its introduction. The CMD has established and maintains an ongoing program of monitoring industrial users to ensure that water quality discharged from them to the wastewater collection system does not represent any unacceptable levels of pollutants of concern.

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Based on the sampling and analysis performed by CMD, and CMD's Pretreatment Program, the Division believes that the reclaimed water (treated effluent) from the CMD Water Reclamation Facility that will be applied to the rapid infiltration basin system, and subsequently migrate into and comingle with native ground water in the Black Squirrel Creek Alluvial Aquifer, will not cause unreasonable impairment of water quality or designated beneficial uses of the groundwater, and will not exceed current ground water quality standards as promulgated by the WQCC.

Other Changes

On March 3, 2010, the Division received an amendment from CMD to the Permit Application requesting a name change from the "Black Squirrel Wastewater Treatment Facility" to the "Cherokee Metropolitan District Water Reclamation Facility." The Division has made this change in the Permit and Fact Sheet.

Based on further evaluation by the Division, it was determined that the regulatory basis identified in the pretreatment requirements in the public noticed permit was not applicable to the Cherokee Metropolitan District Water Reclamation Facility. The requirements were based on authority and conditions of State and EPA pretreatment regulations, 5 CCR 1002-63 and 40 CFR Section 403.8 respectively, that are applicable only to facilities that discharge to surface waters. The pretreatment requirements in Part I.A.3 have been revised to instead be based on authority in 5 CCR 1002-61, that requires practice based effluent limits in CDPS permits when reasonably necessary to achieve effluent limitations and standards. Although the permit language has been revised to address this change in authority, the requirements for implementation by the permittee have remained consistent with those included in the public noticed permit.

The Division corrected an administrative error and modified the permit to express the effluent limits implemented to protect the nitrate standard in groundwater as Total Inorganic Nitrogen (TIN).

Randy Ogg
Permit Writer
May 7, 2010

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COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

RATIONALE FOR AMENDMENT NO. 1

Cherokee Metropolitan District Water Reclamation Facility

CDPS PERMIT NUMBER COX-048348, EL PASO COUNTY

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I. TYPE OF PERMIT	*Major Amendment #1*
II. FACILITY INFORMATION	
A. Facility Type:	*Domestic-Major Municipal, Mechanical Plant*
B. Facility Classification:	*4952 Sewerage Systems* *Class A per Section 100.5.2 of the Water and Wastewater Facility Operator Certification Requirements*
C. Fee Category 1:	*Domestic Wastewater-Mechanical Plant, Category 21, Subcategory 7*
Category Flow Range:	*Sewage from 2,500,00 up to 9,999,999*
Annual Fee:	*$11,410 effective July 1, 2007*
Amendment Fee:	*$307.50*
D. Legal Contact:	*Sean Chamber, General Manager* *Cherokee Metropolitan District* *6250 Palmer Park Blvd.* *Colorado Springs CO 80915-1712* *719-597-5080*
E. Facility Contact:	*Pete Heidebrecht, Certified Operator* *719-597-5080, e-mail pheidebrecht@cherokeemetro.org.*
F. Facility Location:	*19174 Drennan Rd., Colorado Springs, CO 80930* *WWTF Lattitude: 38° 45 12″ N, Longitude: 104° 28 26″ W;* *Rapid Infiltration Basins Lattitude:* *38° 44″ 25 N, Longitude: 104° 24 14″ W*
G. Discharge Point:	*Outfall 001A, following disinfection and prior to mixing with the receiving aquifer* *Outfalls 050C(L), 050D(L) (down-gradient compliance wells)*

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III. PURPOSE OF AMENDMENT

In a letter dated January 27, 2011, Cherokee Metropolitan District (CMD) requested an extension to their compliance schedule included in Part I.3.b.v of their discharge permit concerning actions relative to examination of the pretreatment program local limits. This condition of the permit requires the CMD to submit a technical evaluation of the need to revise or develop local limits by June 1, 2011. In addition, should the CMD find that there is a need to revise or develop local limits; the CMD is to submit the proposed local limits by June 1, 2011.

Evaluation of existing local limits together with an analysis for requirements for new local limits is dependent, in large part, upon the ability of the Water Reclamation Facility to remove constituents of concern. Since this is a new facility, the District did not have any performance data at the time of issuance of this permit. Since the initiation of commissioning the new facility in June 2010, and the progress made toward development of suitable activated sludge operating conditions, the facility has a very limited period of stable operation. The facility has experienced certain slug discharges from a non-residential user which has affected treatment plant operation. In order to properly assess the need for revised and/or new local limits, additional data regarding treatment plant capabilities and performance is necessary.

IV. CHANGES MADE AS A RESULT OF THE AMENDMENT

The Division agrees with changing the compliance schedule. The following language shall be incorporated into the amended permit: "The permittee shall submit to the Division a technical evaluation of the need to revise or develop local limits in accordance with 40 CFR 403.5©, by December 31, 2011. The evaluation shall include, but not be limited to, a consideration of any new or revised numeric and practice-based effluent limits in this permit and water quality standards for the receiving water. If a technical evaluation reveals that development of revision of local limits is necessary, the permittee shall submit the proposed local limits to the Division on or before June 1, 2012, and implement the new local limits within 12 months of approval by the Division."

Permit Writer:
Randy T. Ogg
March 31, 2011

V. PUBLIC NOTICE COMMENTS

There were no public comments received from the public notice period.

Permit Writer
Randy T. Ogg
October 2011

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COLORADO DISCHARGE PERMIT SYSTEM (CDPS)

RATIONALE FOR AMENDMENT NO. 2

Cherokee Metropolitan District Water Reclamation Facility

CDPS PERMIT NUMBER COX-048348, EL PASO COUNTY

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I. TYPE OF PERMIT — Major Amendment #2

II. FACILITY INFORMATION

A. Facility Type: Domestic-Major Municipal, Mechanical Plant

B. Facility Classification: 4952 Sewerage Systems
Class A per Section 100.5.2 of the Water and Wastewater Facility Operator Certification Requirements

C. Fee Category 1: Domestic Wastewater-Mechanical Plant, Category 21, Subcategory 7
Category Flow Range: Sewage from 2,500,00 up to 9,999,999
Annual Fee: $11,410 effective July 1, 2007
Amendment Fee: $307.50

D. Legal Contact: Sean Chamber, General Manager
Cherokee Metropolitan District
6250 Palmer Park Blvd.
Colorado Springs CO 80915-1712
719-597-5080

E. Facility Contact: Pete Heidebrecht, Certified Operator
719-597-5080, e-mail pheidebrecht@cherokeemetro.org.

F. Facility Location: 19174 Drennan Rd., Colorado Springs, CO 80930
WWTF Lattitude: 38° 45 12″ N, Longitude: 104° 28 26″ W;
Rapid Infiltration Basins Lattitude:
38° 44″ 25 N, Longitude: 104° 24 14″ W

G. Discharge Point: Outfall 001A, following disinfection and prior to mixing with the receiving aquifer
Outfalls 050C(L), 050D(L) (down-gradient compliance wells)

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III. PURPOSE OF AMENDMENT

In a letter dated October 18, 2011, Cherokee Metropolitan District Water Reclamation Facility requested an Amendment of CDPS Permit Number COX-048348. Specifically, the request for the amendment included: Compliance Schedule for Total Dissolved Solids as "Report Only" for the duration of the permit; and Compliance Schedule for 85% Removal of BOD and TSS as Report Only from November 1, 2011 through January 1, 2014.

IV. CHANGES MADE AS A RESULT OF THE AMENDMENT

The Water Quality Control Division (Division) denies the request from Cherokee Metropolitan District to amend its permit for a "compliance schedule" for Total Dissolved Solids and 85% removal for BOD and TSS limitations as report only. Therefore, no changes to this permit shall be made.

Background. A preliminary effluent limit (PEL) was issued for discharges from the facility to Upper Black Squirrel Creek alluvial groundwater on June 16, 2006. The PEL included numeric effluent limits and an 85% removal requirement for BOD and TSS. The PEL did not include an effluent limit for TDS.

The facility received site approval in 2006 and design approval in February 2007. Construction of the facility began in 2007. The Division received a permit application for discharges from the facility to Upper Black Squirrel Creek alluvial groundwater on August 21, 2009. The Division published a draft permit for public notice and comment on March 19, 2010, and issued a final permit on May 13, 2010. The final permit became effective on June 12, 2010.

Since a TDS limit was not included in the June 2006 PEL, the ability of the treatment plant to meet the TDS limit was not evaluated during the site and design approval process. During the development of the draft and final permit, however, the Division evaluated whether the effluent limit for TDS could be met. As documented in the Fact Sheet for the final permit, the Division confirmed with the Cherokee Metropolitan District that the facility would be able to meet the TDS limit.

As described in the Division's Compliance Schedule Policy (WQCD, 2010), the use of compliance schedules for new and recommencing discharges is extremely limited:

> Regulation 61.8(3)(n)(iii) states: "The first permit issued to a new source or a new discharger shall contain a schedule of compliance only when necessary to allow a reasonable opportunity to attain compliance with requirements issued or revised after commencement of construction but less than three years before commencement of the relevant discharge."
>
> Regulation 61.8(1)(b)(iii) states: "The Division shall not issue a permit under the following circumstances: . . . (iii) When the imposition of conditions cannot ensure compliance with applicable water quality requirements of all affected States."

The proposed TDS limit in the draft permit is considered a limit that was issued or revised after commencement of construction and less than three years before commencement of the relevant discharge. However, given the prohibition of issuing a new permit when conditions cannot ensure compliance with water quality requirements, the Division was considering permit denial if Cherokee Metropolitan District was not able to demonstrate the ability to meet the TDS limit. The Division relied on information provided by the District regarding the Facility's ability to meet the TDS limit to support permit issuance in lieu of permit denial. Under these circumstances, the Division did not further consider the allowance of a compliance schedule for TDS because it was determined to be unnecessary.

The Division did not consider a compliance schedule in the issuance action for the 85% removal requirement for BOD and TSS as this requirement was included in the PEL and addressed in site and design approval. It was presumed that the facility would be able to meet the 85% removal requirement at the commencement of discharge.

Discharges from the Cherokee Water Reclamation Facility Rapid Infiltration Basins to Upper Black Squirrel Creek alluvial groundwater commenced in June 2010. Following commencement of the discharge, the facility has had numerous permit violations for exceedances of effluent limitations and 85% removal

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requirements for BOD and TSS, and the effluent limit for TDS. The request for a permit modification to include a compliance schedule for the 85% removal requirement for BOD and TSS, and the TDS effluent limit was received in October 2011.

Basis for Denial of Permit Modification Request. The Division has determined that discharges from the Cherokee Metropolitan District Water Reclamation Facility Rapid Infiltration Basins to Upper Black Squirrel Creek alluvial groundwater is currently an existing discharge.

The 85% removal requirement for BOD and TSS, and the TDS effluent limit of 400 mg/L remain appropriate conditions for this permit. The 85% Rate of Removal for BOD and TSS are standard limitations in Regulation #62, Regulations for Effluent Limitations. These regulations and limitations are applicable to all domestic wastewater dischargers. The applicable water quality standard for Total Dissolved Solids (TDS) is 400 mg/L, in accordance with Regulation No. 41, The Basic Standards for Ground Water. Secondly, the "Upper Black Squirrel Creek Alluvial Aquifer" is a "designated" aquifer in accordance with Regulation No. 42. The Upper Black Squirrel Creek Alluvial Aquifer is classified as "domestic use-quality and agriculture use-quality." The groundwater quality standards included in Tables 1-4 of the "Basic Standards for Ground Water" 41.0 (5CCR 1002-41) are assigned to all unconfined ground water in the specified area. Table 4 in Regulation No. 41 includes a TDS effluent limitation of 400 mg/L, and is applicable to the Cherokee Metropolitan District Water Reclamation Facility.

On this basis, a compliance schedule is not appropriate at this time for 85% removal for BOD and TSS or for the TDS effluent limitation, as the appropriate permit conditions are not new or more stringent (WQCD, 2010).

In support of this permit modification denial action, the Division evaluated whether the facility would have been eligible for a compliance schedule for TDS at the time of permit issuance if TDS had been more fully characterized by the facility and more complete information had been included in the permit application documenting an inability to meet the proposed limit of 400 mg/L.. This was done to further consider the unique factors in this case in making a compliance schedule appropriateness determination. In this case the Division has determined that the discharge from the Cherokee Metropolitan District Water Reclamation Facility Rapid Infiltration Basins was a new discharger at the time of permit issuance, since the discharge was occurring at a new site (the rapid infiltration basins) to a new water area (groundwater). Therefore, the facility would have been eligible for a compliance schedule for TDS at the time of permit issuance only if the permit required actions to be taken to enable the facility to meet the TDS effluent limit upon commencement of discharge, and prohibited discharge in advance of those actions being completed. Alternatively, if the Division had information substantiating the inability of the facility to meet the effluent limit for TDS upon commencement of discharge, without any countering information regarding steps that could be taken to meet effluent limit upon commencement of discharge, the appropriate course of action would have been to delay permit issuance until such time as new information would be provided to demonstrate the ability to meet the effluent limit. As a result, the Division has determined that new information regarding the inability of the facility to meet the effluent limit for TDS does not factor into the appropriateness determination.

Permit Writer:
Randy T. Ogg
December 28, 2011

V. REFERENCES

A. Colorado Discharge Permit System Regulations, Regulation No. 61, Colorado Department of Public Health and Environment, Water Quality Control Commission, effective April 30, 2008.

B. Policy for Permit Compliance Schedules, Colorado Department Public Health and Environment, Water Quality Control Division Policy Number WPC-Permitting -2, effective December 2, 2010.

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VI. PUBLIC NOTICE COMMENTS

No comments were received during the public notice period, from January 20, 2012 through February 20, 2012. Therefore, no further action is required for this permit amendment.

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Permit File COX-0048348

Randy Ogg

STATE OF COLORADO

Bill Ritter, Jr., Governor
James B. Martin, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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June 9, 2008

Kip Petersen, Manager
Cherokee Metropolitan District
6250 Palmer Park Boulevard
Colorado Springs, CO 80915

Subject: Design Approval (Plans and Specifications) for New Wastewater Treatment Facility, Site Application #4823, Cherokee Metropolitan District, El Paso County

Dear Mr. Peterson:

The Water Quality Control Division (the Division) has received the above referenced design documents, which were submitted on your behalf by GMS, Inc. The design documents were reviewed for compliance with Policy 96-1, Design Criteria Considered In The Review of Wastewater Treatment Facilities (the design criteria).

The design documents are associated with the above referenced site application for the Cherokee Metropolitan District's proposed wastewater treatment facility (WWTF), which is specified for a maximum monthly average hydraulic capacity of 4.800 MGD, and an associated organic capacity of 8,835 lbs BOD_5/day. A material and equipment approval for the 24-inch interceptor sewer, 20-inch nonpotable water main, yard piping and appurtenances at the recharge basin facility, and Sequencing Batch Reactor (SBR) equipment was authorized on January 9, 2007. The design review for the recharge facility and 20-inch nonpotable water main was approved on February 21, 2007.

This phase of the project includes the following:

- Installing the Owner furnished equipment for a SBR WWTF.
- Headworks Building, UV Disinfection Building, Digester Building, Solids Handling Building, Operations Building, and Electrical Equipment Building.
- Four SBR basins, two flow equalization basins, three aerobic digester basins, two biosolids day tanks.
- Yard piping, influent and effluent 18-inch Parshall flumes with ultrasonic flow meters, dirt work, asphalt pavement, and various appurtenances associated with the project

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The design documents are approved subject to the following conditions:

1. Chapter 4.6.2 of the design criteria requires that all WWTF shall be furnished a suitable manual that describes the overall operation and maintenance including process operations and controls. Prior to operation of the WWTF, an Operations & Maintenance Manual (O&M Manual) must be developed for the District.
2. In accordance with Regulation No. 100, Water And Wastewater Facility Operators Certification Requirements, this facility is required to be under the supervision of a operator that holds a Class "A" Domestic Wastewater Treatment Facility certification.
3. All change orders and addenda must be submitted to this office in duplicate for approval. Upon approval, one copy will be returned to you.
4. The registered engineer on the project must furnish a statement prior to commencement of operation stating that the facilities were constructed according to the plans, specifications, and change orders approved by the Division.
5. This review does not relieve the owner from compliance with all federal, state, and local government regulations prior to construction nor from responsibility for proper engineering, construction, and operation of the facility.
6. Once bids have been opened, the following documents should be submitted to the Water Quality Control Division, Outreach & Project Assistance Unit project manager :
   - A certified tabulation of all bids received.
   - Proof of advertising indicating circulation dates and time for receipt of bids.
   - A copy of the executed construction contract and schedule. Please note that the contractor must maintain adequate fire and extended coverage, workers' compensation, public liability, property damage and "all risk" builders insurance (including blasting where appropriate) during the construction phase of the contract.
   - Submit completed "FORM A – MBE/WBE SUBCONTRACTOR SOLITATION INFORMATION" as provided in the boilerplate specifications document, including a copy of their MBE/WBE certification.
   - During the construction phase, the borrower and contractor are required to complete "FORM B – MBE/WBE PROCUREMENTS MADE DURING THE QUARTER" as provided in the boilerplate specifications. These forms must be submitted to the Water Quality Control Division Project Manager beginning with the fiscal quarter that the bid is awarded and continuing until the project is completed. These reports must be submitted within 20 days of the end of the Federal fiscal quarter or by January 20, April 20, July 20, and October 20.
   - A final Plan of Operation and a draft Operations and Maintenance Manual is required to be submitted for review and approval by 50% of construction. The final Operations and Maintenance Manual is due for submittal and approval at 90% completion of construction, prior to final payment from the Water Pollution Control Revolving Loan.
7. A pre-construction conference must be held prior to initiating construction to discuss progress payments, change order procedures, progress meetings and compliance with Federal and State

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Regulations e.g., Civil Rights (Title VI), Equal Employment Opportunity, Occupational Safety and Health Administration and the National Historic Preservation Act/Archeological and Historic Preservation Act. Please contact Carolyn Schachterle at 303-692-3551 at your earliest convenience regarding our attendance and suggested agenda.

8. When the facility is estimated to be within 30 days of completion, the Division must be notified. A representative of the Division will schedule a site visit to conduct a final construction inspection.

Attached to this letter you will find a Customer Satisfaction Survey. We would greatly appreciate it if you would take a few moments to complete this survey and return it to us. Simply fill out the form, fold it according to the directions and drop it in the mail. The postage is already paid.

Thank you for your time and cooperation in this matter. If you have any questions, I can be contacted at 719-545-4650, ext. 13, or via email at dave.knope@state.co.us.

Sincerely,

David W. Knope, P.E.
District Engineer
Engineering Section
Water Quality Control Division
Colorado Department of Public Health and Environment

cc: Art Sintas, Cherokee Metropolitan District
Ed Meyer, P.E., GMS, Inc.
Mike McCarthy, El Paso County Department of Health and Environment
Richard Muzzy, Pikes Peak Area Council of Governments
Carl Schueler, El Paso County Development Services Department
Kent Kuster, Engineering Section, WQCD - Denver
Carolyn Schachterle, Outreach and Project Assistance Unit, WQCD – Denver

ec: Greg Worden, P.E., GMS, Inc.
David Akers, P.E., Clean Water Facilities Program, WQCD - Denver
Andrew Ross, Permit Section, WQCD - Denver
Lynn Kimble, Permit Section, WQCD - Denver

dwk

CHEROKEE METROPOLITAN DISTRICT

RESOLUTION 2018 - 03

A RESOLUTION OF THE BOARD OF DIRECTORS OF THE CHEROKEE METROPOLITAN DISTRICT INCLUDING CERTAIN REAL PROPERTY INTO THE BOUNDARIES OF THE DISTRICT

A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89°46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

WHEREAS, a Petition for Inclusion of real property into the Cherokee Metropolitan District ("District") has been received from Dayton & Leah Osborn (Trustees), as owner of the property described in **Exhibit A** attached hereto and incorporated herein;

WHEREAS, said Petition complies with all requirements of C.R.S. § 32-1-401, *et seq.*;

WHEREAS, notice of public hearing on said inclusion has been published in the Ranchland News in the form prescribed by C.R.S. § 32-1-401(1)(b);

WHEREAS, no person showed cause in writing, and no person appeared in person to show cause orally, why the Petition should not be granted;

WHEREAS, it is in the best interests of the property owner and the users of the District to grant the within inclusion.

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Cherokee Metropolitan District as follows:

1. The Petition of Dayton & Leah Osborn (Trustees) for the inclusion of the real property described in **Exhibit A** attached hereto and incorporated herein into the boundaries of said Cherokee Metropolitan District is hereby granted in its entirety.

2. Staff and legal counsel, on behalf of the Board of Directors, are directed to prepare and submit to the District Court in and for the County of El Paso County, State of Colorado, all necessary and appropriate petitions and orders to legally effect the within inclusion.

DONE AND RESOLVED this 13th day of March, 2018.

CHEROKEE METROPOLITAN DISTRICT

By: _____
Janet L. Cederberg, President

ATTEST:

_____
Melody Helton, Secretary

CHEROKEE METROPOLITAN DISTRICT

NOTICE OF PUBLIC HEARING
PETITION FOR INCLUSION

NOTICE IS HEREBY GIVEN that the Board of Directors of the Cherokee Metropolitan District will hold a public hearing at its regular meeting on March 13, 2018 at 1:00 p.m., at the District's offices, located at 6250 Palmer Park Blvd., Colorado Springs, CO 80915 on a Petition for Inclusion, as described below.

Petitioners:
Dayton and Leah Osburn (Trustees)
P.O. Box 154
Chino Hills, CA 91709

General Description of Area Proposed for Exclusion:
A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89°46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

Thence the following four (4) courses:

1. Along said east right-of way line of Curtis Road N00°15'10"W a distance of 656.56 feet to intersect the north line of the aforesaid parcel.
2. Along the north line of said parcel N89°07'42"E a distance of 10.00 feet to intersect a line drawn parallel to and 40.00 feet east of the west line of said Section 15.
3. Along said parallel line S00°15'10"E a distance of 656.39 feet to intersect the south line of the aforesaid parcel.
4. Along said south line S89°52'39"W a distance of 10.00 feet to the Point of Beginning.

#7

NOTICE IS FURTHER GIVEN that all interested persons shall appear at the above designated date, time and place and provide comments on why the Petition for Inclusion should not be granted. Written comments may be submitted by the designated date and time above at the District's offices. Failure of any person within Cherokee Metropolitan District to object shall be taken as assent on his or her part to the Inclusion of the area described above.

Respectfully submitted,
Kurt Schlegel, General Manager

CHEROKEE METROPOLITAN DIST

6250 Palmer Park Blvd, Colorado Springs, CO 80915-1721
Telephone: (719) 597-5080 FAX: (719) 597-5145

PETITION FOR THE INCLUSION OF REAL PROPERTY IN THE CHEROKEE METROPOLITAN DISTRICT

To: The Board of Directors of Cherokee Metropolitan District

The undersigned Petitioner(s): * _____, being the fee owner(s) of the real property hereinafter described, hereby petition(s) that the hereinafter described real property be included in the Cherokee Metropolitan District ("District"), and in support of this Petition state(s) and represent(s) as follows:

1. That such property is capable of being served with facilities of the District.

2. That assent to the inclusion of such property in the District is hereby given by the undersigned, who constitute all the fee owners of such property.

3. That there shall be no withdrawal from this petition after consideration by the Board, nor shall further objections be filed thereto by Petitioner(s).

4. That the inclusion of such property in the District shall be subject to any and all terms and conditions established by the Board and accepted by Petitioner (s) and to all duly promulgated rules, regulations and rates of the District.

5. That the property owned by Petitioner(s) and sought to be included in the District is accurately described as follows:

(see attached Exhibit A for the Legal Description of property)

* DAYTON ORSBURN AND LEAH ORSBURN AS CO-TRUSTEES OF THE JLO TRUST U/T/A DATED AUGUST 1, 1991

PETITIONER

DAYTON ORSBURN
Name

PO BOX 154
Address

CHINO HILLS, CA 91709

Signed

DAYTON ORSBURN, TRUSTEE
Printed Name, Title

PETITIONER

LEAH ORSBURN
Name

PO BOX 154
Address

CHINO HILLS, CA 91709

Leah Orsburn
Signed

LEAH ORSBURN, TRUSTEE
Printed Name, Title

STATE OF COLORADO)
) SS.
COUNTY OF_____)

The foregoing instrument was acknowledged before me this _____ day of _____, 20___, by _____ _____, of _____.

Witness my hand and official seal.

My Commission Expires: _____

_____
Notary Public

PLEASE SEE ATTACHED

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT **CIVIL CODE § 1189**

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of San Bernardino)

On January 8, 2018 before me, Jennifer N. Vincze, Notary Public
Date *Here Insert Name and Title of the Officer*

personally appeared Dayton Orsburn and Leah Orsburn
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

JENNIFER N. VINCZE
Commission # 2083451
Notary Public - California
San Bernardino County
My Comm. Expires Oct 24, 2018

Signature _____
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: _____	Signer's Name: _____
☐ Corporate Officer — Title(s): _____	☐ Corporate Officer — Title(s): _____
☐ Partner — ☐ Limited ☐ General	☐ Partner — ☐ Limited ☐ General
☐ Individual ☐ Attorney in Fact	☐ Individual ☐ Attorney in Fact
☐ Trustee ☐ Guardian or Conservator	☐ Trustee ☐ Guardian or Conservator
☐ Other: _____	☐ Other: _____
Signer Is Representing: _____	Signer Is Representing: _____

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APPENDIX F – CORRESPONDENCE WITH CMD
COC No. MC-140514-1

CHEROKEE METROPOLITAN DISTRICT

6250 Palmer Park Blvd., Colorado Springs, CO 80915-2842
Telephone: (719) 597-5080 Fax: (719) 597-5145

June 14, 2018

Ms. Adrienne Angelos, E.I.T.
c/o Element Engineering LLC
12687 W. Cedar Drive
Suite 300
Lakewood, CO 80228

Ms. Angelos,

As requested Cherokee staff have completed the attached Wastewater Receiving Entity Certification for your application to the State regarding the Arrowhead Mobile Home Park.

Cherokee has the capacity at the District's Water Reclamation Facility to receive and treat the wastewater flows anticipated and projected from the Arrowhead Mobile Home Park.

At this time, I am unable to certify that the District's wastewater treatment facility is not in violation of any effluent limits specified in the facility's discharge permit since Cherokee is working to address a Compliance Order on Consent (COC), Number MC-140514-1, with the Colorado Department of Public Health and Environment (CDPHE). Important to note however is that our staff is confident that the anticipated and projected additional flows and loading to be received from the Arrowhead Mobile Home Park will not materially alter the status of the COC.

If I may be of further assistance, please do not hesitate to contact me at your convenience.

Sincerely,

Jonathon Smith
Water & Wastewater Collections Manager

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COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

DIVISION OF ADMINISTRATION

WATER QUALITY CONTROL DIVISION

COMPLIANCE ORDER ON CONSENT **NUMBER: MC-140514-1**

IN THE MATTER OF: **CHEROKEE METROPOLITAN DISTRICT**
CDPS PERMIT NO. COX–048348
EL PASO COUNTY, COLORADO

The Colorado Department of Public Health and Environment ("Department"), through the Water Quality Control Division ("Division"), issues this Compliance Order on Consent ("Consent Order"), pursuant to the Division's authority under §§25-8-602 and 605, C.R.S. of the Colorado Water Quality Control Act ("the Act") §§25-8-101 to 803, C.R.S., and its implementing regulations, with the express consent of Cherokee Metropolitan District ("Cherokee"). The Division and Cherokee may be referred to collectively as "the Parties."

STATEMENT OF PURPOSE

1. The mutual objectives of the Parties in entering into this Consent Order are:

    a. To establish compliance requirements and criteria for the continued operation of Cherokee's Wastewater Reclamation Facility located at or near 19174 Drennan Road, El Paso County, Colorado Springs, Colorado (the "Facility"); and

    b. To resolve, without litigation, the alleged violations of the Act cited herein by the Division, and the associated civil penalties.

DIVISION'S FINDINGS OF FACT AND DETERMINATION OF ALLEGED VIOLATIONS

2. Based upon the Division's investigation into and review of the compliance issues identified herein, and in accordance with §§25-8-602 and 605, C.R.S., the Division has made the following determinations regarding Cherokee, the Facility and Cherokee's compliance with the Act and its Colorado Discharge Permit System ("CDPS") permit.

3. At all times relevant to the alleged violations cited herein, Cherokee was a "Special District" formed in El Paso County, Colorado pursuant to the Colorado Special District Act, §§32-1-101 et seq and 32-4-501 et seq, C.R.S.

4. Cherokee is a "person" as defined by §25-8-103(13), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2(73).

5. The Facility receives and treats approximately 1.59 million gallons per day of domestic sewage generated from the Cimarron Hills area of Colorado Springs, El Paso County, Colorado and from two (2) contract customers: Meridian Service Metropolitan District and Schriever Air Force Base.

6. The Facility consists of a mechanical treatment plant that includes an extended aeration activated sludge biological process, utilizing four sequencing batch reactors for carbon oxidation, nitrification and denitrification, followed by effluent flow equalization, and ultraviolet disinfection. Waste activated sludge is aerobically digested and dewatered utilizing centrifuges. Treated effluent from the Facility is conveyed to a rapid infiltration basin system, approximately four (4) miles east-southeast, and consisting of ten (10) individual infiltration basins.

7. On August 21, 2009, Cherokee applied for coverage under a CDPS individual ground water discharge permit for Discharges to Ground Water from Domestic Wastewater Treatment Works (the "Permit").

8. On May 13, 2010, the Division issued Cherokee Individual Permit Number COX-048348 authorizing Cherokee to discharge effluent wastewater from the Facility to groundwater under the terms and conditions of the Permit. The Permit became effective on June 12, 2010 and is due to expire May 31, 2015.

9. Cherokee commenced operations at the Facility in June 2010 and has continuously operated since that date.

10. The Permit specifies that Cherokee is authorized to discharge effluent wastewater from the Facility to groundwater (Upper Black Squirrel Alluvial Aquifer). No other discharges are authorized by the Permit. The discharge is subject to the specific effluent limitations and other conditions of the Permit.

11. Groundwater is "state waters" as defined by §25-8-103(19), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2 (101).

12. Section 61.8, 5 CCR 1002-61, states in part that "A permittee must comply with all the terms and conditions of the permit."

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Failure to Comply with Permit Effluent Limitations

13. Pursuant to Part 1.A.1 of the Permit, the discharge from the Facility at outfalls 001A, 050C(L), and 050D(L) should not have exceeded, among other parameters and limitations not listed herein, the effluent limitations specified below:

Point of Compliance	Effluent Parameters	Discharge Limitations			
		30-Day Average	7-Day Average	Monthly Minimum	Daily Maximum
Outfall 001A	5-Day Biochemical Oxygen Demand ("BOD_5") (mg/L)	30 mg/L	45 mg/L	-	-
Outfall 001A	BOD_5 Removal (%)	-	-	85%	-
Outfall 001A	Total Suspended Solids ("TSS") (mg/L)	30 mg/L	45 mg/L	-	-
Outfall 001A	TSS Removal (%)	-	-	85%	-
Outfall 001A	Total Inorganic Nitrogen ("TIN") (mg/L)	-	-	-	10 mg/L
Outfalls 050C(L) and 050D(L)	Total Dissolved Solids ("TDS") (mg/L)	400 mg/L	-	-	-

Each point of compliance shown in the above table is as directed in CDPS Permit No. COX-048348 effective June 12, 2010:

a) Outfall 001A = The Facility's outfall following ultraviolet radiation disinfection and prior to the effluent being conveyed by pipeline to the rapid infiltration basins and mixing with the receiving water.

b) Outfalls 050C(L) and 050D(L) = Downgradient monitoring wells located within fifteen (15) feet of the southern (downgradient) boundary of the Facility's property where the rapid infiltration basins are located.

14. Pursuant to Part I.D.1 of the Permit, to provide an indication of the quality of the wastewater being discharged into the Upper Black Squirrel Alluvial Aquifer, Cherokee collects specific samples of the effluent at the monitoring locations specified in the Permit. The analytical results of the samples are summarized and reported to the Division via monthly Discharge Monitoring Reports ("DMRs") which include a certification by Cherokee affirming that the information provided therein is true, accurate and complete, to the knowledge and belief of Cherokee.

15. Cherokee's DMRs submitted to the Division include, among other information and data, the effluent concentration summary data for BOD_5, BOD_5 Removal, TSS, TSS Removal, TIN, and TDS which

exceeded the effluent limitations imposed by Part I.A.1 of the Permit. These effluent violations are attached as Exhibit A.

16. BOD_5, BOD_5 Removal, TSS, TSS Removal, TIN, and TDS are each a "pollutant" (or indicator thereof) as defined by §25-8-103(15), C.R.S. and its implementing permit regulation, 5 CCR 1002-61, §61.2 (76).

17. The Permit did not authorize the pollutant discharge levels identified above in paragraph 15 and in Exhibit A and Cherokee does not have any other permits authorizing such discharge into State Waters.

18. Cherokee's failure to comply with the effluent limitations set forth in the Permit and identified above in paragraph 15 and Exhibit A constitutes alleged violations of Part I.A.1 of the Permit.

Cherokee's Position on Alleged Violations

19. Cherokee submitted a request for preliminary effluent limitations ("PELs") for the proposed discharge of the Facility to groundwater through rapid infiltration basins on May 2, 2006. The Division responded with a letter dated June 15, 2006 stating the PELs which would apply to that discharge to groundwater. The PELs presented by the Division in the June 15, 2006 letter did not include TDS as an effluent limit for this discharge. Cherokee accomplished the design and preparation of construction documents in accordance with the PELs set forth in the June 15, 2006 letter. The subsequent site location approval and construction documents approval by the Division for the Facility did not include any statements regarding a requirement for meeting a TDS effluent limit. TDS was presented by the Division as an effluent limit parameter in a draft discharge permit following Cherokee's application for a discharge permit on August 14, 2009. Even though the Facility was not designed or constructed to remove or otherwise control TDS in the effluent, the Division issued a draft permit for public review on March 19, 2010, and a final permit effective June 12, 2010, containing effluent limits for TDS.

20. In response to the TIN discharge permit violations occurring in early 2011, Cherokee's initial investigations indicated that the anoxic treatment periods may not have been long enough and the process may be carbon deficient. Cherokee implemented process changes to increase the anoxic treatment periods and experimented with feeding supplemental carbon, in the form of methanol, during the anoxic periods. These process modifications initially showed positive results, with the effluent TIN concentration steadily dropping from 34.0 mg/L in March 2011 to 11.8 mg/L in June 2011. Cherokee was in the process of installing equipment that would allow methanol to be fed on a more consistent basis to improve the performance of the denitrification process in June 2011 when the Division informed Cherokee that adding methanol would likely be a change in the treatment process and therefore require an amendment to the site location approval and design, plan and specification review and approval by the Division. Cherokee advocated the immediate implementation of a methanol feed and expressed its concern to the Division that the effluent would not be in compliance with the TIN limitation until process modifications could be implemented. Cherokee's *Pilot/Full Scale Demonstration Project – Methanol Addition as a Carbon Source* was authorized by the Division on May 24, 2012 and Cherokee commenced operation of the demonstration project on June 15, 2012. If a mechanism was in place that allowed the Division to immediately authorize the implementation of Cherokee's methanol feed in early July 2011, the TIN limitation exceedences that occurred from July 2011 through June 2012 might have been avoided.

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21. The Division finds that Cherokee's position statement, including the additional statements documented in CMD's January 17, 2014 letter to the Division, are not entirely consistent with the information gathered in the course of the Division's inspections and investigation of the incidents described herein and the inclusion of Cherokee's position statement in this order should not be construed to constitute any admission or agreement by the Division as to the content of the position statement.

ORDER AND AGREEMENT

22. Based on the foregoing factual and legal determinations, pursuant to its authority under §§25-8-602 and 605, C.R.S., and in satisfaction of the alleged violations cited herein, the Division orders Cherokee to comply with all provisions of this Consent Order, including all requirements set forth below.

23. Cherokee agrees to the terms and conditions of this Consent Order. Cherokee agrees that this Consent Order constitutes a notice of alleged violation and an order issued pursuant to §§25-8-602 and 605, C.R.S., and is an enforceable requirement of the Act. Cherokee also agrees not to challenge directly or collaterally, in any judicial or administrative proceeding brought by the Division or by Cherokee against the Division:

    a. The issuance of this Consent Order;
    b. The factual and legal determinations made by the Division herein; and
    c. The Division's authority to bring, or the court's jurisdiction to hear, any action to enforce the terms of this Consent Order under the Act.

24. Notwithstanding the above, Cherokee does not admit to any of the factual or legal determinations made by the Division herein, and any action undertaken by Cherokee pursuant to this Consent Order shall not constitute evidence of fault and liability by Cherokee with respect to the conditions of the Facility.

Compliance Actions and Requirements

25. Cherokee shall immediately implement measures to attain compliance with the Colorado Water Quality Control Act and the terms and conditions of the Permit.

Schedule to Meet Total Inorganic Nitrogen Effluent Limit

26. Cherokee implemented a *Pilot/Full Scale Demonstration Project-Methanol Addition as a Carbon Source* ("Demonstration Project"), as initially authorized by the Division on May 24, 2012 with a subsequent authorization for an extension to December 31, 2013. The full-scale Demonstration Project was intended to provide for the addition of supplemental carbon to improve the denitrification process, modify the manner in which air delivery to the pre-react basin is accomplished to enhance anoxic conditions and provide for internal recycle in the aeration basin to the pre-react zone. Cherokee submitted a request to the Division to continue the Demonstration Project past December 31, 2013 to September 30, 2014. On November 26, 2013, the Division extended authorization to operate the Demonstration Project to May 24, 2014, which is two years after the initial authorization to operate the Demonstration Project.

27. On July 17, 2013, Cherokee submitted an Application for Amendment of an Existing Site Location Approval to incorporate modifications to the activated sludge system to enhance and improve performance of the denitrification process. The Division approved the Application for Amendment on September 27, 2013. The Amendment authorized Cherokee to proceed with implementation of permanent improvements for application of methanol as a supplemental carbon source to enhance the denitrification process at the Facility.

28. In accordance with the Division's WPC Policy DR-1, Cherokee submitted a Process Design Report ("PDR") to the Division on November 26, 2013, addressing the permanent improvements to the Facility to facilitate the addition of methanol as a supplemental carbon source. By April 30, 2014, Cherokee shall submit a certification of the design and construction documents (plans and specifications) in accordance with the "streamlined design review process" specified by Water Quality Control Commission ("WQCC") Regulation No. 22.

29. Upon receipt and acceptance of the certification of design and construction documents submitted by Cherokee for the Facility improvements to add supplemental carbon referenced in Paragraph 28, the Division will provide Cherokee authorization to continue the Demonstration Project until August 31, 2014 during which time Cherokee will implement the permanent improvements to the Facility.

30. Within sixty (60) days of the Division's approval of the PDR and the plans and specifications for the new preliminary treatment facility, Cherokee shall initiate construction of the new preliminary treatment facility. Cherokee shall submit quarterly progress reports to the Division outlining the progress of the preliminary treatment facility construction. At a minimum, each report shall outline activities undertaken in the current reporting period and planned activities for the next three (3) months to remain in compliance with this Consent Order.

Schedule to Meet Total Dissolved Solids Effluent Limit

31. Within thirty (30) days of the effective date of this Consent Order, Cherokee shall commence a technical assessment of the suitability and effectiveness of accomplishing Total Dissolved Solids ("TDS") removal in its source water supply as a means of controlling TDS discharge from the Facility. This will include blending with new source water supplies presently being developed and source water treatment. The assessment of alternative approaches for TDS control will also include evaluation of TDS control at the Facility's biological process discharge. Additionally, Cherokee shall prepare a summary report of the findings of the assessment of the suitability and effectiveness of accomplishing TDS removal in its source water supply and submit this report to the Division.

32. Within one hundred eighty (180) days of the effective date of this Consent Order, Cherokee shall complete the assessment of technically feasible approaches to control TDS in the Facility's effluent, as required by Paragraph 31 of this Consent Order addressing financial and cost-benefit impacts, operational impacts with particular attention to the requirements for management of residuals from the TDS control processes, legal issues and impacts from conditions of well permits, decrees and other water resource management and use agreements, water use efficiency, institutional constraints and other identified issues which will influence the selection of a TDS control strategy for implementation. Additionally, Cherokee shall prepare a summary report of the findings of the assessment described in this paragraph and submit to the Division.

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33. Within two hundred ten (210) calendar days of the effective date of this Consent Order, Cherokee shall submit to the Division an implementation plan for a selected TDS control strategy, as addressed in Paragraphs 31 and 32. The submitted plan shall become a condition of this Consent Order and Cherokee shall comply with the plan as submitted unless notified by the Division, in writing within sixty (60) calendar days of the submittal, that modifications or an alternate plan or program is appropriate. If the Division imposes modifications or an alternate plan or program, it shall also become a condition of this Consent Order.

34. Within sixty (60) days of the effective date of this Consent Order, Cherokee shall submit a summary report of the review and an update of the dynamic groundwater model of the Black Squirrel Creek alluvial aquifer in the vicinity of the rapid infiltration basins to which the Facility discharges. Cherokee shall analyze the variation in the groundwater phreatic surface as a result of application of treated wastewater in the rapid infiltration basins and pumping of production wells upstream and downstream, and laterally from the rapid infiltration basins.

35. Within thirty (30) days of the effective date of this Consent Order, Cherokee shall complete development of a customer education program expressed as Best Management Practices to maximize the efficiency of home water softeners for purposes of minimizing wastewater generated from the ion exchange resin regeneration process. The primary means of education will be through Cherokee's customer newsletter. Outreach and educational tools shall also be developed for implementation of Best Management Practices for TDS control in nonresidential wastewater contributions. Cherokee shall publish the consumer education program in the customer newsletter no less than semi-annually.

36. Within forty-five (45) days of the effective date of this Consent Order, Cherokee shall develop design and construction documents for new groundwater monitoring wells at or near Cherokee's property boundary and submit to the Division for approval. Within one hundred twenty (120) days following Division approval of the new groundwater monitoring well location's design and construction documents, Cherokee shall complete construction of the modified groundwater monitoring system.

37. Within one hundred eighty (180) days of the effective date of this Consent Order, Cherokee shall complete an assessment of the local limits in its pretreatment program addressing TDS and other constituents of concern in accordance with USEPA Region 8 guidance for development of local limits. Additionally, within two hundred ten (210) days of the effective date of this Consent Order, Cherokee shall prepare a summary report of the findings of the assessment and submit to the Division.

38. All documents submitted under this Consent Order shall use the same titles as stated in this Consent Order, and shall reference both the number of this Consent Order and the number of the paragraph pursuant to which the document is required. No plan submitted for Division approval under this Consent Order may be implemented unless and until written approval is received from the Division except as otherwise specified or provided herein. Any approval by the Division of a plan submitted under this Consent Order is effective upon receipt by Cherokee. All approved plans, including all procedures and schedules contained in the plans, are hereby incorporated into this Consent Order, and shall constitute enforceable requirements under the Act.

CIVIL PENALTY AND SUPPLEMENTAL ENVIRONMENTAL PROJECTS

39. Based upon the application of the Division's Civil Penalty Policy (May 1, 1993), and consistent with Departmental policies for violations of the Act, the Division has determined that a penalty of Sixty Three Thousand Seven Hundred Twenty Dollars ($63,720.00) is appropriate for the violations cited herein.

40. Through the application of the criteria set forth in the Colorado Department of Public Health and Environment's Final Agency-Wide Policy on Settling Administrative and/or Civil Penalties Against Eligible Governmental Entities, the Division has determined the entire penalty can be mitigated through the completion of the following Supplemental Environmental Projects ("SEPs") identified by Cherokee and which are valued at Sixty Nine Thousand Seven Hundred Seventy Five Dollars ($69,775.00).

41. Cherokee shall undertake the following SEPs, which the Parties agree are intended to secure significant environmental or public health protection and improvements.

42. Cherokee shall spend no less than Sixty Nine Thousand Seven Hundred Seventy Five Dollars ($69,775.00) on the implementation and completion of energy efficiency/pollution prevention upgrades within the Cherokee service area in El Paso County. The combination of the first and third party SEPs are further described in Exhibit B. If Cherokee completes the energy efficiency/pollution prevention upgrades specified in Exhibit B and does not expend the full Sixty Nine Thousand Seven Hundred Seventy Five Dollars ($69,775.00), Cherokee may propose an alternate SEP for Division review and approval that accounts for the remaining balance. The alternate SEP proposal shall be submitted to the Division by December 1, 2014.

43. Cherokee shall not deduct the expenses associated with the implementation of the above-described SEPs for any tax purpose or otherwise obtain any favorable tax treatment of such payment or project.

44. Cherokee hereby certifies that, as of the date of this Consent Order, it is not under any existing legal obligation to perform or develop the SEPs. Cherokee further certifies that it has not received, and will not receive, credit in any other enforcement action for the SEPs. In the event that Cherokee has, or will receive credit under any other legal obligation for the SEPs, Cherokee shall pay Sixty Three Thousand Seven Hundred Twenty Dollars ($63,720.00) to the Division as a civil penalty within thirty (30) calendar days of receipt of a demand for payment by the Division. Method of payment shall be by certified or cashier's check drawn to the order of the "Colorado Department of Public Health and Environment," and delivered to:

    Michael Harris
    Colorado Department of Public Health and Environment
    Water Quality Control Division
    Mail Code: WQCD-CWE-B2
    4300 Cherry Creek Drive South
    Denver, Colorado 80246-1530

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45. The SEPs must be completed to the satisfaction of the Division by November 30, 2014, and must be operated for the useful life of the SEPs. In the event that Cherokee fails to comply with any of the terms or provisions of this Consent Order relating to the performance of the SEPs, Cherokee shall be liable for penalties as follows:

    a. Payment of a penalty in the amount of Sixty Three Thousand Seven Hundred Twenty Dollars ($63,720.00). The Division, in its sole discretion, may elect to reduce this penalty for environmental benefits created by the partial performance of the SEPs.

    b. Cherokee shall pay this penalty within thirty (30) calendar days of receipt of written demand by the Division. Method of payment shall be as specified in paragraph 44 above.

46. Cherokee shall submit SEP Completion Reports for each SEP to the Division by December 30, 2014. The SEP Completion Reports shall contain the following information:

    a. A detailed description of the SEPs as implemented;
    b. A description of any operating problems encountered and the solutions thereto;
    c. Itemized costs, documented by copies of purchase orders and receipts or canceled checks or other forms of proof of payment;
    d. Certification that the SEPs have been fully implemented pursuant to the provisions of this Consent Order; and
    e. A description of the environmental and public health benefits resulting from implementation of the SEPs (with quantification of the benefits and pollutant reductions, if feasible).

47. Failure to submit the SEP Completion Reports with the required information, or any periodic report, shall be deemed a violation of this Consent Order.

48. Cherokee shall include the following language in any public statement, oral or written, making reference to the SEPs: "This project was undertaken in connection with the settlement of an enforcement action taken by the Colorado Department of Public Health and Environment for alleged violations of the Colorado Water Quality Control Act."

SCOPE AND EFFECT OF CONSENT ORDER

49. The Parties agree and acknowledge that this Consent Order constitutes a full and final settlement of the alleged violations cited herein.

50. This Consent Order is subject to the Division's "Public Notification of Administrative Enforcement Actions Policy," which includes a thirty-day public comment period. The Division and Cherokee each reserve the right to withdraw consent to this Consent Order if comments received during the thirty-day period result in any proposed modification to the Consent Order.

51. This Consent Order constitutes a final agency action upon a determination by the Division following the public comment period. Any violation of the provisions of this Consent Order by Cherokee, including any false certifications, shall be a violation of a final order or action of the Division for the

purpose of §25-8-608, C.R.S., and may result in the assessment of civil penalties of up to ten thousand dollars per day for each day during which such violation occurs.

52. The Parties' obligations under this Consent Order are limited to the matters expressly stated herein or in approved submissions required hereunder. All submissions made pursuant to this Consent Order are incorporated into this Consent Order and become enforceable under the terms of this Consent Order as of the date of approval by the Division.

53. The Division's approval of any submission, standard, or action under this Consent Order shall not constitute a defense to, or an excuse for, any prior violation of the Act, or any subsequent violation of any requirement of this Consent Order or the Act.

54. Notwithstanding paragraph 24 above, the alleged violations described in this Consent Order will constitute part of Cherokee's compliance history for purposes where such history is relevant. This includes considering the alleged violations described above in assessing a penalty for any subsequent violations against Cherokee. Cherokee agrees not to challenge the use of the cited alleged violations for any such purpose.

55. This Consent Order does not relieve Cherokee from complying with all applicable Federal, State, and/or local laws in fulfillment of its obligations hereunder and shall obtain all necessary approvals and/or permits to conduct the activities required by this Consent Order. The Division makes no representation with respect to approvals and/or permits required by Federal, State, or local laws other than those specifically referred to herein.

LIMITATIONS, RELEASES AND RESERVATION OF RIGHTS AND LIABILITY

56. Upon the effective date of this Consent Order, and during its term, this Consent Order shall stand in lieu of any other enforcement action by the Division with respect to the specific instances of alleged violations cited herein. The Division reserves the right to bring any action to enforce this Consent Order, including actions for penalties or the collection thereof, and/or injunctive relief.

57. This Consent Order does not grant any release of liability for any violations not specifically cited herein.

58. Nothing in this Consent Order shall preclude the Division from imposing additional requirements in the event that new information is discovered that indicates such requirements are necessary to protect human health or the environment.

59. Upon the effective date of this Consent Order, Cherokee releases and covenants not to sue the State of Colorado or its employees, agents or representatives as to all common law or statutory claims or counterclaims arising from, or relating to, the alleged violations of the Act specifically addressed herein.

60. Cherokee shall not seek to hold the State of Colorado or its employees, agents or representatives liable for any injuries or damages to persons or property resulting from acts or omissions of Cherokee, or those acting for or on behalf of Cherokee, including its officers, employees, agents, successors, representatives, contractors, consultants or attorneys in carrying out activities pursuant to

this Consent Order. Cherokee shall not hold out the State of Colorado or its employees, agents or representatives as a party to any contract entered into by Cherokee in carrying out activities pursuant to this Consent Order. Nothing in this Consent Order shall constitute an express or implied waiver of immunity otherwise applicable to the State of Colorado, its employees, agents or representatives.

OFFSITE ACCESS

61. To the extent any plan submitted by Cherokee requires access to property not owned or controlled by Cherokee, Cherokee shall use its best efforts to obtain site access from the present owners of such property to conduct required activities and to allow Division access to such property to oversee such activities. In the event that site access is not obtained when necessary, Cherokee shall notify the Division in writing regarding its best efforts and its failure to obtain such access.

SITE ACCESS AND SAMPLING

62. The Division shall be authorized to oversee any and all work being performed under this Consent Order. The Division shall be authorized access to the Facility property at any time work is being conducted pursuant to this Consent Order, and during reasonable business hours during any period work is not being conducted, for the purposes of determining Cherokee's compliance with the Act, the Regulations, and this Consent Order. The Division shall be authorized to inspect work sites, operating and field logs, contracts, purchasing/shipping records, and other relevant records and documents relating to this Consent Order or any requirement under this Consent Order and to interview Cherokee personnel and contractors performing work required by this Consent Order. Nothing in this paragraph limits or impairs the Division's statutory authorities to enter and inspect the Facility.

63. The Division may conduct any tests necessary to ensure compliance with this Consent Order and to verify the data submitted by Cherokee. Cherokee shall notify the Division in writing of any sampling activities undertaken pursuant to any plan or requirement of this Consent Order a minimum of seventy-two (72) hours prior to the sampling being conducted, and shall provide split samples to the Division upon request.

64. Cherokee shall notify the Division in writing of any excavation, construction (including the construction of monitoring wells) or other investigatory or remedial activities undertaken pursuant to any plan or requirement of this Consent Order a minimum of seventy-two (72) hours prior to beginning the excavation, construction, or required activity. Cherokee shall provide the Division any blue print, diagram, construction or other permits for any construction activity undertaken pursuant to this Consent Order upon request.

FORCE MAJEURE

65. Cherokee shall perform the requirements of this Consent Order within the schedules and time limits set forth herein and in any approved plan unless the performance is prevented or delayed by events that constitute a force majeure. A force majeure is defined as any event arising from causes which are not reasonably foreseeable, which are beyond the control of Cherokee, and which cannot be overcome by due diligence.

66. Within seventy-two (72) hours of the time that Cherokee knows or has reason to know of the occurrence of any event which Cherokee has reason to believe may prevent Cherokee from timely compliance with any requirement under this Consent Order; Cherokee shall provide verbal notification to the Division. Within seven (7) calendar days of the time that Cherokee knows or has reason to know of the occurrence of such event, Cherokee shall submit to the Division a written description of the event causing the delay, the reasons for and the expected duration of the delay, and actions which will be taken to mitigate the duration of the delay.

67. The burden of proving that any delay was caused by a force majeure shall at all times rest with Cherokee. If the Division agrees that a force majeure has occurred, the Division will so notify Cherokee. The Division will also approve or disapprove of Cherokee's proposed actions for mitigating the delay. If the Division does not agree that a force majeure has occurred, or if the Division disapproves of Cherokee's proposed actions for mitigating the delay, it shall provide a written explanation of its determination to Cherokee. Pursuant to the Dispute Resolution section, within fifteen (15) calendar days of receipt of the explanation, Cherokee may file an objection.

68. Delay in the achievement of one requirement shall not necessarily justify or excuse delay in the achievement of subsequent requirements. In the event any performance under this Consent Order is found to have been delayed by a force majeure, Cherokee shall perform the requirements of this Consent Order that were delayed by the force majeure with all due diligence.

DISPUTE RESOLUTION

69. If the Division determines that that a violation of this Consent Order has occurred, that a force majeure has not occurred; that the actions taken by Cherokee to mitigate the delay caused by a force majeure are inadequate; that Cherokee's Notice of Completion should be rejected pursuant to paragraph 75, or that the Cherokee's SEP Completion Report submitted pursuant to paragraph 46 is deficient, the Division shall provide a written explanation of its determination to Cherokee. Within fifteen (15) calendar days of receipt of the Division's determination, Cherokee shall:

    a. Submit a notice of acceptance of the determination; or
    b. Submit a notice of dispute of the determination.

    If Cherokee fails to submit either of the above notices within the specified time, it will be deemed to have accepted the Division's determination.

70. If the Division disapproves or approves with modifications any original or revised plan submitted by Cherokee pursuant to this Consent Order, the Division shall provide a written explanation of the disapproval or approval with modifications. Within fifteen (15) calendar days of receipt of the Division's approval with modifications or disapproval of the plan, Cherokee shall:

    a. In the case of an approval with modifications only, submit a notice of acceptance of the plan as modified and begin to implement the modified plan;

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b. In the case of disapproval only, submit a revised plan for Division review and approval. Cherokee may not select this option if the Division has included in its disapproval an alternate plan that shall be implemented by Cherokee; or

c. Submit a notice of dispute of the disapproval or approval with modifications.

If Cherokee fails to do any of the above within the specified time, Cherokee shall be deemed to have failed to comply with the Consent Order, and the Division may bring an enforcement action, including an assessment of penalties.

71. If Cherokee submits a revised plan, the plan shall respond adequately to each of the issues raised in the Division's written explanation of the disapproval or approval with modifications. The Division may determine that failure to respond adequately to each of the issues raised in the Division's written explanation constitutes a violation of this Consent Order. The Division shall notify Cherokee in writing of its approval, approval with modifications, or disapproval of the revised plan. If the Division disapproves the revised plan, it may include in its disapproval a plan for implementation by Cherokee. Such disapproval and plan shall be deemed effective and subject to appeal in accordance with the Act and the Colorado State Administrative Procedures Act, §§ 24-4-101 through 108, C.R.S. (the "APA"), unless Cherokee submits a notice of dispute, pursuant to paragraph 70 above, of the Division's disapproval and plan for implementation. All requirements and schedules of the Division's plan shall not become effective pending resolution of the dispute.

NOTICES

72. Unless otherwise specified, any report, notice or other communication required under the Consent Order shall be sent to:

For the Division:

Colorado Department of Public Health and Environment
Water Quality Control Division / WQCD-CWE-B2
Attention: Michael Harris
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530
Telephone: 303.692.3598
E-mail: michael.harris@state.co.us

For Cherokee Metropolitan District:

Cherokee Metropolitan District
Attention: Sean Chambers, General Manager
6250 Palmer Park Boulevard
Colorado Springs, Colorado 80915
Telephone: 719.597.5080
E-mail: schambers@cherokeemetro.org

OBLIGATIONS UNAFFECTED BY BANKRUPTCY

73. The obligations set forth herein are based on the Division's police and regulatory authority. These obligations require specific performance by Cherokee of corrective actions carefully designed to prevent on-going or future harm to public health or the environment, or both. Enforcement of these obligations is not stayed by a petition in bankruptcy. Cherokee agrees that the penalties set forth in this Consent Order are not in compensation of actual pecuniary loss. Further, the obligations imposed by this Consent Order are necessary for Cherokee and the Facility to achieve and maintain compliance with State law.

MODIFICATIONS

74. This Consent Order may be modified only upon mutual written agreement of the Parties.

COMPLETION OF REQUIRED ACTIONS

75. Cherokee shall submit a Notice of Completion to the Division upon satisfactory completion of all requirements of this Consent Order. The Division shall either accept or reject Cherokee's Notice of Completion in writing within thirty (30) calendar days of receipt. If the Division rejects Cherokee's Notice of Completion, it shall include in its notice a statement identifying the requirements that the Division considers incomplete or not satisfactorily performed and a schedule for completion. Cherokee shall, within fifteen (15) calendar days of receipt of the Division's rejection, either:

    a. Submit a notice of acceptance of the determination; or
    b. Submit a notice of dispute.

    If Cherokee fails to submit either of the above notices within the specified time, it will be deemed to have accepted the Division's determination.

NOTICE OF EFFECTIVE DATE

76. This Consent Order shall be fully effective, enforceable and constitute a final agency action upon notice from the Division following closure of the public comment period referenced in paragraph 50.

BINDING EFFECT AND AUTHORIZATION TO SIGN

77. This Consent Order is binding upon Cherokee and its officials, employees, agents, representatives, successors in interest, and assigns. The undersigned warrant that they are authorized to legally bind their respective principals to this Consent Order. Cherokee agrees to provide a copy of this Consent Order to any contractors and other agents performing work pursuant to this Consent Order and require such agents to comply with the requirements of this Consent Order. In the event that a party does not sign this Consent Order within thirty (30) calendar days of the other party's signature, this

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Consent Order becomes null and void. This Consent Order may be executed in multiple counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same Consent Order.

FOR CHEROKEE METROPOLITAN DISTRICT:

Date: May 9, 2014

Sean Chambers, General Manager

FOR THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT:

Date: 5/14/14

Steven H. Gunderson, Director
WATER QUALITY CONTROL DIVISION

Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name:Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12:00:00 AM
Monitoring Period End Date To: 4/21/2014 12:00:00 AM
Outfalls: (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to: (Optional)

Permit #	COX048348
Facility Name	CHEROKEE METRO DISTRICT WATER RECLAMATION FACILITY
Permit Name	Cherokee Metro District

Permit Status	Major/Minor Ind.	County	Primary SIC Code	Water Body:	Groundwater
Effective	Major	El Paso	4952		

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	001A	7/1/10	7/31/10	00310 - BOD, 5-day, 20 deg. C	=47	mg/L	30	30DA AVG	57	E90			
COX048348	001A	7/1/10	7/31/10	00310 - BOD, 5-day, 20 deg. C	=47	mg/L	45	MX 7D AV	4	E90			
COX048348	001A	7/1/10	7/31/10	00640 - Nitrogen, inorganic total	=28.1	mg/L	10	DAILY MX	181	E90		R	2
COX048348	001A	7/1/10	7/31/10	81010 - BOD, 5-day, percent removal	=65.4	%	85	MO AV MN	131	E90			
COX048348	001A	7/1/10	7/31/10	81011 - Solids, suspended percent removal	=68.8	%	85	MO AV MN	108	E90			
COX048348	001A	8/1/10	8/31/10	00640 - Nitrogen, inorganic total	=33.8	mg/L	10	DAILY MX	238	E90		R	2
COX048348	001A	8/1/10	8/31/10	81010 - BOD, 5-day, percent removal	=76	%	85	MO AV MN	60	E90			
COX048348	001A	9/1/10	9/30/10	00640 - Nitrogen, inorganic total	=17.41	mg/L	10	DAILY MX	74	E90		R	2
COX048348	001A	9/1/10	9/30/10	81010 - BOD, 5-day, percent removal	=80	%	85	MO AV MN	33	E90			
COX048348	001A	10/1/10	10/31/10	00640 - Nitrogen, inorganic total	=12.64	mg/L	10	DAILY MX	26	E90		U	2
COX048348	001A	10/1/10	10/31/10	81010 - BOD, 5-day, percent removal	=80	%	85	MO AV MN	33	E90			
COX048348	001A	10/1/10	10/31/10	81011 - Solids, suspended percent removal	=83	%	85	MO AV MN	13	E90			
COX048348	001A	11/1/10	11/30/10	00310 - BOD, 5-day, 20 deg. C	=36.5	mg/L	30	30DA AVG	22	E90			

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Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name.Effluent Data ***

Monitoring Period End Date From 5/1/2010 12:00.00 AM
Monitoring Period End Date To. 4/21/2014 12 00:00 AM
Outfalls (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc (Optional)
Enter Primary Permit SIC Code Not Equal to: (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	001A	11/1/10	11/30/10	00640 - Nitrogen, inorganic total	=10.5	mg/L	10	DAILY MX	5	E90		U	2
COX048348	001A	2/1/11	2/28/11	00310 - BOD, 5-day, 20 deg. C	=34	mg/L	30	30DA AVG	13	E90			
(048348	001A	2/1/11	2/28/11	00640 - Nitrogen, inorganic total	=21.53	mg/L	10	DAILY MX	115	E90		R	2
COX048348	001A	2/1/11	2/28/11	81010 - BOD, 5-day, percent removal	=84	%	85	MO AV MN	7	E90			
COX048348	001A	3/1/11	3/31/11	00310 - BOD, 5-day, 20 deg. C	=69	mg/L	30	30DA AVG	130	E90			
COX048348	001A	3/1/11	3/31/11	00310 - BOD, 5-day, 20 deg. C	=69	mg/L	45	MX 7D AV	53	E90			
COX048348	001A	3/1/11	3/31/11	00530 - Solids, total suspended	=32	mg/L	30	30DA AVG	7	E90			
COX048348	001A	3/1/11	3/31/11	00640 - Nitrogen, inorganic total	=34.02	mg/L	10	DAILY MX	240	E90		R	2
COX048348	001A	3/1/11	3/31/11	81010 - BOD, 5-day, percent removal	=84	%	85	MO AV MN	7	E90			
COX048348	001A	4/1/11	4/30/11	00640 - Nitrogen, inorganic total	=21.3	mg/L	10	DAILY MX	113	E90		R	2
COX048348	001A	5/1/11	5/31/11	00640 - Nitrogen, inorganic total	=12.2	mg/L	10	DAILY MX	22	E90		U	2
(048348	001A	6/1/11	6/30/11	00640 - Nitrogen, inorganic total	=11.8	mg/L	10	DAILY MX	18	E90		U	2
COX048348	001A	7/1/11	7/31/11	00640 - Nitrogen, inorganic total	=18.8	mg/L	10	DAILY MX	88	E90		R	2
COX048348	001A	8/1/11	8/31/11	00640 - Nitrogen, inorganic total	=20.9	mg/L	10	DAILY MX	109	E90		R	2
COX048348	001A	9/1/11	9/30/11	00640 - Nitrogen, inorganic total	=20	mg/L	10	DAILY MX	100	E90		R	2
COX048348	001A	10/1/11	10/31/11	00640 - Nitrogen, inorganic total	=20.9	mg/L	10	DAILY MX	109	E90		R	2
COX048348	001A	1/1/12	1/31/12	00640 - Nitrogen, inorganic total	=19	mg/L	10	DAILY MX	90	E90		R	2
COX048348	001A	2/1/12	2/29/12	00640 - Nitrogen, inorganic total	=12.99	mg/L	10	DAILY MX	30	E90		H	2

Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name:Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12:00:00 AM
Monitoring Period End Date To: 4/21/2014 12:00:00 AM
Outfalls: (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to: (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	001A	3/1/12	3/31/12	00640 - Nitrogen, inorganic total	=11.42	mg/L	10	DAILY MX	14	E90		H	2
COX048348	001A	4/1/12	4/30/12	00640 - Nitrogen, inorganic total	=16.48	mg/L	10	DAILY MX	65	E90		R	2
COX048348	001A	5/1/12	5/31/12	00640 - Nitrogen, inorganic total	=11.8	mg/L	10	DAILY MX	18	E90		H	2
COX048348	001A	7/1/12	7/31/12	00640 - Nitrogen, inorganic total	=13.4	mg/L	10	DAILY MX	34	E90		U	2
COX048348	001A	8/1/12	8/31/12	00640 - Nitrogen, inorganic total	=12.5	mg/L	10	DAILY MX	25	E90		U	2
COX048348	001A	10/1/12	10/31/12	00640 - Nitrogen, inorganic total	=20	mg/L	10	DAILY MX	100	E90		R	2
COX048348	001A	11/1/12	11/30/12	00640 - Nitrogen, inorganic total	=18	mg/L	10	DAILY MX	80	E90		R	2
COX048348	001A	12/1/12	12/31/12	00640 - Nitrogen, inorganic total	=13	mg/L	10	DAILY MX	30	E90		U	2
COX048348	001A	1/1/13	1/31/13	00640 - Nitrogen, inorganic total	=22	mg/L	10	DAILY MX	120	E90		R	2
COX048348	001A	2/1/13	2/28/13	00640 - Nitrogen, inorganic total	=23	mg/L	10	DAILY MX	130	E90		R	2
COX048348	001A	3/1/13	3/31/13	00640 - Nitrogen, inorganic total	=17	mg/L	10	DAILY MX	70	E90		R	2
COX048348	050CC	7/1/10	7/31/10	70295 - Solids, total dissolved	=2000	mg/L	400	30DA AVG	400	E90		T	1
COX048348	050CC	10/1/10	10/31/10	70295 - Solids, total dissolved	=762	mg/L	400	30DA AVG	91	E90		T	1
COX048348	050CC	11/1/10	11/30/10	70295 - Solids, total dissolved	=752	mg/L	400	30DA AVG	88	E90		T	1
COX048348	050CC	12/1/10	12/31/10	70295 - Solids, total dissolved	=680	mg/L	400	30DA AVG	70	E90		T	1
COX048348	050CC	1/1/11	1/31/11	70295 - Solids, total dissolved	=624	mg/L	400	30DA AVG	56	E90		T	1
COX048348	050CC	2/1/11	2/28/11	70295 - Solids, total dissolved	=642	mg/L	400	30DA AVG	61	E90		T	1
COX048348	050CC	3/1/11	3/31/11	70295 - Solids, total dissolved	=694	mg/L	400	30DA AVG	74	E90		T	1

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Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A
Colorado Department of Public Health and Environment
Water Quality Control Division
Effluent Violation Report

Date of Report: 4/21/14

*** Query Name.Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12.00.00 AM
Monitoring Period End Date To: 4/21/2014 12.00:00 AM
Outfalls (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	050CC	4/1/11	4/30/11	70295 - Solids, total dissolved	=664	mg/L	400	30DA AVG	66	E90		T	1
COX048348	050CC	5/1/11	5/31/11	70295 - Solids, total dissolved	=653	mg/L	400	30DA AVG	63	E90		T	1
:048348	050CC	6/1/11	6/30/11	70295 - Solids, total dissolved	=666	mg/L	400	30DA AVG	67	E90		T	1
COX048348	050CC	7/1/11	7/31/11	70295 - Solids, total dissolved	=704	mg/L	400	30DA AVG	76	E90		T	1
COX048348	050CC	8/1/11	8/31/11	70295 - Solids, total dissolved	=637	mg/L	400	30DA AVG	59	E90		T	1
COX048348	050CC	9/1/11	9/30/11	70295 - Solids, total dissolved	=658	mg/L	400	30DA AVG	65	E90		T	1
COX048348	050CC	10/1/11	10/31/11	70295 - Solids, total dissolved	=600	mg/L	400	30DA AVG	50	E90		T	1
COX048348	050CC	11/1/11	11/30/11	70295 - Solids, total dissolved	=645	mg/L	400	30DA AVG	61	E90		T	1
COX048348	050CC	12/1/11	12/31/11	70295 - Solids, total dissolved	=678	mg/L	400	30DA AVG	70	E90		T	1
COX048348	050CC	1/1/12	1/31/12	70295 - Solids, total dissolved	=654	mg/L	400	30DA AVG	64	E90		T	1
COX048348	050CC	2/1/12	2/29/12	70295 - Solids, total dissolved	=671	mg/L	400	30DA AVG	68	E90		T	1
:048348	050CC	3/1/12	3/31/12	70295 - Solids, total dissolved	=682	mg/L	400	30DA AVG	71	E90		T	1
COX048348	050CC	4/1/12	4/30/12	70295 - Solids, total dissolved	=669	mg/L	400	30DA AVG	67	E90		T	1
COX048348	050CC	5/1/12	5/31/12	70295 - Solids, total dissolved	=732	mg/L	400	30DA AVG	83	E90		T	1
COX048348	050CC	6/1/12	6/30/12	70295 - Solids, total dissolved	=656	mg/L	400	30DA AVG	64	E90		T	1
COX048348	050CC	7/1/12	7/31/12	70295 - Solids, total dissolved	=667	mg/L	400	30DA AVG	67	E90		T	1
COX048348	050CC	8/1/12	8/31/12	70295 - Solids, total dissolved	=672	mg/L	400	30DA AVG	68	E90		T	1
COX048348	050CC	9/1/12	9/30/12	70295 - Solids, total dissolved	=654	mg/L	400	30DA AVG	64	E90		T	1

Report #: CAEVRBX004

Created Date: March 2, 2012

Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name:Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12:00:00 AM
Monitoring Period End Date To: 4/21/2014 12:00:00 AM
Outfalls: (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to: (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	050CC	10/1/12	10/31/12	70295 - Solids, total dissolved	=617	mg/L	400	30DA AVG	54	E90		T	1
COX048348	050CC	11/1/12	11/30/12	70295 - Solids, total dissolved	=605	mg/L	400	30DA AVG	51	E90		T	1
COX048348	050CC	12/1/12	12/31/12	70295 - Solids, total dissolved	=610	mg/L	400	30DA AVG	53	E90		T	1
COX048348	050CC	1/1/13	1/31/13	70295 - Solids, total dissolved	=610	mg/L	400	30DA AVG	53	E90		T	1
COX048348	050CC	2/1/13	2/28/13	70295 - Solids, total dissolved	=606	mg/L	400	30DA AVG	52	E90		T	1
COX048348	050CC	3/1/13	3/31/13	70295 - Solids, total dissolved	=638	mg/L	400	30DA AVG	60	E90		T	1
COX048348	050CC	4/1/13	4/30/13	70295 - Solids, total dissolved	=573	mg/L	400	30DA AVG	43	E90		T	1
COX048348	050CC	5/1/13	5/31/13	70295 - Solids, total dissolved	=643	mg/L	400	30DA AVG	61	E90		T	1
COX048348	050CC	6/1/13	6/30/13	70295 - Solids, total dissolved	=567	mg/L	400	30DA AVG	42	E90		T	1
COX048348	050CC	7/1/13	7/31/13	70295 - Solids, total dissolved	=605	mg/L	400	30DA AVG	51	E90		T	1
COX048348	050CC	8/1/13	8/31/13	70295 - Solids, total dissolved	=510	mg/L	400	30DA AVG	28	E90		C	1
COX048348	050CC	9/1/13	9/30/13	70295 - Solids, total dissolved	=422	mg/L	400	30DA AVG	6	E90		C	1
COX048348	050CC	10/1/13	10/31/13	70295 - Solids, total dissolved	=444	mg/L	400	30DA AVG	11	E90		C	1
COX048348	050CC	11/1/13	11/30/13	70295 - Solids, total dissolved	=504	mg/L	400	30DA AVG	26	E90		C	1
COX048348	050CC	12/1/13	12/31/13	70295 - Solids, total dissolved	=442	mg/L	400	30DA AVG	11	E90		C	1
COX048348	050CC	1/1/14	1/31/14	70295 - Solids, total dissolved	=476	mg/L	400	30DA AVG	19	E90			
COX048348	050CC	2/1/14	2/28/14	70295 - Solids, total dissolved	=496	mg/L	400	30DA AVG	24	E90			
COX048348	050DD	7/1/10	7/31/10	70295 - Solids, total dissolved	=2000	mg/L	400	30DA AVG	400	E90		T	1

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Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12 00:00 AM
Monitoring Period End Date To 4/21/2014 12 00 00 AM
Outfalls (Optional)
Enter NPDES ID (Optional)
Primary Permit SIC Code (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	050DD	10/1/10	10/31/10	70295 - Solids, total dissolved	=786	mg/L	400	30DA AVG	97	E90		T	1
COX048348	050DD	11/1/10	11/30/10	70295 - Solids, total dissolved	=618	mg/L	400	30DA AVG	55	E90		T	1
X048348	050DD	12/1/10	12/31/10	70295 - Solids, total dissolved	=672	mg/L	400	30DA AVG	68	E90		T	1
COX048348	050DD	1/1/11	1/31/11	70295 - Solids, total dissolved	=774	mg/L	400	30DA AVG	94	E90		T	1
COX048348	050DD	2/1/11	2/28/11	70295 - Solids, total dissolved	=638	mg/L	400	30DA AVG	60	E90		T	1
COX048348	050DD	3/1/11	3/31/11	70295 - Solids, total dissolved	=692	mg/L	400	30DA AVG	73	E90		T	1
COX048348	050DD	4/1/11	4/30/11	70295 - Solids, total dissolved	=674	mg/L	400	30DA AVG	69	E90		T	1
COX048348	050DD	5/1/11	5/31/11	70295 - Solids, total dissolved	=725	mg/L	400	30DA AVG	81	E90		T	1
COX048348	050DD	6/1/11	6/30/11	70295 - Solids, total dissolved	=702	mg/L	400	30DA AVG	76	E90		T	1
COX048348	050DD	7/1/11	7/31/11	70295 - Solids, total dissolved	=734	mg/L	400	30DA AVG	84	E90		T	1
COX048348	050DD	8/1/11	8/31/11	70295 - Solids, total dissolved	=670	mg/L	400	30DA AVG	68	E90		T	1
(048348	050DD	9/1/11	9/30/11	70295 - Solids, total dissolved	=684	mg/L	400	30DA AVG	71	E90		T	1
COX048348	050DD	10/1/11	10/31/11	70295 - Solids, total dissolved	=746	mg/L	400	30DA AVG	87	E90		T	1
COX048348	050DD	11/1/11	11/30/11	70295 - Solids, total dissolved	=707	mg/L	400	30DA AVG	77	E90		T	1
COX048348	050DD	12/1/11	12/31/11	70295 - Solids, total dissolved	=714	mg/L	400	30DA AVG	79	E90		T	1
COX048348	050DD	1/1/12	1/31/12	70295 - Solids, total dissolved	=692	mg/L	400	30DA AVG	73	E90		T	1
COX048348	050DD	2/1/12	2/29/12	70295 - Solids, total dissolved	=706	mg/L	400	30DA AVG	77	E90		T	1
COX048348	050DD	3/1/12	3/31/12	70295 - Solids, total dissolved	=682	mg/L	400	30DA AVG	71	E90		T	1

Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name:Effluent Data ***

Monitoring Period End Date From: 5/1/2010 12:00:00 AM
Monitoring Period End Date To: 4/21/2014 12:00:00 AM
Outfalls: (Optional)
Enter NPDES ID: (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to: (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	050DD	4/1/12	4/30/12	70295 - Solids, total dissolved	=656	mg/L	400	30DA AVG	64	E90		T	1
COX048348	050DD	5/1/12	5/31/12	70295 - Solids, total dissolved	=669	mg/L	400	30DA AVG	67	E90		T	1
COX048348	050DD	6/1/12	6/30/12	70295 - Solids, total dissolved	=630	mg/L	400	30DA AVG	58	E90		T	1
COX048348	050DD	7/1/12	7/31/12	70295 - Solids, total dissolved	=697	mg/L	400	30DA AVG	74	E90		T	1
COX048348	050DD	8/1/12	8/31/12	70295 - Solids, total dissolved	=605	mg/L	400	30DA AVG	51	E90		T	1
COX048348	050DD	9/1/12	9/30/12	70295 - Solids, total dissolved	=544	mg/L	400	30DA AVG	36	E90		V	1
COX048348	050DD	10/1/12	10/31/12	70295 - Solids, total dissolved	=689	mg/L	400	30DA AVG	72	E90		T	1
COX048348	050DD	11/1/12	11/30/12	70295 - Solids, total dissolved	=695	mg/L	400	30DA AVG	74	E90		T	1
COX048348	050DD	12/1/12	12/31/12	70295 - Solids, total dissolved	=706	mg/L	400	30DA AVG	77	E90		T	1
COX048348	050DD	1/1/13	1/31/13	70295 - Solids, total dissolved	=651	mg/L	400	30DA AVG	63	E90		T	1
COX048348	050DD	2/1/13	2/28/13	70295 - Solids, total dissolved	=580	mg/L	400	30DA AVG	45	E90		T	1
COX048348	050DD	3/1/13	3/31/13	70295 - Solids, total dissolved	=629	mg/L	400	30DA AVG	57	E90		T	1
COX048348	050DD	4/1/13	4/30/13	70295 - Solids, total dissolved	=608	mg/L	400	30DA AVG	52	E90		T	1
COX048348	050DD	5/1/13	5/31/13	70295 - Solids, total dissolved	=634	mg/L	400	30DA AVG	59	E90		T	1
COX048348	050DD	6/1/13	6/30/13	70295 - Solids, total dissolved	=595	mg/L	400	30DA AVG	49	E90		T	1
COX048348	050DD	7/1/13	7/31/13	70295 - Solids, total dissolved	=614	mg/L	400	30DA AVG	54	E90		T	1
COX048348	050DD	8/1/13	8/31/13	70295 - Solids, total dissolved	=641	mg/L	400	30DA AVG	60	E90		T	1
COX048348	050DD	9/1/13	9/30/13	70295 - Solids, total dissolved	=597	mg/L	400	30DA AVG	49	E90		T	1

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Report #: CAEVRBX004
Created Date: March 2, 2012
Approved By:

EXHIBIT A

Colorado Department of Public Health and Environment

Water Quality Control Division

Effluent Violation Report

Date of Report: 4/21/14

*** Query Name:Effluent Data ***

Monitoring Period End Date From. 5/1/2010 12:00:00 AM
Monitoring Period End Date To: 4/21/2014 12:00.00 AM
Outfalls: (Optional)
Enter NPDES ID. (Optional)
Primary Permit SIC Code: (Optional)
Major/Minor (Enter "Major" or "Minor") (Enter * to select all) *
Matching NPDES ID: (Optional)COX048348
Parameter Desc: (Optional)
Enter Primary Permit SIC Code Not Equal to (Optional)

NPDES ID	Outfall	Mon Pd Start Date	Mon Pd End Date	Parameter	Rpted Value	Unit Desc	Limit Value	Stat Base Desc	% Exceed	Viol Code	NODI Code	RNC Detect Code	RNC Resolve Code
COX048348	050DD	10/1/13	10/31/13	70295 - Solids, total dissolved	=572	mg/L	400	30DA AVG	43	E90		T	1
COX048348	050DD	11/1/13	11/30/13	70295 - Solids, total dissolved	=549	mg/L	400	30DA AVG	37	E90		V	1
X048348	050DD	12/1/13	12/31/13	70295 - Solids, total dissolved	=492	mg/L	400	30DA AVG	23	E90		V	1
COX048348	050DD	1/1/14	1/31/14	70295 - Solids, total dissolved	=515	mg/L	400	30DA AVG	29	E90			
COX048348	050DD	2/1/14	2/28/14	70295 - Solids, total dissolved	=496	mg/L	400	30DA AVG	24	E90			

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EXHIBIT B

SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEP) FIRST PARTY PROPOSAL/AGREEMENT FORM

The Regulated Entity, identified below, submits the following SEP application to the Colorado Department of Public Health and Environment (the Department) for consideration.

Enforcement Action Information	Cherokee Metropolitan District Case No.: ~~MC-14XXXX~~ MC-140514-1
Regulated Entity Project Manager	Sean Chambers, General Manager Cherokee Metropolitan District 6250 Palmer Park Boulevard Colorado Springs, CO 80915 Office Telephone: 719-597-5080 E-mail Address: SChambers@cherokeemetro.org
CDPHE Contact Person	Rachel Wilson-Roussel, Supplemental Environmental Projects Coordinator, 303-692-2976, rachel.wilson-roussel@state.co.us -and- Mike Harris, WQCD Compliance and Enforcement Unit Manager, 303-692-3598, michael.harris@state.co.us
Geographical Area to Benefit Most Directly From Project	Cherokee Metropolitan District Street Light Service Area located in unincorporated El Paso County, Colorado
Project Name	LED Exterior Lighting Project
Project Type	**First Party**
SEP Category	Pollution Prevention
Project Summary	The Cherokee Metropolitan District (CMD) LED Lighting Project will replace a portion of the existing exterior lighting fixtures serving CMD facilities which use metal halide (mercury vapor and high pressure sodium) lamp technology with light emitting diode (LED) lamp assemblies. The LED lamp assemblies will be applied to certain fixtures at the CMD office and maintenance building and at the clubhouse and maintenance facility of the Cherokee Ridge Golf Course that are energized during all non-daylight hours each day of the year.

EXHIBIT B

Project Description	As detailed in Attachment CMD-1, this project would replace 19 high pressure sodium (HPS) or mercury vapor pole and wall mounted lights with LED lamp assemblies with 18 LED lamps, using less than one half of the energy for an equivalent light output. The intent is to replace nine (9) existing pole mounted 400 watt lamp fixtures at public parking and exterior work areas at the District's facilities. Five pole mounted fixtures will be retrofitted at the CMD office and maintenance shop. Four pole mounted fixtures will be retrofitted at the public parking lot at the Cherokee Ridge Golf Course. Nine (9) 400 watt, eight (8) existing wall mounted fixtures (70 to 400 watts each) and two (2) 70 watt mercury vapor lamps (mast mounted) will be replaced with LED lamp assemblies that have a comparable light output. The 400 watt lamps would be replaced with an 85 watt LED assembly and the other wall and mast mounted fixtures would be replaced with one 30 or 50 watt LED assembly at each location. The two (2) 70 watt mercury vapor lamps at the Terminal Ave. Pump Station will be replaced with one (1) LED lamp assembly. The objective is to reduce energy consumption by over 50% which would reduce the carbon footprint relative to lights presently in use. Existing lamps have a design life of no more than 40,000 hours while LED lamps are anticipated to have a useful life of at least 100,000 hours. This increase in lamp life reduces the District's cost of service to its constituents for independent contractor service and expenditures for electric energy. Implementation would consist of design, procurement and installation. Fixture selection for this retrofit project will be those fixtures which are normally continuously energized during all non-daylight hours.
Expected Environmental and/or Public Health Benefits	Refer to Attachment CMD-1 for a tabulation of the lighting fixture locations, characteristics and expected environmental impacts and benefits. Summary: Annual Estimated Energy Savings = 21,500 kWh Annual Estimated Energy Cost Savings = $1,726 Annual Estimated Maintenance Cost Savings = $338 Discussion: This project would reduce energy consumption by over 21,500 kWh per year. This represents an annual reduction of 12.9 to 25.8 tons of CO_2 depending on generation mix. All of the lamps proposed for retrofitting in this First Party SEP are provided power from Colorado Springs Utilities, billed directly to the Cherokee Metropolitan District in accordance with the current commercial rate tariff. There is an annual energy cost savings of $1,726 to be realized under the current rates and assumptions of use recited in Attachment CMD-1. This cost savings will be directly reflected as a reduction in the Cherokee Metropolitan District (CMD) cost of service to its constituents. It is a comparatively small incremental reduction as the total CMD use of funds for operations in 2013 was approximately $10,300,000 exclusive of capital improvements and additions, renewals and replacements. Maintenance requirements will be reduced by more than 50% based on the expected useful added life cycle of the LED lamp assemblies noted above, recognizing reductions in maintenance vehicle use and disposal of MH lamps. The proposed LED lamp assemblies are rated at a useful life of 100,000. The estimated savings in reduced maintenance cost due to the longer useful life of the LED light assemblies likewise will be reflected in a reduced cost of service to the District's constituents. The annual savings in maintenance cost as a result of this SEP are not significant in relation to the District's total expenditures for operations reflected above.

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EXHIBIT B

	Existing high pressure sodium and mercury vapor lamps removed from the District's facilities will be reused if possible and mercury vapor lamps will be disposed of using federal guidelines.

Project Budget

Refer to the Budget Discussion below and Attachment CMD-1.

Category	Description	Cost
Personnel - Salaries, Wages. (Include rates and # of hrs.)	CMD Superintendent-Direct time spent on project management, evaluation of contractor proposals & management of accounts payable: 30 hrs @ $60	$ 1,800
Materials and Supplies		
Equipment		
Contractors/ Subcontractors	Electrical contractor labor, equipment and materials	$11,361
	GMS, Inc. Engineering Consultants	$ 2,500
Other Direct Costs	Publication of Request for proposals; Final report to CMD constituents	$ 800
	Total:	**$16,461**

Budget Discussion

- Describe how all costs were determined and how they relate to the project. All project costs must be clearly and solely attributable to the proposed SEP and cannot include administrative overhead or indirect expenses.
  - The project costs have been developed from electrical contractor quotations for work at the Cherokee Ridge Golf Course and extrapolated to work at the CMD office and maintenance facility. The project budget does not include any general and administrative overhead or indirect expenses. It includes only costs directly associated with performance/implementation of the project. Refer to Attachment CMD-2.
- Quantify any financial or other benefit (i.e. maintenance costs) to the regulated entity resulting from the implementation of this project.
  - The estimated total annual cost savings from this project is $2,064 (including $1,726 in energy costs and $338 in maintenance costs) providing an 8 year payback period. The savings in energy costs at the CMD facilities will directly impact the cost of service to the CMD constituents.
- Describe the availability of funding for this project from sources other than SEP contributors. Include sources of funding, secured and applied for, directly related to this SEP.
  - The funding for this project will be provided solely by the regulated entity, the CMD. No other funding source will be available or utilized.

This project as developed will not be completed without this funding. Replacements will be converted as part of routine maintenance or capital upgrades without LED lighting.

Project Schedule

Activities and Deliverables	Staff Responsible	Due Date
Proposed Start Date	Art Sintas, Superintendent, Cherokee Metropolitan District (CMD)	Within 30 days of the effective date of the Consent Order
Solicit and receive contractor proposals for labor, equipment and materials	Project Manager, GMS, Inc., Consulting Engineers	May 5, 2014
Award contract for retrofit of MH fixtures with LED lamp assemblies	Board of Directors, CMD	June 11, 2014

	Initiate construction contract implementation, commence LED lamp assembly installations	Electrical Contractor TBD	July 7, 2014
	Biannual Status Report Due Date	CMD Superintendent & GMS, Inc. Project Manager	July 30, 2014
	Projected Completion Date	CMD Superintendent & GMS, Inc. Project Manager	November 30, 2014
	SEP Completion Report Due	CMD Superintendent & GMS, Inc. Project Manager	December 30, 2014
Reporting Requirements	<u>Biannual Status Reports</u> The CMD will submit a semiannual project status report to the Department's SEP Coordinator. Status reports will include the following information reported on the Department's Status Report Form: • A description of activities completed to date; • A budget summary table listing funds expended to date by budget category; and • A discussion of any anticipated changes to the project scope or timeline. <u>SEP Completion Report</u> The SEP Completion report will be submitted within 30 days of project completion and contain at a minimum: • A detailed description of the project as implemented; • A summary table identifying project deliverables and tasks along with the associated completion date; • A description of any operating problems encountered and the solutions thereto; • A full expense accounting including itemized costs, documented by copies of purchase orders, contracts, receipts or canceled checks; • Certification and demonstration that the SEP has been fully implemented pursuant to the provisions of the Settlement Agreement aka Compliance Order on Consent and this SEP Agreement; • A description of the environmental and public health benefits resulting from implementation of the SEP along with **quantification** of the outcomes and benefits; Additional information will include: • Examples of brochures, educational or outreach materials developed or produced as part of the SEP; and • Photographs documenting the project.		

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EXHIBIT B

Other Relevant Information	The CMD will execute this project using competitively procured proposals from qualified electrical contractors. The cost of the contractors work and any other direct project related costs will be documented and reported to CDPHE in the Final SEP Report. The CMD proposes to apply the cost of this project at a ratio of 1.5 to 1 to the monetary penalty agreed with the Colorado Department of Public Health and Environment. With an estimated project cost of $16,461, the offset to the monetary penalty assessed with be $10,974. This project is not required by any local land use regulation, building code or utility purveyor requirement. The CMD's constituents will realize the benefit of reduced cost of energy for lighting the public facilities of the District. There will be a reduced greenhouse gas (CO_2) emission as the result of reduced energy required to service the District facilities.
Has the applicant entered into any prior commitments to fund or implement this project, voluntary or otherwise? If yes, please explain.	No

ATTACHMENT CMD-1

EXHIBIT B

Cherokee Metropolitan District
2012-2014 Compliance Order
FIRST PARTY SEP - LED Lamp Replacement SEP at CMD Facilities

								Total	
Current Fixture									
Type	Metal Halide Mercury Vapor Pump Station	Metal Halide Pole-HPS Office-Parking	Metal Halide Pole-HPS CRGC	Metal Halide Wall-HPS Office-Vehicle Doors	Metal Halide Wall-HPS Office-Vehicle Doors	Metal Halide Wall-HPS CRGC-Storage	Metal Halide Wall-HPS CRGC-West Deck		
Watt Rating	70x2	400	400	150	70	400	70		
Power Consumption (watts)	173	468	468	185	94	468	94		
Proposed Fixture									
Type	LED	LED	LED	LED	LED	LED	LED		
Wattage	50	85	85	50	30	85	50		
Power Consumption (watts)	38	58	58	38	27	58	38		
Quantity	1	5	4	4	2	1	1	18	
Annual Estimated Energy Savings (kWh)									
Power Consumption (watts)									
Current Fixture	173	468	468	185	94	468	94		
Proposed Fixture	38	58	58	38	27	58	38		
Energy Savings (watts/fixture)	135	410	410	147	67	410	56		
Annual Operating Hours (1)	4,289	4,289	4,289	4,289	4,289	4,289	4,289		
Energy Savings (kWh/fixture)	579	1,758	1,758	630	287	1,758	240		
Quantity	1	5	4	4	2	1	1		
Annual Est. Energy Savings (kWh)	579	8,792	7,034	2,522	575	1,758	240	21500	$ 0.766 =$/kWh Reduced
Annual Estimated Energy Cost Savings									
Annual Est Energy Savings (kWh)	579	8,792	7,034	2,522	575	1,758	240		
Energy Cost ($/kWh) (2)	$0.0803	$0.0803	$0 0803	$0.0803	$0.0803	$0.0803	$0.0803		
Annual Est. Energy Cost Savings (3)	$46 49	$705.99	$564.79	$202.50	$46.15	$141.20	$19.29	$1,726 41	
Annual Estimated Maintenance Cost Savings									
Current Fixture									
Lamp Replacement Cost	$407 50	$402 50	$402.50	$397.50	$392.50	$402.50	$392 50		
Estimated Lamp Life (hours)	40,000	40,000	40,000	40,000	40,000	40,000	40,000		
Annual Operating Hours (1)	4,289	4,289	4,289	4,289	4,289	4,289	4,289		
Lamp Replacement Interval (yrs)	9 33	9 33	9.33	9.33	9.33	9.33	9 33		
Annual Replacement Cost per Fixture	$43.69	$43.16	$43.16	$42.62	$42.08	$43 16	$42 08		
Quantity	1	5	4	4	2	1	1		
Total Annual Replacement Cost	$43.69	$215.78	$172 62	$170 48	$84.17	$43.16	$42.08	$771.98	
Proposed Fixture									
Lamp Replacement Cost	$557.50	$577.50	$577 50	$557 50	$502.50	$577.50	$557.50		
Estimated Lamp Life (hours)	100,000	100,000	100,000	100,000	100,000	100,000	100,000		
Annual Operating Hours (1)	4,289	4,289	4,289	4,289	4,289	4,289	4,289		
Lamp Replacement Interval (yrs)	23 32	23.32	23 32	23 32	23.32	23.32	23.32		
Annual Replacement Cost per Fixture	$23.91	$24.77	$24 77	$23 91	$21.55	$24.77	$23.91		
Quantity	1	5	4	4	2	1	1		
Total Annual Replacement Cost (3)	$23.91	$123.84	$99.07	$95 64	$43.10	$24.77	$23 91		
Annual Est. Maintenance Cost Savings	$19 78	$91.94	$73.55	$74.84	$41.06	$18.39	$18 17	$337.74	

(1) Based on average operating time of 11 75 hours per day
Winter solstice = 4 45 pm to 6 45 am (MST) = 14 hrs, Summer solstice = 8 45pm to 6 15 am (MDT) = 9 5 hrs, Avg = 11 75 hrs

(2) Energy Cost Calculation Based on CSU Rates to CMD Sept 2013

Access Charge ($/kWh) = $0 0532
Supply Charge ($/kWh) = $0 0269
Electric Cost Adjustment (ECA) ($/kWh) = -$0 0010
Capacity Charge ($/kWh) = $0 0012
Energy Cost ($/kWh) = $0 0803

(3) CSU's rate tariff for street lights is based on Charge per pole per month The current charges, as of Jan 1, 2014, for 100 watt fixtures are
100 Watt Metal Halide (MH) - Ornamental = $12 42, Current Annual User Charge = $4,769 28
100 Watt Equivalent LED - Ornamental = $12 14, Future Annual User Charge with LED Retrofit = $4,661 76, $107 52 per year less than existing MH based charge

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EXHIBIT B

SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEP) FIRST PARTY PROPOSAL/AGREEMENT

The regulated entity, identified below, submits the following SEP application to the Colorado Department of Public Health and Environment (the department) for SEP consideration.

Enforcement Action Information	Cherokee Metropolitan District Case No.: ~~MC-14xxxx-x~~ MC-140514-1
Regulated Entity Contact Information	Sean Chambers, General Manager Cherokee Metropolitan District 6250 Palmer Park Boulevard Colorado Springs, CO 80915 Office Phone: 719-597-5080 E-mail Address: SChambers@cherokeemetro.org
CDPHE Contact Person	Rachel Wilson-Roussel, Supplemental Environmental Projects Coordinator, 303-692-2976, rachel.wilson-roussel@state.co.us -and- Mike Harris, WQCD Compliance and Enforcement Unit Manager, 303-692-3598, michael.harris@state.co.us
Geographical Area to Benefit Most Directly From Project	Westerly portion of Cherokee Metropolitan District Street Light Service Area provided electric power by Colorado Springs Utilities
Project Title	LED Streetlight Project
Project Type	**First Party SEP**
SEP Category	Pollution Prevention
Project Summary	This project would replace 41 existing high pressure sodium or mercury vapor (metal halide) streetlight lamps with high efficiency LED lamps. Energy consumption would be reduced by over 50 percent and the driving public and impacted pedestrians would have improved lighting. Hazard exposure to lighting maintenance personnel would be reduced because of longer LED lamp life.

Project Description	This project would replace forty-one (41) 100 watt high pressure sodium (HPS) or mercury vapor ornamental exterior light fixtures with LED lamp assemblies using less than one half of the energy for an equivalent light output. The locations selected for consideration in this project include a residential collector street (Piros Drive) at a school campus, 100 watt fixtures on Palmer Park Boulevard west of Peterson Road and street lights in the Cimarron Industrial Park. In addition, 100 watt fixtures at Hathaway Drive and Peterson Road between Palmer Park Blvd and Galley Road are considered in this project. The objective is to reduce energy consumption by over 50% which would reduce the carbon footprint relative to lights presently in use. Existing lamps have a design life of 40,000 hours while LED lamps are anticipated to last 100,000 hours. This increase in lamp life reduces maintenance vehicle usage for replacement and lowers maintenance crew exposure to vehicle hazards while working in the roadway. Implementation would consist of design, permitting, materials ordering and installation. Colorado Springs Utilities Energy Services Division will coordinate and administer the project with all labor, equipment and materials being furnished by and through Colorado Springs Utilities. This will be done initially with a unit priced, time and materials work order arrangement between CSU and CMD. The work order will be jointly developed and administered by CSU and CMD to fit the desired expenditure with the greatest benefit to the Cherokee Metropolitan District service area.
Expected Environmental and/or Public Health Benefits	**Calculated Benefits:** Refer to Attachment CSU-1 for a demonstration of the estimated annual energy and energy consumption cost savings from this SEP. This attachment also shows the calculated annual savings in maintenance costs as a result of implementation of this SEP. Summary: Annual Estimated Energy Savings = 10,709 kWh Annual Calculated Energy Cost Savings = $860 Annual Calculated Maintenance Cost Savings = $1,009 These cost savings would only be realized if CMD was paying the energy consumption charges and maintenance costs directly. However, CMD pays Colorado Springs Utilities on a per lamp per month basis. See actual benefits discussion below. **Actual Benefits:** This project will reduce energy consumption by approximately 10,709 kWh per year. This represents an annual reduction of 7 to 13 tons of CO_2 depending on generation mix. Maintenance vehicle use and associated CO_2 production will be reduced by more than 50% based on the expected lamp life extension noted above. If the existing metal halide lamps have an effective service life of 40,000 hours, the maintenance vehicle and labor requirements may well be 60% less when this SEP using LED lamp assemblies is implemented. The major environmental benefit of this SEP is the reduction in energy consumption and the related environmental effects from power generation with fossil fuels. Because CMD pays for streetlights on a per lamp per month basis, the calculated cost savings from lower energy consumption and maintenance costs listed above will **not** be realized. CMD's **actual cost savings** will be approximately **$142.20** per year from the implementation of this SEP. Additional details can be found in the Budget Discussion section. Existing high pressure sodium lamp heads removed from the system will be reused if possible and mercury vapor lamps will be disposed of using federal guidelines. Existing

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EXHIBIT B

mercury vapor lamps have been and will be permanently removed from service in the CSU system.

Project Budget

Refer to Attachment CSU-2 for the preliminary work order and contract with Colorado Springs Utilities.

Budget Category	Description	SEP Funds	Matching Funds	Total Cost
Personnel (Salaries, Wages)	Lineman, apprentice, barricading, supervision, reporting	$9,555		$9,555
Materials and Supplies	100 watt equivalent LED fixtures	$10,257		$10,257
Major Equipment	Bucket truck, material truck	$492		$492
Contractors/ Subcontractors	NONE – Install by Colorado Springs Utilities	$0		$0
Other Direct Costs	Minor materials used and disposal of existing MH Lamps			
	Total:	**$20,304**	**$0**	**$20,304**

Budget Discussion

Note: Budget based on Colorado Springs Utilities preliminary contract issued March 20, 2014. See Attachment CSU-2.

The comparatively low annual energy expenditures avoided with implementation of this SEP are a result of the selection of 100 watt rated lamps for retrofitting in the project. The 100 watt fixtures were selected because, under the current rate tariff, this is the only street light installation resulting in a user charge equal to or less than that for metal halide lamp installations. The District has sought to avoid an increase in on-going operations cost as a result of this SEP. Please refer to the footnotes on Attachment CSU-1.

Although Colorado Springs Utilities has indicated the unit charge for LED street light installations will likely be reduced in the future, the amount and schedule or timing of that possible rate reduction is undefined. Thus, the District deems it most prudent to pursue retrofitting those installations which will not immediately adversely impact the District cost of service to its customers.

As of January 1, 2014, the rate for high pressure sodium and LED lamp assemblies was $12.42 and $12.14 per month per pole respectively for ornamental pole installations. The current rate schedule provides for the 100 watt equivalent LED lamps on an "ornamental" pole to be $3.36 per year per pole less cost to the District than the existing 100 watt metal halide installations.

The classification of "ornamental" installations includes the common aluminum pole with either a mast arm or top mounted luminaire. The "Colonial" fixture identified in Attachment CSU-1 is a top mounted luminaire in a hooded four-sided fixture requiring a LED lamp assembly having a current retail cost exceeding that for a similar "cobrahead" fixture.

This project as developed will not be completed without this funding. Replacements will be covered as part of routine capital upgrades without LED lighting in accordance with current tariffs. There are no local land use regulations, CMD service plan requirements or regulations of the electric utility which requires the CMD to initiate this project.

EXHIBIT B

	Activities	Staff Responsible	Date
Project Schedule and Work Plan	Project Start Date	Colorado Springs Utilities (CSU), Energy Services Division	May 19, 2014
	Material delivery	CSU, Energy Services Division	July 31, 2014
	Status Report(s) Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	August 15, 2014
	Projected Completion Date	CSU and CMD Superintendent	November 30, 2014
	SEP Completion Report Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	December 20, 2014
Other Relevant Information	This project is not required by any local land use regulation, building code or utility purveyor requirement. The CMD's constituents will not immediately realize the benefit of reduced cost of energy for lighting in the District until CSU accomplishes a cost of service study with the latest in LED lamp technology considered. There will be reduced greenhouse gas (CO_2) emissions as the result of reduced energy required to service the District facilities		
Reporting Requirements	Biannual Status Reports The CMD SEP Administrator will submit a biannual project status report to the department's SEP Coordinator. Status reports will include the following information: • A description of activities completed to date; • A budget summary table listing funds expended to date by budget category; and • A discussion of any anticipated changes to the project scope or timeline. Final SEP Completion Report The SEP Completion report will be submitted within 30 days of project completion and contain at a minimum: • A detailed description of the project as implemented; • A summary table identifying project deliverables and tasks along with the associated completion date; • A description of any operating problems encountered and the solutions thereto; • A full expense accounting including itemized costs, documented by copies of purchase orders, contracts, receipts or canceled checks; • Certification and demonstration that the SEP has been fully implemented pursuant to the provisions of the Settlement Agreement aka Compliance Order on Consent and this SEP Agreement; • A description of the environmental and public health benefits resulting from implementation of the SEP along with **quantification** of the outcomes and benefits; • Examples of brochures, educational or outreach materials developed or produced as part of the SEP; and • Photographs documenting the project.		

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ATTACHMENT CSU-1
EXHIBIT B

Cherokee Metropolitan District
2012-2014 Compliance Order
LED Lamp Replacement SEP

Current Fixture			Total			
Type	Metal Halide Cobrahead	Metal Halide Colonial				
Watt Rating	100	100				
Power Consumption (watts)	127	118				
Proposed Fixture						
Type	LED Cobrahead	LED Colonial				
Wattage						
Power Consumption (watts)	66	58				
Quantity	37	4	41			
Annual Estimated Energy Savings (kWh)						
Power Consumption (watts)						
Current Fixture	127	118				
Proposed Fixture	66	58				
Energy Savings (watts/fixture)	61	60				
Annual Operating Hours (1)	4,289	4,289				
Energy Savings (kWh/fixture)	262	257				
Quantity	37	4				
Annual Est. Energy Savings (kWh)	9,680	1,029	10,709	129%	$ 1.896	=$/KWH Reduction
Annual Estimated Energy Cost Savings						
Annual Est. Energy Savings (kWh)	9,680	1,029				
Energy Cost ($/kWh) (2)	$0.0803	$0.0803				
Annual Est. Energy Cost Savings (3)	$777.28	$82.65	$859.93			
Annual Estimated Maintenance Cost Savings						
Current Fixture						
Lamp Replacement Cost	$412.50	$462.50				
Estimated Lamp Life (hours)	40,000	40,000				
Annual Operating Hours (1)	4,289	4,289				
Lamp Replacement Interval (yrs)	9.33	9.33				
Annual Replacement Cost per Fixture	$44.23	$49.59				
Quantity	37	4				
Total Annual Replacement Cost	$1,636.43	$198.35				
Proposed Fixture						
Lamp Replacement Cost	$450.00	$650.00				
Estimated Lamp Life (hours)	100,000	100,000				
Annual Operating Hours (1)	4,289	4,289				
Lamp Replacement Interval (yrs)	23.32	23.32				
Annual Replacement Cost per Fixture	$19.30	$27.88				
Quantity	37	4				
Total Annual Replacement Cost (3)	$714.08	$111.51				
Annual Est. Maintenance Cost Savings	$922.35	$86.85	$1,009.20			

(1) Based on average operating time of 11.75 hours per day
Winter soltice = 4:45 pm to 6:45 am (MST) = 14 hrs; Summer soltice = 8:45pm to 6:15 am (MDT) = 9.5 hrs;

(2) Energy Cost Calculation Based on CSU Rates to CMD Sept 2013

Access Charge ($/kWh) = $0.0532
Supply Charge ($/kWh) = $0.0269
Electric Cost Adjustment (ECA) ($/kWh) = -$0.0010
Capacity Charge ($/kWh) = $0.0012
Energy Cost ($/kWh) = $0.0803

(3) CSU's rate tariff for street lights is based on Charge per pole per month. The current charges, as of Jan 1, 2014, for 100 watt fixtures are:

100 Watt Metal Halide (MH) - Ornamental = $12.42; Current Annual User Charge = $4,769.28

100 Watt Equivalent LED - Ornamental = $12.14; Future Annual User Charge with LED Retrofit = $5,972.88; $142.20 per year less than existing MH based charge.

EXHIBIT B

ATTACHMENT CSU-2

Colorado Springs Utilities
Contract for Time and Material
Third Party Billing

WHEREAS, the undersigned Applicant requests Springs Utilities (SU), to provide labor, services, materials and equipment, as described below, or on exhibits or addenda attached hereto and incorporated herein by reference for Applicant s benefit at the location commonly known as: **CHEROKEE METROPOLITAN DISTRICT.**

IT IS HEREBY AGREED that Applicant shall deposit with SU on or before **05/04/2014,** as a condition precedent to SU s obligation to provide said labor, services, materials and equipment, the sum of **$20,303.55**, which is the estimated cost of said labor, services, materials and equipment. This estimated sum is based upon a preliminary survey and analysis of the project as described by the Applicant. It is understood and agreed that the above estimated cost is subject to revision based upon the actual cost, as determined by SU after completion of the project. Applicant agrees to pay the actual cost of the project in full, as determined by SU, within ten (10) days after completion of the project and final billing. In the event the deposit is determined to be greater than the actual cost, as finally determined, SU shall refund the difference within thirty (30) days of completion of the project and final billing. In the event Applicant fails to pay the actual cost within ten (10) days after final billing, SU shall have the right to recover the actual costs, damages, including incidental and consequential damages, costs of collection, attorney s fees and interest on the amount owing at the statutory rate under Colorado law.

SU, its employees and agents, shall have the right to enter upon the Applicant s property, as described below, at all reasonable hours as necessary to provide the labor, services, materials and equipment described herein.

Applicant warrants and represents to SU that the individual executing this Contract on behalf of the Applicant has authority to bind the Applicant, its successors and assigns.

The laws of the State of Colorado shall apply to this Contract for Time and Material and the construction or enforcement thereof.

In the event the Applicant requests a modification to the labor, materials, services and equipment described below, or in the event it is necessary for SU to perform additional or other labor, services, materials and equipment to complete the project, the Applicant agrees to pay for the additional costs and payment thereof will be made in accordance with the terms of this Contract. The Applicant or the Applicant s representative shall execute a contract addendum describing additional labor, services, materials and equipment as requested or required by SU, upon request of SU. SU shall have discretion to require additional amounts be paid, or the entire cost of additional labor, services, materials and equipment be paid prior to commencement of work on such additions or modifications.

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EXHIBIT B

Location of Job: **CHEROKEE METROPOLITAN DISTRICT**

Type of Service Requested: **REPLACE 41 STREETLIGHT LUMINAIRES WITH LED LUMINAIRES**

Charges

Total Material including credit and handling charges		$0.00
Total Labor Charges		$9,554.96
Total Tool & Vehicle Charges		$491.59
Total		$10,046.55
Additional Charges	+	$10,257.00
Total Job Cost		$20,303.55
Customer Credit	-	$0.00
Total Amount Due		$20,303.55

Special instructions on billing:

Ginny Halvorson Energy Services

Applicant

20-Mar-2014
Date

By: _____
Title

2680028-01
Work Order Number

Company Name

Address

City, State, Zip Code

Date

Phone Number

FE-16
7/25/95

EXHIBIT B

SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEP) FIRST PARTY PROPOSAL/AGREEMENT

The regulated entity, identified below, submits the following SEP application to the Colorado Department of Public Health and Environment (the department) for SEP consideration.

Enforcement Action Information	Cherokee Metropolitan District Case No.: ~~MC-14xxxx-x~~ MC-140514-1
Regulated Entity Contact Information	Sean Chambers, General Manager Cherokee Metropolitan District 6250 Palmer Park Boulevard Colorado Springs, CO 80915 Office Phone: 719-597-5080 E-mail address: SChambers@cherokeemetro.org
CDPHE Contact Person	Rachel Wilson-Roussel, Supplemental Environmental Projects Coordinator, 303-692-2976, rachel.wilson-roussel@state.co.us -and- Mike Harris, WQCD Compliance and Enforcement Unit Manager, 303-692-3598, michael.harris@state.co.us
Geographical Area to Benefit Most Directly From Project	Easterly portion of Cherokee Metropolitan District Street Light Service Area provided electric power by Mountain View Electric Association
Project Title	LED Streetlight Project
Project Type	**First Party SEP**
SEP Category	Pollution Reduction, Public Health and Safety
Project Summary	This project would replace 15 existing high pressure sodium or mercury vapor (metal halide) streetlight lamps with high efficiency LED lamp assemblies. Energy consumption would be reduced by approximately 60 percent and the driving public and impacted pedestrians would have improved lighting. Hazard exposure to lighting maintenance personnel would be reduced because of longer LED lamp life.

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EXHIBIT B

Project Description	This project would replace no less than 15 metal halide street light luminaires with LED lamp assemblies using less than one half of the energy for an equivalent light output. The intent is to replace existing 400 watt fixtures with LED heads that have a comparable light output. The locations to be selected are along major and minor arterial roadways and collector streets where the public roadway users may have the maximum benefit from the project. The objective is to reduce energy consumption by approximately 60% which would reduce the carbon footprint relative to lights presently in use. Existing lamps have a design life of 40,000 hours while LED lamps are anticipated to last 100,000 hours. This increase in lamp life reduces maintenance vehicle usage for replacement and lowers maintenance crew exposure to vehicle hazards while working in the roadway. Implementation would consist of design, permitting, materials ordering and installation. The Mountain View Electric Association (MVEA) will implement the project with all labor, equipment and materials being furnished by and through MVEA. This will be done initially with a unit priced, time and materials work order arrangement between MVEA and CMD. The work order will be jointly developed and administered by MVEA and CMD to fit the desired expenditure with the greatest benefit to the Cherokee Metropolitan District service area.
Expected Environmental and/or Public Health Benefits	**Calculated Benefits:** Refer to Attachment MVEA-1 for a demonstration of the estimated annual energy and energy consumption cost savings from this SEP. This Attachment MVEA-1 also shows the calculated annual savings in maintenance costs as a result of implementation of this SEP. **Summary:** Annual Estimated Energy Savings = 15,214 kWh Annual Calculated Energy Cost Savings = $1,655 See Below Annual Calculated Maintenance Cost Savings = $366 The calculated cost savings would only be realized if CMD was paying the energy consumption charges and maintenance costs directly. However, CMD pays Mountain View Electric on a per lamp per month basis. See actual benefits discussion below. **Actual Benefits** This project will reduce energy consumption by approximately 15,214 kWh per year. This represents an annual reduction of 9.1 to 18.3 tons of CO_2 depending on generation mix. Maintenance vehicle usage and associated CO_2 production will be reduced by more than 50% based on the expected lamp assembly life extension noted above. The MVEA does not presently have a different tariff for LED street lighting. Based on discussions with the MVEA management and Directors, there will be a rate study accomplished in the near future. In the meantime, as this SEP is implemented by the MVEA, the current rate tariff for street lighting will apply. This is a unit charge per pole, without a direct relationship to energy consumption. While there is not expected to be any actual cost savings as a result of this SEP, there will be an energy consumption reduction with implementation of this SEP. The reduction in maintenance vehicle operation should be reasonably directly proportional to the difference in service life for the LED lamp assemblies as compared to the metal halide lamps. Based on comparative service life cycles of 40,000 and 100,000 hours respectively for metal halide and LEDs, the maintenance vehicle operation will be reduced more than 50 percent.

EXHIBIT B

Existing high pressure sodium lamp heads removed from the system will be reused if possible and mercury vapor lamps will be disposed of using federal guidelines. Mercury vapor lamps will be removed from service in the MVEA public street and security lighting system.

Project Budget

Refer to Attachment MVEA-1

Budget Category	Description	SEP Funds	Matching Funds (if any)	Total Cost
Personnel (Salaries, Wages)	Lineman, apprentice, barricading, supervision, reporting	$2,720		$2,720
Materials and Supplies	20– 400 watt equivalent LED pole mounted fixtures	$9,750		$9,750
Major Equipment	Bucket truck, material truck	$1,000		$1,000
Contractors/ Subcontractors	NONE – Install by MVEA staff using MVEA equipment	$0		$0
Other Direct Costs	Minor materials used and disposal of existing MH Lamps	$400		$400
	Total:	$13,870	**$0**	$13,870

Budget Discussion

Note: Budget based on $650 per lamp with MVEA engineering and procurement support.

The project budget for this SEP to be implemented by the MVEA was based on the unit cost of retrofitting similar existing metal halide street light installations as presented by the EPCDOT. As the final work order is developed with the MVEA, the scope of work will be adjusted to provide for an expenditure conforming to the requirements of the CDPHE. In general, the scope of work will be adjusted if necessary to provide for a monetary contribution to this "first party" project in an amount no less than that shown in the referenced budget.

As indicated in the discussion of environmental benefits of this SEP, there is no known financial benefit to the Cherokee Metropolitan District. As of this time, the MVEA will be assessing the same user charges for the LED street lights as are now billed for the metal halide installations. The MVEA has indicted they will be doing a rate study to assess the cost of the LED street light installations. There is no indication if the resulting user charge will be less or more than that assessed for metal halide street light installations.

This project as developed will not be completed without this funding. Replacements will be covered as part of routine capital upgrades without LED lighting in accordance with current tariffs. There are no local land use regulations, CMD service plan requirements or regulations of the electric utility which requires the CMD to initiate this project.

Project Schedule and Work Plan

Activities	Staff Responsible	Date
Project Start Date	Cherokee/ MVEA	May 5, 2014
Material delivery	MVEA	July 1, 2014
Status Report(s) Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	August 15, 2014
Projected Completion Date	MVEA and CMD Superintendent	November 30, 2014

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EXHIBIT B

	SEP Completion Report Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	December 20, 2014
Other Relevant Information	This project is not required by any local land use regulation, building code or utility purveyor requirement. The CMD's constituents will not immediately realize the benefit of reduced cost of energy for lighting in the District until MVEA accomplishes a cost of service study with the latest in LED lamp technology considered. There will be reduced greenhouse gas (CO_2) emissions as the result of reduced energy required to service the District facilities		
Reporting Requirements	<u>Biannual Status Reports</u> The CMD SEP Administrators will submit a biannual project status report to the department's SEP Coordinator. Status reports will include the following information: • A description of activities completed to date; • A budget summary table listing funds expended to date by budget category; and • A discussion of any anticipated changes to the project scope or timeline. <u>Final SEP Completion Report</u> The SEP Completion report will be submitted within 30 days of project completion and contain at a minimum: • A detailed description of the project as implemented; • A summary table identifying project deliverables and tasks along with the associated completion date; • A description of any operating problems encountered and the solutions thereto; • A full expense accounting including itemized costs, documented by copies of purchase orders, contracts, receipts or canceled checks; • Certification and demonstration that the SEP has been fully implemented pursuant to the provisions of the Settlement Agreement and this SEP Agreement; • A description of the environmental and public health benefits resulting from implementation of the SEP along with **quantification** of the outcomes and benefits; • Examples of brochures, educational or outreach materials developed or produced as part of the SEP; and • Photographs documenting the project.		

EXHIBIT B

ATTACHMENT MVEA-1

Cherokee Metropolitan District
2012-2014 Compliance Order
Mountain View Electric Association (MVEA) LED Lamp Replacement SEP - 04/15/14

Current Fixture			
Type	Metal Halide Cobrahead		
Watt Rating	400		
Power Consumption (watts)-EPCDOT Data	400		
Proposed Fixture			
Type	LED Cobrahead		
Watt Rating	400		
Power Consumption (watts)	163.5		
Quantity	15		
Annual Estimated Energy Savings (kWh)			
Power Consumption (watts)			
Current Fixture	400		
Proposed Fixture	163.5		
Energy Savings (watts/fixture)	236.5		
Annual Operating Hours (1)	4,289		
Energy Savings (kWh/fixture)	1,014		
Quantity	15		
Annual Est. Energy Savings (kWh)(4)	15,214	$ 0.912	=$/kWh Reduced
Annual Estimated Energy Cost Savings			
Annual Est. Energy Savings (kWh)	$15,214		
Energy Cost ($/kWh) (2)	$0.1088		
Annual Est. Energy Cost Savings	$1,655		
Annual Estimated Maintenance Cost Savings			
Current Fixture			
Lamp Replacement Cost	$412.50		
Estimated Lamp Life (hours)	40,000		
Annual Operating Hours (1)	4,289		
Lamp Replacement Interval (yrs)	9.33		
Annual Replacement Cost per Fixture	$44.23		
Quantity	15		
Total Annual Replacement Cost(4)	$663.42		
Proposed Fixture			
Lamp Replacement Cost(3)	$462.50		
Estimated Lamp Life (hours)	100,000		
Annual Operating Hours (1)	4,289		
Lamp Replacement Interval (yrs)	23.32		
Annual Replacement Cost per Fixture	$19.84		
Quantity	15		
Total Annual Replacement Cost(4)	$297.53		
Annual Est. Maintenance Cost Savings(4)	$365.88		

(1) Based on average operating time of 11.75 hours per day
Winter soltice = 4:45 pm to 6:45 am (MST) = 14 hrs; Summer soltice = 8:45pm to 6:15 am (MDT) = 9.5 hrs; Avg = 11.75 hrs

(2) Comparative MVEA Rates for Commercial General Power = $0.0725 per kWh Plus Grid Access and Demand Charges
MVEA Small Power Rate schedule, per kWh = $0.1088

(3) LED Replacement Lamp Cost =$125; Equipment Cost =$150 per hour; Labor Cost = $75 per hour; 1.5 hours to replace lamp

(4) MVEA's rate tariff for street lights is based on charge per pole per month. The current charges, as of Jan 1, 2014, for 400 watt fixtures are:
400 Watt Metal Halide (MH) = $18.90; Current Annual User Charge = $3,402
400 Watt Equivalent LED rate has not been established pending rate study by MVEA; For purposes of SEP evaluation, assume LED rate tariff is equal to MH rate tariff.
400 Watt Equivalent LED = $18.90, Future Annual User Charge with LED Retrofit = $3,402, $0.00 per year less than existing MH based charge.

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EXHIBIT B

SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEP) THIRD PARTY PROPOSAL/AGREEMENT

The regulated entity, identified below, submits the following SEP application to the Colorado Department of Public Health and Environment (the department) for SEP consideration.

Enforcement Action Information	Cherokee Metropolitan District Case No.: ~~MC-14xxxx-x:~~ MC-140514-1	
Regulated Entity Contact Information	Sean Chambers, General Manager Cherokee Metropolitan District 6250 Palmer Park Boulevard Colorado Springs, CO 80915 719-597-5080 SChambers@cherokeemetro.org	
Third Party SEP Administrator Contact	Mr. John Clack El Paso County Department of Public Services 3275 Akers Drive Colorado Springs, CO 80922 Office Phone: 719-520-6851 E-mail address: JohnClack@elpasoco.com	Type of organization: Non–profit* ____ Government __X_ *If non-profit, please attach a copy of your 501c(3) exemption to this SEP Agreement.
CDPHE Contact Person	Rachel Wilson-Roussel, Supplemental Environmental Projects Coordinator, 303-692-2976, rachel.wilson-roussel@state.co.us -and- Mike Harris, WQCD Compliance and Enforcement Unit Manager, 303-692-3598, michael.harris@state.co.us	
Geographical Area to Benefit Most Directly From Project	Cherokee Metropolitan District Street Light Service Area	
Project Title	LED Streetlight Project	
Project Type	**Third Party SEP Donation**	
SEP Category	Pollution Reduction, Public Health and Safety	
Project Summary	This project would replace existing 22 high pressure sodium or mercury vapor (metal halide) streetlight lamps with high efficiency LED lamps. Energy consumption would be reduced by approximately 58 percent, the driving public and impacted pedestrians would have improved lighting. Hazard exposure to lighting maintenance personnel would be reduced because of longer LED lamp life.	

EXHIBIT B

Project Description	This project would replace twenty-two (22) 400 watt high pressure sodium (HPS) or mercury vapor street light fixtures with LED lamp assemblies using less than one half of the energy for an equivalent light output. The locations selected for consideration in this project include the following Constitution Avenue and Marksheffel Road – Four fixtures Constitution Avenue and Piros Drive – Two fixtures Peterson Road and Piros Drive – Three fixtures Peterson Road and Palmer Park Boulevard – Four fixtures Galley Road and Hathaway Drive – Four fixtures Peterson Road and Galley Road – Three fixtures Peterson Road and Omaha Boulevard – One fixture Palmer Park Boulevard and Winnebago Drive – One fixture The objective is to reduce energy consumption by approximately 58% which would reduce the carbon footprint relative to lights presently in use. Existing lamps have a design life of 24,000 hours while LED lamps are anticipated to last 100,000 hours. This increase in lamp life reduces maintenance vehicle usage for replacement and lowers maintenance crew exposure to vehicle hazards while working in the roadway. Implementation would consist of design, permitting, materials ordering and installation. The El Paso County Department of Public Services, Transportation Division, will coordinate and administer the project with all labor, equipment and materials being furnished by and through El Paso County (EPC). This will be done initially with a unit priced, time and materials work order arrangement between EPC and CMD. The work order will be jointly developed and administered by EPC and CMD to fit the desired expenditure.
Expected Environmental and/or Public Health Benefits	Refer to Attachment EPC-1 for a demonstration of the estimated annual energy and power cost savings from this SEP. This Attachment EPC-1 also shows the estimated annual savings in maintenance costs as a result of implementation of this SEP. Summary: Annual Estimated Energy Savings = 22,145 kWh Annual Estimated Energy Cost Savings = $2,237 Annual Estimated Maintenance Cost Savings = $1,028 Payback period: ~ 5.9 years Discussion: This project would reduce estimated energy consumption by 22,145 kWh per year. This represents an annual reduction of 13.3 to 26.6 tons of CO_2 depending on generation mix. Maintenance vehicle usage and associated CO_2 production will be reduced by more than 50% based on the expected life extension noted above. The EPC Department of Transportation has provided information on common replacement lamps for existing HPS fixtures reflecting a useful life of 23,000 hours. The proposed LED lamp assemblies are rated at a useful life of 100,000. Based on this ratio, there will be a reduction of 77% in the frequency or unit use of maintenance equipment when the LED assemblies are put into service. There are 16 of the 22 lamps located in the Mountain View Electric Association service area with 6 of the lamps provided power from Colorado Springs Utilities. Using a weighted energy user charge rate for the 22 lamps proposed for retrofitting, there is an annual energy cost savings of $2,237 realized. This cost savings will not be passed on

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to the Cherokee Metropolitan District as the subject street lighting fixtures are owned, operated and maintained by El Paso County, completely independent of the Cherokee Metropolitan District street lighting system. The estimated savings in reduced maintenance cost due to the longer useful life of the LED light assemblies likewise will not be passed on to the District's constituents. The energy cost savings are projected from the respective power companies' commercial energy charges applicable in their service areas. The basis of charge to EPC is on a per light basis in accordance with the applicable tariffs.

The District's constituents will not necessarily realize and cost benefits from this SEP but will be supporting the benefits of reduced energy consumption and generation of greenhouse gases and improved lighting of public spaces.

Existing high pressure sodium lamp heads removed from the system will be reused if possible and mercury vapor lamps will be disposed of using federal guidelines.

Project Budget

Budget Category	Description	SEP Funds	Matching Funds (if any)	Total Cost
Personnel (Salaries, Wages)	Lineman, apprentice, barricading, supervision, reporting	$3,640		$3,640
Materials and Supplies	22 – 400 watt equivalent pole mounted LED fixtures	$13,300		$13,300
Major Equipment	Bucket truck, material truck	$1,800		$1,800
Contractors/ Subcontractors	NONE – Install by El Paso County personnel & equipment	$0		$0
Other Direct Costs	Minor materials used and disposal of existing MH Lamps	$400		$400
	Total:	**$19,140**	**$0**	**$19,140**

Budget Discussion

This project as developed will not be completed without this funding. Replacements will be covered as part of routine capital upgrades without LED lighting. The project budget total was provided by the El Paso County (EPC) Public Services Department in an electronic mail message of February 15, 2014 from the EPC Project Manager, Mr. John Clack. Refer to Attachment EPC-2. The itemization given above is to be refined with EPC if necessary and will be itemized at project close-out.

Project Schedule and Work Plan

Activities	Staff Responsible	Date
SEP Donation of $19,140 from Cherokee Metro District to Third Party SEP Administrator, El Paso County	CMD Board of Directors, General Manager & Superintendent	Within 30 days of the effective date of this SEP Agreement.
Project Start Date	El Paso County Department of Public Services (EPC)	May 15, 2014
Material delivery	El Paso County Department of Public Services	July 16, 2014

EXHIBIT B

	Status Report(s) Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	August 15, 2014
	Projected Completion Date	EPC and CMD Superintendent	November 30, 2014
	SEP Completion Report Due to CDPHE	CMD Superintendent & GMS, Inc. Project Manager	December 20, 2014
Other Relevant Information	This project is not required by any local land use regulation, building code or utility purveyor requirement. The CMD's constituents will not realize the benefit of reduced cost of energy for lighting in the District. There will be reduced greenhouse gas (CO_2) emissions as the result of reduced energy required to service the District facilities and improved lighting will enhance vehicular traffic and pedestrian safety.		
Reporting Requirements	<u>Biannual Status Reports</u> The CMD and EPC SEP Administrator will submit a biannual project status report to the department's SEP Coordinator. Status reports will include the following information: • A description of activities completed to date; • A budget summary table listing funds expended to date by budget category; and • A discussion of any anticipated changes to the project scope or timeline. <u>Final SEP Completion Report</u> The SEP Completion report will be submitted within 30 days of project completion and contain at a minimum: • A detailed description of the project as implemented; • A summary table identifying project deliverables and tasks along with the associated completion date; • A description of any operating problems encountered and the solutions thereto; • A full expense accounting including itemized costs, documented by copies of purchase orders, contracts, receipts or canceled checks; • Certification and demonstration that the SEP has been fully implemented pursuant to the provisions of the Settlement Agreement and this SEP Agreement; • A description of the environmental and public health benefits resulting from implementation of the SEP along with **quantification** of the outcomes and benefits; • Examples of brochures, educational or outreach materials developed or produced as part of the SEP; and • Photographs documenting the project.		

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EXHIBIT B

ATTACHMENT EPC-1

Cherokee Metropolitan District
2012-2014 Compliance Order
El Paso County Public Services Dept. LED Lamp Replacement SEP

Current Fixture			
Type	Metal Halide Cobrahead		
Watt Rating	400		
Power Consumption (watts)-EPCDOT Data	400		
Proposed Fixture			
Type	LED Cobrahead		
Watt Rating-Equivalency per EPCDOT	400		
Power Consumption (watts)	165.3		
Quantity	22		
Annual Estimated Energy Savings (kWh)			
Power Consumption (watts)			
Current Fixture	400		
Proposed Fixture	165.3		
Energy Savings (watts/fixture)	234.7		
Annual Operating Hours (1)	4,289		
Energy Savings (kWh/fixture)	1,007		
Quantity	22		
Annual Est. Energy Savings (kWh)	22,145	$ 0.864	=$/KWH Reduced
Annual Estimated Energy Cost Savings			
Annual Est. Energy Savings (kWh)	22,144.53		
Energy Cost ($/kWh) (5)	$0.1010		
Annual Est. Energy Cost Savings	$2,236.72		
Annual Estimated Maintenance Cost Savings			
Current Fixture			
Lamp Replacement Cost (4)	$372.50		
Estimated Lamp Life (hours)	24,000		
Annual Operating Hours (1)	4,289		
Lamp Replacement Interval (yrs)	5.60		
Annual Replacement Cost per Fixture	$66.56		
Quantity	22		
Total Annual Replacement Cost	$1,464.43		
Proposed Fixture			
Lamp Replacement Cost(6)	$462.50		
Estimated Lamp Life (hours)	100,000		
Annual Operating Hours (1)	4,289		
Lamp Replacement Interval (yrs)	23.32		
Annual Replacement Cost per Fixture	$19.84		
Quantity	22		
Total Annual Replacement Cost	$436.38		
Annual Est. Maintenance Cost Savings	$1,028.05		

(1) Based on average operating time of 11.75 hours per day
Winter soltice = 4:45 pm to 6:45 am (MST) = 14 hrs; Summer soltice = 8:45pm to 6:15 am (MDT) = 9.5 hrs; Avg = 11.75 hrs

(2) Energy Cost Calculation Based on CSU Rates to CMD Sept 2013

Access Charge ($/kWh) =	$0.0532
Supply Charge ($/kWh) =	$0.0269
Electric Cost Adjustment (ECA) ($/kWh) =	-$0.0010
Capacity Charge ($/kWh) =	$0.0012
Energy Cost ($/kWh) =	$0.0803

Weighted blend of CSU & MVEA=((16/22)*0.10877)+((6/22)*0.0803)

(3) Comparative MVEA Rates for Commercial General Power = $0.0725 per kWh Plus Grid Access and Demand Charges
MVEA Small Power Rate schedule = $0.10877 per kWh;

(4) Lamp Cost =$35; Equipment Cost =$150 per hour; Labor Cost = $75 per hour; 1.5 hours to replace lamp

(5) Weighted blend of CSU & MVEA= $0.10101

(6) Lamp Cost =$125; Equipment Cost =$150 per hour; Labor Cost = $75 per hour; 1.5 hours to replace lamp

ATTACHMENT EPC-2

From: John Clack [JohnClack@elpasoco.com]
Sent: Saturday, February 15, 2014 6:15 AM
To: 'rjsams@gmsengr.com'
Cc: Andre Brackin; Troy Wiitala; Steve Barden
Subject: RE: street lights.doc
Roger,

Here is our estimate for the LED street lamps that would be purchased by Cherokee Metro District. These are listed by priority.

Constitution & Marksheffel Rd	4 lights	$3,480
Peterson & Palmer Park	4 lights	$3,480
Galley & Hathaway	4 lights	$3,480
Peterson & Galley	3 lights	$2,610
Constitution & Piros Dr	2 lights	$1,740
Peterson & Piros Dr	3 lights	$2,610
Palmer Park & Winnebago	1 light	$870
Peterson & Omaha	1 light	$870
Total	22 lights	$19,140

I understand our crews would install. Would we be responsible for purchasing the lights and then get reimbursed? If so, we will need to go out to bid using our regular process. Let me know if you need any additional information.

Thanks,
John

From: Roger Sams [mailto:rjsams@gmsengr.com]
Sent: Monday, December 09, 2013 9:46 AM
To: John Clack
Subject: RE: street lights.doc

John:

Thanks to you and other EPC staff for pulling this information together for us. We, and the CMD, would like to consider funding replacement of existing lamps with LED lamp assemblies at the locations listed as part of the Supplemental Environmental Project (SEP) the District is arranging with the Colorado Department of Health & Environment (CDPHE). We will also be working directly with Colorado Springs Utilities and MVEA on some locations where those respective utilities are responsible for operation and maintenance with the CMD paying for the energy costs. The District will have about $50,000 to $55,000 to put into this project for all parts and pieces with all three responsible agencies.

First, it would be greatly appreciated if the EPC Public Service Department could provide a proposal for replacement of the existing lamp assemblies as described at the locations listed below. Please itemize the proposal by intersection as we may not be able to do all of them within this project. We would appreciate your input as to priorities where LED lamps would yield the most public benefit. We would agree with making Constitution and Marksheffel a top priority if EPC would concur.

The schedule for this work is presently proposed to commence April 1, 2014 and be completed by November 30, 2014. The start date could just be the ordering of materials; physical replacement would not necessarily have to start at that time.

We need to refine the CMD proposal to the CDPHE by responsible third party, i.e. CSU, MVEA and EPC, so getting us the proposal as soon as possible would be greatly appreciated. We trust the EPC experience with the

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LED lamp installation at Constitution and Peterson will be useful in making the proposal for the 2014 work in the CMD service area.

Thank you again. Please let me know if you have any questions or desire additional information.

Roger J. Sams, P.E.
GMS, Inc.
611 North Weber Street, Suite 300
Colorado Springs, CO. 80903
Phone: 719-475-2935
Fax: 719-475-2938
Email: rjsams@gmsengr.com

From: John Clack [mailto:JohnClack@elpasoco.com]
Sent: Monday, December 09, 2013 9:04 AM
To: rjsams@gmsengr.com
Subject: FW: street lights.doc

Roger,

Attached the El Paso County maintained street lights within the Cherokee Metro District's area. I verified with Frank Biggerstaff that these are all non-LED street lights. Please let me know if you have any questions or need additional information.

Thanks,
John Clack
719-520-6851

From: Ed Braun
Sent: Tuesday, December 03, 2013 7:09 AM
To: John Clack
Subject: FW: street lights.doc

John,

Attached are the numbers for the luminaries for GMS, all within Cherokee's district.

Edgar Braun
Inspection Supervisor
El Paso County PSD
719-520-6869, Cell 719-339-5205

From: Frank Biggerstaff
Sent: Monday, December 02, 2013 4:50 PM
To: Ed Braun; Steve Barden
Subject: FW: street lights.doc

Inform you ask for.

Frank

From: Joe Ashe
Sent: Monday, December 02, 2013 4:10 PM
To: Frank Biggerstaff
Subject: street lights.doc

EXHIBIT B

Intersection	# Street Lights
Constitution & Marksheffel Rd	4
Constitution & Piros Dr	2
Peterson & Piros Dr	3
Peterson & Palmer Park	4
Palmer Park & Winnebago	1
Peterson & Omaha	1
Peterson & Galley	3
Galley & Hathaway	4
Total	22

APPENDIX G – AGENCY REVIEW TRANSMITTALS

ELEMENT ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

TRANSMITTAL FORM

To:	CDPHE WQCD – Engineering Section	Date:	June 15, 2018
	4300 Cherry Creek Drive South	Re:	Arrowhead Mobile Home Park
	Denver, CO 80246-1530	Job No.:	00013.0001
Attn:	Ms. Amy Zimmerman	From:	Nicholaus P. Marcotte, P.E.
		Phone:	(303) 378-2969

Via:

☐ Mail ☐ Fax ☐ FedEx ☒ Courier ☐ Other

Item List:

Copies	Description
2	Arrowhead Mobile Home Park 22.7 Site Application
2	Arrowhead Mobile Home Park Basis of Design Report
2	Arrowhead Mobile Home Park 100% Plans and Specifications

These are transmitted:

☒ For your approval ☐ For your use

☐ As requested ☒ For review and comment

Remarks

ELEMENT ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

TRANSMITTAL FORM

To:	El Paso County Administrator	Date:	June 15, 2018
	200 S. Cascade Ave., Suite 100	Re:	Arrowhead Mobile Home Park 22.7 Site Application
	Colorado Springs, CO 80903-2202	Job No.:	00013.0001
Attn:		From:	Nicholaus P. Marcotte, P.E.
		Phone:	(303) 378-2969

Via:

☐ Mail ☐ Fax ☐ FedEx ☒ Courier ☐ Other

Item List:

Copies	Description
1	Arrowhead Mobile Home Park 22.7 Site Application

These are transmitted:

☐ For your approval ☐ For your use

☐ As requested ☒ For review and comment

Remarks
CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the county for review and comment. After reviewing please forward comments, if any, by email at nmarcotte@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

ELEMENT ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

TRANSMITTAL FORM

To:	El Paso County Dept. of Public Health	Date:	June 15, 2018
	1675 W. Garden of the Gods Rd. #2044	Re:	Arrowhead Mobile Home Park 22.7 Site Application
	Colorado Springs, CO 80907-2202	Job No.:	00013.0001
Attn:		From:	Nicholaus P. Marcotte, P.E.
		Phone:	(303) 378-2969

Via:

☐ Mail ☐ Fax ☐ FedEx ☒ Courier ☐ Other

Item List:

Copies	Description
1	Arrowhead Mobile Home Park 22.7 Site Application

These are transmitted:

☐ For your approval ☐ For your use

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CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the county for review and comment. After reviewing please forward comments, if any, by email at nmarcotte@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

ELEMENT ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

TRANSMITTAL FORM

To:	Pikes Peak Area Council of Governments	Date:	June 15, 2018
	15 South 7th Street	Re:	Arrowhead Mobile Home Park
	Colorado Springs, CO 80905	Job No.:	00013.0001
Attn:	Water Quality Management Committee	From:	Nicholaus P. Marcotte, P.E.
		Phone:	(303) 378-2969

Via:

☐ Mail ☐ Fax ☐ FedEx ☒ Courier ☐ Other

Item List:

Copies	Description
1	Arrowhead Mobile Home Park 22.7 Site Application

These are transmitted:

☐ For your approval ☐ For your use

☐ As requested ☒ For review and comment

Remarks
CDPHE Regulation 22 requires that a copy of the attached 22.7 site application be provided to the local council of government for review and comment. After reviewing please forward comments, if any, by email at nmarcotte@elementengineering.net. If you have no comments please sign at the indicated location on the attached form and email a scan of the form to the listed email address.

ATTACHMENT – CONSTRUCTION PLANS

CONSTRUCTION PLANS

ARROWHEAD MOBILE HOME PARK
LIFT STATION

SECTION 15, TOWNSHIP 14 SOUTH, RANGE 64 WEST OF THE SIXTH P.M.

PREPARED FOR:

ARROWHEAD MOBILE HOME PARK
DAYTON AND LEAH ORSBURN, CO-TRUSTEES
909.576.1324
P.O. BOX 154
CHINO HILLS, CA 91709

EMERGENCY CONTACT: RHONDA FOLDEN, PARK MANAGER
719.683.2727

ENGINEERING

ELEMENT ENGINEERING, LLC
NICHOLAUS P. MARCOTTE, P.E. #47164
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165

VICINITY MAP
NOT TO SCALE

AREA MAP
NOT TO SCALE

SHEET INDEX:

CIVIL

C1	COVER SHEET
C2	GENERAL NOTES
C3	EXISTING CONDITIONS
C4	SITE PLAN
C5	LIFT STATION DETAILS
C6	DETAILS

NOTE:
THESE PLANS ARE CONCEPT IN NATURE AND PREPARED IN SUPPORT OF A BASIS OF DESIGN REPORT SUBMITTAL.

ELEMENT ENGINEERING LLC
12687 W. CEDAR DRIVE, SUITE 300
LAKEWOOD, CO 80228
720.749.4165
WWW.ELEMENTENGINEERING.NET

REVISIONS

NO.	DESCRIPTION	DATE	BY
1	100% PLANS	05/18	NPM

LIFT STATION - CONSOLIDATION

COVER SHEET

ARROWHEAD MOBILE HOME PARK
7575 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
NTS

DRAWING NAME
COVER

SHEET
C1 OF C6

GENERAL NOTES (ALL CONSTRUCTION):

1. ALL MATERIALS AND WORKMANSHIP SHALL BE IN CONFORMANCE WITH THE LATEST STANDARDS AND SPECIFICATIONS AS APPLICABLE WITH EL PASO COUNTY, COLORADO STANDARDS AND SPECIFICATIONS AS APPLICABLE. THE CONTRACTOR SHALL HAVE IN HIS POSSESSION AT ALL TIMES ONE (1) SIGNED COPY OF THE PLANS, SPECIFICATIONS, AND THE MOST CURRENT COPY OF THE SPECIFICATIONS AND REGULATIONS AS APPROVED BY THE APPROPRIATE GOVERNING AGENCY. THE CONTRACTOR SHALL OBTAIN WRITTEN APPROVAL FOR ANY VARIANCE TO THE ABOVE MENTIONED DOCUMENTS.

2. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE PARK OF ANY PROBLEM IN CONFORMING TO THE APPROVED PLANS FOR ANY ELEMENT OF THE PROPOSED IMPROVEMENTS PRIOR TO ITS CONSTRUCTION.

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE APPROPRIATE GOVERNING AGENCIES AT LEAST 48 HOURS PRIOR TO START OF ANY CONSTRUCTION. IF WORK IS SUSPENDED FOR ANY PERIOD OF TIME AFTER INITIAL START-UP, THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE GOVERNMENT AGENCIES 48 HOURS PRIOR TO RESTART.

4. THE CONTRACTOR SHALL NOTIFY ALL PUBLIC UTILITY COMPANIES AND DETERMINE THE LOCATION OF ALL EXISTING UNDERGROUND UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION. ALL WORK PERFORMED IN THE AREA OF PUBLIC UTILITIES SHALL BE PERFORMED ACCORDING TO THE REQUIREMENTS OF THESE AGENCIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ANY EXISTING UTILITY (INCLUDING DEPTH) WHICH MAY CONFLICT WITH THE PROPOSED CONSTRUCTION. THE CONTRACTOR SHALL PROTECT, AT HIS OWN EXPENSE, ALL EXISTING UTILITIES AND BE RESPONSIBLE FOR THEIR REPAIR IF THEY ARE DAMAGED DURING CONSTRUCTION.

   ALL KNOWN EXISTING UTILITIES ARE SHOWN IN APPROXIMATE LOCATIONS ON THE PLANS. THE ACTUAL LOCATION MAY VARY FROM THE PLANS, ESPECIALLY IN THE CASE OF UNDERGROUND UTILITIES. WHENEVER THE CONTRACTOR DISCOVERS A DISCREPANCY IN LOCATIONS, HE SHALL CONTACT THE PARK AND THE GOVERNING AUTHORITY IMMEDIATELY.

5. PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL OBTAIN ANY WRITTEN AGREEMENTS FOR INGRESS AND EGRESS TO THE WORK FROM ADJACENT PRIVATE PROPERTY WHICH SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.

6. THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PROVIDE THE FOLLOWING, BUT NOT LIMITED TO, ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

7. ALL EXCAVATIONS SHALL MEET CURRENT OSHA GUIDELINES.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REMOVAL AND REPLACEMENT OF ALL MATERIALS DISTURBED WITHIN DEDICATED RIGHTS-OF-WAYS AND ALL MATERIALS AND WORKMANSHIP SHALL MEET THE CONSTRUCTION STANDARDS OF THE PARK, AS APPLICABLE.

9. THE CONTRACTOR WILL BE HELD RESPONSIBLE FOR THE PROPER FUNCTIONING OF THE IMPROVEMENTS FOR A MINIMUM OF TWO (2) YEARS FROM THE DATE OF INITIAL ACCEPTANCE OF THE IMPROVEMENTS BY ARROWHEAD MOBILE HOME PARK. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIED BY THE CONTRACTOR TO THE SATISFACTION OF THE PARK AND AT NO EXPENSE TO ANY OF THE AGENCIES.

10. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY ARROWHEAD MOBILE HOME PARK. THE PARK RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO ITS STANDARDS AND SPECIFICATIONS.

11. THE CONTRACTOR SHALL NOTIFY THE PARK OWNERS A MINIMUM OF 48 HOURS AND A MAXIMUM OF 96 HOURS PRIOR TO STARTING CONSTRUCTION.

12. ACCESS MUST BE MAINTAINED FOR ALL EMERGENCY VEHICLES, BUSINESSES, CITIZENS AND DELIVERIES AT ALL TIMES DURING CONSTRUCTION.

13. NO PAVING OR CONCRETE WORK OF ANY KIND SHALL START UNTIL ALL SUBGRADE COMPACTION TESTS ARE TAKEN AND ACCEPTED AND A PROOFROLL IS PERFORMED AND ALL AREAS PASS BY THE PARK.

14. ALL SUBGRADE MATERIAL SHALL BE COMPACTED TO A MINIMUM OF 95% OF THE MAXIMUM STANDARD PROCTOR DENSITY PER ASTM D-698 AT A MOISTURE CONTENT PER THE RECOMMENDATION OF THE TESTING AGENCY.

15. THE CONTRACTOR IS RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION AND SEDIMENT CONTROL MEASURES AT ALL TIMES DURING CONSTRUCTION.

16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING ALL DISTURBED SURFACES AND RELATED STRUCTURES, INCLUDING, BUT NOT LIMITED TO, DRIVEWAYS, CURBS, GUTTERS, WALKS, GRASS AREAS AND BITUMINOUS PAVEMENTS TO ORIGINAL CONDITIONS (OR BETTER). THE PARK AND THE CONTRACTOR SHALL COORDINATE THE DOCUMENTATION OF EXISTING GRADES, CONDITIONS, AND OTHER INFORMATION PRIOR TO ALL CONSTRUCTION ACTIVITIES. SITE RESTORATION SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND WILL NOT BE PAID FOR SEPARATELY, UNLESS OTHERWISE PROVIDED FOR IN THE BID SCHEDULE.

17. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY FIELD CONDITION NOT CONSISTENT WITH THE DRAWINGS OR CONTRACT DOCUMENTS.

18. THE CONTRACTOR IS RESPONSIBLE FOR SAVING AND PROTECTING ALL EXISTING TREES AND VEGETATION WHERE REMOVAL FOR CONSTRUCTION IS NOT MANDATORY. ALL TREES TO BE REMOVED OR RELOCATED WILL BE MARKED BY THE PARK PRIOR TO REMOVAL.

19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCEPTANCE AND CONTROL OF ALL FLOWS INCLUDING STORM FLOWS IN AND ENTERING THE WORK AREA, OFF-SITE DRAINAGE FLOWS, AND GROUNDWATER FLOWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGE TO STRUCTURES, LOSS OF TOPSOIL, AND LOSS OF SEED CAUSED BY FLOWS UNTIL THE PROJECT IS ACCEPTED BY THE PARK. ALL WORK SHALL BE COMPLETED IN DRY CONDITIONS.

20. THE CONTRACTOR SHALL BE RESPONSIBLE TO CLEAN UP ANY TRASH OR MUD ON THE SITE OR ADJACENT STREETS AS A RESULT OF CONSTRUCTION. ALSO, THE CONTROL OF DUST DUE TO CONSTRUCTION ACTIVITIES IS MANDATORY.

21. THE CONTRACTOR SHALL PROVIDE TRAFFIC CONTROL AS REQUIRED BY THE PARK. THE CONTRACTOR SHALL PROVIDE A TRAFFIC CONTROL PLAN TO THE PARK FOR REVIEW PRIOR TO CONSTRUCTION AND SHALL OBTAIN ANY NECESSARY PERMITS AND APPROVALS FROM THE PARK AS REQUIRED PRIOR TO CONSTRUCTION.

SANITARY SEWER NOTES:

1. ALL DIRECT BURY SEWER MAINS SHALL BE PVC.

2. SEWER LINES SHALL BE 10 FEET FROM WATER LINES EXCEPT WHEN CROSSING EACH OTHER. FOR SEWER LINES WHICH CROSS LESS THAN 1 ½ FEET VERTICALLY FROM WATER LINES, THE CLOSEST SANITARY SEWER JOINT SHALL BE A MINIMUM OF 6 FEET FROM THE CROSSING.

3. ALL MANHOLES SHALL BE WATER TIGHT PRECAST CONCRETE, A MINIMUM OF 48 INCH IN DIAMETER WITH ECCENTRIC CONE, 24 INCH CAST IRON RING (8" DEPTH) AND COVER, UNLESS OTHERWISE SPECIFIED. CONCRETE ADJUSTMENT RINGS SHALL BE USED FOR ADJUSTMENT TO MATCH FINAL PAVEMENT ELEVATIONS AND SET IN MASTIC TO OBTAIN A WATER TIGHT SEAL. CONCRETE ADJUSTMENT RINGS SHALL BE 4" MINIMUM IN DEPTH TO ELIMINATE MULTIPLE JOINTS.

4. SEWER RIM ELEVATIONS SHOWN ARE APPROXIMATE ONLY AND ARE NOT TO BE TAKEN AS FINAL ELEVATIONS.

5. THE CONTRACTOR TO VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL TIE IN POINTS PRIOR TO CONSTRUCTION AND PROVIDE THE DATA TO THE ENGINEER PRIOR TO CONSTRUCTION.

6. PIPE BEDDING SHALL BE CLASS "B" AND SHALL CONFORM TO ASTM C-33 OR D-448 GRADATION NO. 6 OR NO. 67. SQUEEGEE BEDDING IS PREFERRED. BEDDING DEPTH SHALL BE 6" UNDER AND AROUND THE SIDES OF THE PIPE AND 12" OVER THE PIPE. CONSOLIDATION IN PIPE ZONE SHALL BE BY HAND TAMPING.

7. AT LEAST 5 DAYS PRIOR TO THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING WILL BE HELD AT THE PARK'S OFFICE AND ATTENDED BY THE CONTRACTOR AND REPRESENTATIVES OF THE OTHER APPROVING AGENCIES. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE PARK ENGINEER TO SCHEDULE THIS MEETING.

8. THE CONTRACTOR WILL IDENTIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL REPORT ANY DISCREPANCIES TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION.

9. THE CONTRACTOR SHALL HAVE IN THEIR POSSESSION AT ALL TIMES ONE SIGNED COPY OF PLANS APPROVED BY THE PARK AND THE PARK'S ENGINEER. THESE PLANS WILL ALSO INCLUDE ALL ADDENDUMS OR REVISIONS WHICH HAVE BEEN REVIEWED AND APPROVED BY THE PARK AND THE PARK ENGINEER.

10. ALL MANHOLES SHALL HAVE SHAPED INVERTS.

11. ALL FORCE MAINS SHALL BE TESTED PRIOR TO INITIAL ACCEPTANCE OR ANY CONNECTION.

12. ALUMINUM FOIL WARNING TAPE SHALL BE USED FOR ALL NEW DIRECT BURY SEWER MAINS. THE TAPE WILL BE INSTALLED 2' BELOW FINISHED GRADE. TAPE MUST BE GREEN IN COLOR.

13. ALL BARREL SECTIONS OF MANHOLES SHALL BE GROUTED INSIDE AT JOINTS.

14. IF SEWAGE BYPASS PUMPING IS NECESSARY, THE CONTRACTOR WILL SUPPLY AND MONITOR THE PUMP DURING THE ENTIRE PUMPING PERIOD. A BACK-UP PUMP WILL BE ONSITE FOR USE IF NECESSARY. BYPASS HOSE SHALL BE PROTECTED FROM TRAFFIC DAMAGE USING APPROVED APPARATUS. FOR ALL SEWAGE BYPASS PUMPING. THE CONTRACTOR WILL HAVE CONTINUOUS ON SITE MONITORING OF PUMPING OPERATIONS.

15. SHOULD TRENCH DEWATERING BECOME NECESSARY, THE CONTRACTOR WILL OBTAIN ALL REQUIRED PERMITS AND SUPPLY THE PUMPS REQUIRED AT NO ADDITIONAL COST TO THE OWNER.

16. ALL MANHOLE AND SANITARY SEWER MAIN TESTING SHALL BE WITNESSED BY A REPRESENTATIVE OF THE PARK. A MINIMUM OF 24 HOURS ADVANCED NOTICE IS REQUIRED PRIOR TO TESTING.

17. ALL MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12-INCH WIDE CONSEAL CS 212 OR APPROVED EQUIVALENT.

TESTING AND INSPECTION NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT ALL REQUIRED OR NECESSARY INSPECTIONS ARE COMPLETED BY AUTHORIZED INSPECTORS PRIOR TO PROCEEDING WITH THE SUBSEQUENT WORK WHICH COVERS OR THAT IS DEPENDENT ON THE WORK TO BE INSPECTED. FAILURE TO OBTAIN NECESSARY INSPECTION(S) AND APPROVAL(S) SHALL RESULT IN THE CONTRACTOR BEING FULLY RESPONSIBLE FOR ANY ISSUES ARISING FROM UN-INSPECTED WORK.

2. CONTRACTOR TO SIMULATE PERMITTED HYDRAULIC FLOW FOR MINIMUM OF SIX (6) HOURS AND MINIMUM FLOW FOR (6) HOURS TO FILTER LIFT STATION AND FILTER DURING TESTING.

ABBREVIATIONS

ARVB	AIR RELIEF VACUMBREAKER VALVE	MH	MANHOLE
BEG	BELOW EXISTING GRADE	N	NORTH
BFV	BUTTERFLY VALVE	NE	NORTHEAST
℄	CENTERLINE	NW	NORTHWEST
CMP	CORRUGATED METAL PIPE	OH	OVERHEAD
DIA. OR ø	DIAMETER	PVC	POLYVINYL CHLORIDE
E	EAST	RAD OR R	RADIUS
EA	EACH	RPP	REINFORCED POLYPROPYLENE
ELEC	ELECTRICAL LINE	S	SOUTH
EOA	EDGE OF ASPHALT	SE	SOUTHEAST
EXIST. OR EX.	EXISTING	SW	SOUTHWEST
INV	INVERT	T.O.P.	TOP OF PIPE
L.P.	LOW POINT	UON	UNLESS OTHERWISE NOTED
FM	FORCE MAIN		

CIVIL/ARCHITECTURAL/PROCESS SYMBOLS LIBRARY

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REVISIONS

NO.	DESCRIPTION	DATE	BY
1	100% PLANS	05/18	NPM

LIFT STATION - CONSOLIDATION

GENERAL NOTES

ARROWHEAD MOBILE HOME PARK
375 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
NTS

DRAWING NAME
NOTES

SHEET
C2 OF C6

LEGEND

- FOUND SECTION CORNER AS NOTED
- FOUND PROPERTY CORNER AS NOTED
- SET CONTROL POINT AS NOTED
- UTILITY POLE
- GUY WIRE
- ELECTRIC TRANSFORMER
- TELEPHONE PEDESTAL
- CLEAN-OUT
- UNDERGROUND GAS SIGN
- (R) RECORD BEARING AND DISTANCE
- (M) MEASURED BEARING AND DISTANCE
- OHE — OVERHEAD UTILITY LINE
- UT — UNDERGROUND TETEPHONE LINE
- [-] [-] — BARB WIRE FENCE
- X X — WOOD FENCE
- CONCRETE SURFACE
- ASPHALT SURFACE

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LIFT STATION - CONSOLIDATION

EXISTING CONDITIONS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
AS SHOWN

DRAWING NAME
EXIST

SHEET
C3 OF C6

NOTES:

1. FORCE MAIN IS SLOPED AT A CONSTANT GRADE UP TO TIE-IN LOCATION TO AVOID LOCALIZED HIGH SPOTS.
2. CONTRACTOR TO CONFIRM LOCATIONS AND ELEVATIONS OF ALL TIE-IN LOCATIONS PRIOR TO CONSTRUCTION.
3. CONTRACTOR MAY SUBSTITUTE SCH 80 PVC WITH HDPE FOR FORCE MAIN.
4. CONTRACTOR RESPONSIBLE FOR ALL PERMITS INCLUDING ROAD CUT. CONTRACTOR TO SUPPLY REQUIRED TRAFFIC CONTROL.
5. EXISTING UTILITIES TO BE PROTECTED. LOCATION SHOWN MAY NOT BE ACCURATE.
6. CONTROLS AND ELECTRICAL BY OTHERS.
7. FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS FOR INSTALL AND STARTUP.

DETAIL 1: SCALE 1" = 5'

DETAIL 2: SCALE 1" = 10'

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LIFT STATION - CONSOLIDATION

SITE PLAN

ARROWHEAD MOBILE HOME PARK
2575 ARPEL DRIVE, ROAD 5
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF
ELEMENT ENGINEERING, LLC

DATE
JUNE 2018

JOB NUMBER
0013.0001

SCALE
AS SHOWN

DRAWING NAME
SITE

SHEET
C4 OF C6

C / C5 C5 — WET WELL PROFILE VIEW
1" = 1'

A / C5 C5 — WET WELL ACCESS PLAN VIEW
1" = 1'

B / C5 C5 — WET WELL PLAN VIEW
1" = 1'

NOTES:
1. LIFT STATION SHALL BE EQUIPPED WITH AUTO DIALER TO ALARM STAFF OF LIFT STATION ALARM CONDITIONS. CONTRACTOR RESPONSIBLE FOR AUTO DIALER CONNECTION
2. LIFT STATION PANEL SHALL BE EQUIPPED WITH TRANSFER SWITCH TO CONNECT TO A PORTABLE GENERATOR
3. PEAK HOUR FLOW INTO LIFT STATION = 20.8 GPM
4. DESIGN PUMPING FLOW = 35 GPM
5. DESIGN POINT SHALL BE ACHIEVED USING VARIABLE FREQUENCY DRIVE (TDH = 54.8 FT) OR CREATION OF ARTIFICIAL HEAD BY PARTIALLY CLOSED VALVE (TDH = 76 FT)

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1	100% PLANS	05/18	NPW

LIFT STATION - CONSOLIDATION

LIFT STATION DETAILS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: JUNE 2018
JOB NUMBER: 0013.0001
SCALE: 1" = 1'
DRAWING NAME: LS DETAIL
SHEET: C5 OF C6

MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"–36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"–48"

NOTE:
MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212.

SANITARY SEWER MANHOLE (CIP BASE)

Scale: *NONE*	Date: *SEPTEMBER 2015*
Revised:	Detail: *SS–4*

MANHOLE ID:
ID = 4' FOR SEWER MAIN DIAMETERS < 15"
ID = 5' FOR SEWER MAIN DIAMETERS 15"–36"
ID = 6' FOR SEWER MAIN DIAMETERS 42"–48"

NOTE: MANHOLE/VAULT EXTERIOR JOINTS SHALL BE WRAPPED IN 12" WIDE CONSEAL JOINT WRAP CS 212. ALL INTERIOR JOINTS AND RISER RINGS MUST BE GROUTED.

SANITARY SEWER MANHOLE (PRECAST BASE)

Scale: *NONE*	Date: *SEPTEMBER 2015*
Revised:	Detail: *SS–5*

NOTE:MANHOLE/VAULT BARREL SECTIONS WILL REQUIRE AN EXTERIOR COATING OF TNEMEC SERIES 46–465 OR APPROVED EQUIVALENT IF GROUNDWATER IS ENCOUNTERED IN THE TRENCH.

TYPICAL MH BASE CHANNELIZATION

Scale: *NONE*	Date:
Revised:	Detail:

TABLE IV MIN. DEPTH OF BEDDING MAT'L. BELOW BOTTOM OF PIPE			
PIPE SIZE–D*	d_1	d_2	d_3
18" & SMALLER	4"	6"	6"
21" TO 36"	6"	6"	6"
42" TO 60"	6"	6"	6"
66" TO 96"	8"	9"	9"
104" & LARGER	12"	12"	12"

B_d=SPECIFIED TRENCH WIDTH AT A POINT 12" ABOVE CROWN (MAX. ALLOWANCE)
B_c=PIPE O.D.
D =PIPE I.D.
d_1, d_2, d_3=DEPTH OF BEDDING MATERIAL BELOW BOTTOM OF PIPE.

NOTES:
3.1 BELL HOLES SHALL BE EXCAVATED AT ALL BELL AND SPIGOT JOINTS.
3.2 BEDDING TRENCH BACKFILL TO BE COMPACTED TO 90% DENSITY, AASHTO T–180 IN OPEN AREAS AND 95% DENSITY AASHTO T–99 IN ALL PUBLIC R.O.W.

IDEAL TRENCH CONDITIONS
15" DIA. & SMALLER
N.T.S.

CLASS "B" BEDDING MATERIAL SHALL CONSIST OF A WELL GRADED MIXTURE OF MINERAL AGGREGATE. THE AGGREGATE SHALL BE SQUEEGEE WITH A MAXIMUM AMOUNT OF FINES PASSING A NO. 200 SCREEN NOT TO EXCEED 5% BY WEIGHT. THE AGGREGATE SHALL COMPLY WITH ASTM C–33 OR ASTM D–448, GRADATION #6 OR #67. IF THE EXCAVATION FOR BEDDING IS BELOW THE WATER TABLE, THE SUB–BEDDING MATERIAL SHALL CONSIST OF 3/4–INCH TO 1–1/2–INCH CRUSHED ROCK.

SANITARY SEWER PIPE BEDDING DETAIL

MANHOLE WALL PENETRATION DETAIL

NOTES:

1. FOR FIELD CORED PENETRATIONS, LEAK SEAL IS REQUIRED.

NOTES:

1. ON 16" AND 20" TRANSMISSION MAINS, ALL BENDS SHALL BE BOTH RODDED AND KICKBLOCKED.
2. BEARING SURFACES SHOWN IN CHART ARE MIN.
3. BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER.
   4", 6", 8" AND 12" WATER HAMMER = 110 PSI
   16", 20" AND 24" WATER HAMMER = 70 PSI
4. BASED ON 3,000 PSF SOIL BEARING CAPACITY.
5. ALL VALVES, TEES, BENDS AND PLUGS SHALL BE BOTH RODDED AND KICKBLOCKED.

MINIMUM BEARING SURFACE AREA
(IN SQUARE FEET)

SIZE OF PIPE	BENDS				TEE OR DEAD END
	11 1/4°	22 1/2°	45°	90°	
4"	1.00	1.00	1.00	N/A	1.50
6"	1.00	1.25	2.25	N/A	3.00
8"	1.00	2.00	4.00	N/A	5.25
12"	2.25	4.50	8.75	N/A	11.25
16"	3.75	7.50	14.50	27.00	19.00
20"	5.00	10.00	19.50	35.50	25.00
24"	7.00	14.00	27.75	51.00	36.00

CONCRETE KICKBLOCKS BEARING SURFACES & INSTALLATION

METER VAULT DETAIL

NOTES:

1. OPTIONAL PROVIDE FLANGED SPOOL TO MATCH METER DIMENSIONS TO ALLOW REMOVAL OF FLOW METER.
2. DIMENSIONS SHOWN ARE REQUIRED UPSTREAM AND DOWNSTREAM DIAMETERS OF STRAIGHT PIPE.
3. DETAIL FOR SCHEMATIC PURPOSES ONLY, CONFIRM DIMENSIONS AND FITTINGS AS NECESSARY.
4. INSTALL METER PER MANUFACTURER'S REQUIREMENTS.
5. FLOW METER 18" MIN ABOVE MANHOLE FLOOR.

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1.	100% PLANS	05/18	NPW

LIFT STATION – CONSOLIDATION

DETAILS

ARROWHEAD MOBILE HOME PARK
75 NORTH CURTIS ROAD
COLORADO SPRINGS, CO 80930

PREPARED UNDER THE DIRECT SUPERVISION OF

FOR AND ON BEHALF OF ELEMENT ENGINEERING, LLC

DATE: JUNE 2018
JOB NUMBER: 0013.0001
SCALE: 1" = 1'
DRAWING NAME: DETAILS
SHEET: C6 OF C6

EXHIBIT J – LAND USE MAP

Zone Map 441

- El Paso County -
Development Services Department

Zoning Designations

- RS-20000: Residential Suburban (20,000 sq. ft.)
- RS-6000: Residential Suburban (6,000 sq. ft.)
- RS-5000: Residential Suburban (5,000 sq. ft.)
- RM-12: Residential Multi-Dwelling (12 DU/acre)
- RM-30: Residential Multi-Dwelling (30 DU/acre)
- RR-0.5: Residential Rural (0.5 acres)
- RR-2.5: Residential Rural (2.5 acres)
- RR-5: Residential Rural (5 acres)
- R-T: Residential - Topographic
- MHP: Mobile Home Park
- MHP-R: Mobile Home Park, Rural
- MHS: Mobile Home Subdivision
- RVP: Recreational Vehicle Park
- F-5: Forest & Recreation (5 acres)
- PUD: Planned Unit Development
- CC: Commercial Community
- CR: Commercial Regional
- CS: Commercial Service
- I-2: Limited Industrial
- I-3: Heavy Industrial
- A-5: Agricultural (5 acres)
- A-35: Agricultural (35 acres)
- C-1: ** Commercial
- C-2: ** Commercial
- M: ** Industrial
- R-4: ** Planned Development

** Indicates an obsolete designation

Supporting Data

- Highways
- Major Roadways
- Creeks - Perennial
- Creeks - Intermittent
- R Section Corner Nodes
- Sections
- Parcels
- Military
- Pike National Forest
- Incorporated Cities
- Zone Map Boundary
- Zoning Overlay
- Special Uses

N W E S

1,600 800 0 1,600 Feet

1 inch = 1,600 feet

January 31, 2017

Vicinity Map

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EXHIBIT K – SCHOOL DISTRICT MAP
FIRE DISTRICT MAP

Map 7.1
School Districts

Highway 94 Comprehensive Plan
El Paso County, Colorado

LEGEND

SCHOOL DISTRICTS

- Academy School District 20
- Calhan School District RJ1
- Colorado Springs School District 11
- Ellicott School District 22
- Falcon School District 49
- Fountain/Ft. Carson School District 8
- Hanover School District 28
- Harrison School District 2
- Peyton School District 23
- Widefield School District 3

SCHOOL LOCATIONS

- Elementary Schools
- Jr. High/Middle Schools
- High Schools
- School District Administration
- Fountain Valley School (Private)

- Fountain Valley School Boundary
- City of Colorado Springs
- City of Fountain
- Military Installations
- Planning Boundary

SCALE IN MILES

0 1 2 3

N

Prepared by: El Paso County Planning Department
Print Date: December 10, 2003

Map 7.2
Emergency Services

Highway 94 Comprehensive Plan
El Paso County, Colorado

LEGEND

FIRE PROTECTION DISTRICTS
- Black Forest
- Calhan
- Cimarron Hills
- Ellicott
- Falcon
- Hanover
- Peyton
- Security

MUNICIPALITY FIRE DEPARTMENTS
- City of Colorado Springs
- City of Fountain

OTHER FIRE PROTECTION
- No Structural Fire Protection

EMERGENCY SERVICES
- Medical Services
- Transportation Services
- Fire Services
- City of Colorado Springs
- City of Fountain
- Military Installations
- Planning Boundary

SCALE IN MILES
0 1 2 3

Prepared by: El Paso County Planning Department
Print Date: December 10, 2003

EXHIBIT L – NRCS SOILS MAP

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

El Paso County Area, Colorado

April 25, 2018

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

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105—Vona sandy loam, warm, 3 to 6 percent slopes.....14
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How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Soil Map

Map Scale: 1:2,680 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: El Paso County Area, Colorado
Survey Area Data: Version 15, Oct 10, 2017

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: May 22, 2016—Mar 9, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2	Ascalon sandy loam, 1 to 3 percent slopes	31.4	94.3%
105	Vona sandy loam, warm, 3 to 6 percent slopes	1.9	5.7%
Totals for Area of Interest		**33.3**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

El Paso County Area, Colorado

2—Ascalon sandy loam, 1 to 3 percent slopes

Map Unit Setting

National map unit symbol: 367q
Elevation: 5,500 to 6,500 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 47 to 50 degrees F
Frost-free period: 130 to 150 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Ascalon and similar soils: 85 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Ascalon

Setting

Landform: Flats
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Mixed alluvium and/or eolian deposits

Typical profile

A - 0 to 8 inches: sandy loam
Bt - 8 to 21 inches: sandy clay loam
BC - 21 to 27 inches: sandy loam
Ck1 - 27 to 48 inches: sandy loam
Ck2 - 48 to 60 inches: loamy sand

Properties and qualities

Slope: 1 to 3 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 10 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water storage in profile: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: B
Ecological site: Sandy Plains LRU's A & B (R069XY026CO)
Other vegetative classification: SANDY PLAINS (069BY026CO)
Hydric soil rating: No

Minor Components

Other soils

Percent of map unit:
Hydric soil rating: No

Pleasant

Percent of map unit:
Landform: Depressions
Hydric soil rating: Yes

105—Vona sandy loam, warm, 3 to 6 percent slopes

Map Unit Setting

National map unit symbol: 2t517
Elevation: 3,400 to 6,000 feet
Mean annual precipitation: 14 to 16 inches
Mean annual air temperature: 48 to 54 degrees F
Frost-free period: 130 to 170 days
Farmland classification: Not prime farmland

Map Unit Composition

Vona, warm, and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Vona, Warm

Setting

Landform: Sand sheets
Landform position (two-dimensional): Backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Eolian sands

Typical profile

A - 0 to 5 inches: sandy loam
Bt1 - 5 to 12 inches: sandy loam
Bt2 - 12 to 17 inches: sandy loam
Bk - 17 to 41 inches: sandy loam
BCk - 41 to 79 inches: loamy sand

Properties and qualities

Slope: 3 to 6 percent
Depth to restrictive feature: More than 80 inches
Natural drainage class: Somewhat excessively drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum in profile: 15 percent
Gypsum, maximum in profile: 2 percent
Salinity, maximum in profile: Nonsaline to very slightly saline (0.0 to 3.9 mmhos/cm)
Sodium adsorption ratio, maximum in profile: 2.0
Available water storage in profile: Moderate (about 7.2 inches)

Interpretive groups

Land capability classification (irrigated): 4e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Ecological site: Sandy Plains (R067BY024CO)
Forage suitability group: Loamy, Dry (G067BW019CO)
Other vegetative classification: Sandy Plains #24 (067XY024CO_2)
Hydric soil rating: No

Minor Components

Olnest, warm

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Summit, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Plains (R067BY024CO)
Hydric soil rating: No

Valent, warm

Percent of map unit: 5 percent
Landform: Sand sheets
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Crest, side slope
Down-slope shape: Convex
Across-slope shape: Convex
Ecological site: Deep Sand (R067BY015CO)
Other vegetative classification: Deep Sands #15 (067XY015CO_3)
Hydric soil rating: No

Otero, warm

Percent of map unit: 5 percent
Landform: Hillslopes
Landform position (two-dimensional): Shoulder, backslope
Landform position (three-dimensional): Side slope, head slope
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: Sandy Plains (R067BY024CO)
Other vegetative classification: SANDY PLAINS (067XY024CO_1)
Hydric soil rating: No

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EXHIBIT M – DRAINAGE ANALYSIS

ELEMENT ENGINEERING LLC
DILIGENT • INNOVATIVE • RESPONSIVE

MEMORANDUM

TO: El Paso County

FROM: Element Engineering

DATE: October 4, 2018

SUBJECT: Arrowhead Mobile Home Park – Grading and Drainage

PURPOSE:

The purpose of this memorandum is to briefly provide background on the grading and drainage items necessary for the design and construction of the proposed AMHP lift station.

GRADING AND DRAINAGE

Excavation will be limited to a small area (approximately 10-ft x 10-ft) for the installation of the lift station. A trench with a width of less than three-ft will be excavated for the installation of the force main. No grading or drainage changes are proposed as a part of this project and existing drainage patterns will not be impacted. All excavated areas will be replaced at their current elevation and disturbed areas will either be re-seeded or re-paved (as applicable). Furthermore, no additional impermeable or semi-permeable area will be added or modified as a part of this project. Therefore, no grading or drainage analysis is necessary for this project.

BEST MANAGEMENT PRACTICES (EROSION CONTROL)

Erosion control layout and details have been provided in the updated plan set. Erosion control measures will be installed to prevent sediment from being carried away from the excavation area and excessive erosion from occurring.

EXHIBIT N – GEOTECHNICAL EVALUATION

Kumar & Associates, Inc.
Geotechnical and Materials Engineers
and Environmental Scientists

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GEOTECHNICAL ENGINEERING STUDY
PROPOSED LIFT STATION AND FORCE MAIN
ARROWHEAD MOBILE HOME PARK
75 N. CURTIS ROAD
COLORADO SPRINGS, COLORADO

Prepared By:
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Attn: Mr. Nicholas P. Marcotte, P.E.

Project No. 18-2-174

June 29, 2018

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FIG. 1 – LOCATION OF EXPLORATORY BORINGS
FIG. 2 – LOGS OF EXPLORATORY BORING
FIG. 2 – LEGEND AND NOTES
FIG. 3 – SWELL – CONSOLIDATION TEST RESULTS

TABLE I - SUMMARY OF LABORATORY TEST RESULTS

SUMMARY

1. In the boring, beneath a thin layer of topsoil, sandy lean clay was encountered and extended to an approximate depth of 12 feet. Clayey sands were found beneath the clay, and extended to the 30-foot depth explored.

2. Groundwater was not encountered in the boring at the time of drilling or when checked 5 days later. We anticipate that the depth to groundwater will fluctuate over time.

3. It is our opinion a shallow foundation bearing on a minimum of 1 foot of properly compacted structural fill will perform adequately for the desired application. Footings should be designed for a maximum allowable bearing pressure of 2,000 psf, and with the other design and construction considerations presented in this report.

PURPOSE AND SCOPE OF WORK

This report presents the results of a geotechnical engineering study for the proposed Arrowhead lift station and force main, to be located at 75 North Curtis Road in Colorado Springs, Colorado. The project site is shown on Fig. 1. This study was conducted in accordance with the scope of work in our Proposal No. C18-210 dated June 4, 2018, to develop recommendations for the proposed construction.

This report has been prepared to summarize the data obtained during this study and to present our conclusions and recommendations based on the proposed construction and the subsurface conditions encountered. Design parameters and a discussion of geotechnical engineering considerations related to the proposed construction are included in the report.

PROPOSED CONSTRUCTION

We understand the proposed construction will consist of a prefabricated fiberglass basin lift station and a new PVC force main. The fiberglass basin will extend approximately 8 to 10 feet below existing grade. Foundation loads are anticipated to be light, typical of the proposed construction type. Site grading is anticipated to be negligible outside of the lift station envelope. If the proposed construction varies significantly from that described above or depicted in this report, we should be notified to reevaluate the recommendations contained herein.

SITE CONDITIONS

The proposed building area is located at the existing Arrowhead mobile home park at 75 North Curtis Road in Colorado Springs, as shown on Fig. 1. The building area is at the existing wastewater treatment facility for the mobile home park and is bordered by mobile homes to the north and west, multi-acre residential lots are located to the south. A waste water impoundment

basin was located approximately 50 feet to the east of the boring and had a small amount of water present at the time of our study. Regional topography includes rolling hills, but the general area of the site was relatively flat, and was sparsely vegetated with natural grasses and weeds.

FIELD EXPLORATION

The field exploration of subsurface conditions consisted of drilling one boring at the approximate location shown on Fig. 1. The boring was drilled on June 15, 2018. The boring log and the corresponding legend and notes are included on Fig. 2.

The boring was drilled with 4-inch diameter continuous flight augers and was logged by a representative of Kumar & Associates, Inc. Samples of the overburden soils were taken with a 2-inch I.D. California sampler. The sampler was driven into the various strata with blows from a 140-pound hammer falling 30 inches. Penetration resistance values, when properly evaluated, provide an indication of the relative density or consistency of the soils. Depths at which the samples were taken and the penetration resistance values are shown on the boring logs, Fig. 2.

The boring was checked for groundwater at the time of drilling, and again 5 days later. The boring was then backfilled with the on-site soils.

LABORATORY TESTING

Samples obtained from the exploratory boring were visually classified in the laboratory by the project engineer and samples were selected for laboratory testing. Laboratory testing included index property tests such as in-situ moisture content and dry unit weight, grain size analysis, and Atterberg limits. Additional testing performed included concentration of water soluble sulfates. The testing was conducted in general accordance with recognized test procedures, primarily those of the American Society for Testing of Materials (ASTM). Results of the laboratory testing program are shown on Figs. 2 and 3, and are summarized on Table I.

SUBSURFACE CONDITIONS

In the boring, native sandy lean clay was encountered and extended to an approximate depth of 12 feet. Sampler penetration blow counts indicate the native clay soils were stiff. Swell consolidation tests performed on the sandy lean clays indicated a low swell to slight consolidation potential when based on a vertical expansion of 0.6 percent and a consolidation of 0.1 percent upon wetting.

Native soils consisting of clayey sand were encountered below the sandy lean clay, extending to the maximum 30-foot depth explored. Sampler penetration blow counts indicate that these soils are medium dense to dense.

Groundwater was not encountered in the boring at the time of drilling or when checked 5 days later. Fluctuations in the water level may occur with time.

FOUNDATION RECOMMENDATIONS

Considering the subsurface conditions encountered in the exploratory borings and the nature of the proposed construction, a shallow foundation bearing on a minimum of 1 foot of properly compacted structural fill should perform adequately for the desired application.

The design and construction criteria presented below should be observed for a spread footing foundation system. The construction details should be considered when preparing project documents.

1. Footings placed on properly compacted structural fill should be designed for an allowable bearing pressure of 2,000 psf. A modulus of subgrade reaction of 40 can be used for design of mat foundations.

2. Any areas of loose, soft or otherwise unsuitable material at the base of the excavation should be removed and replaced with a nonexpansive structural fill. New fill should extend down from the edges of the footings at a minimum 1 horizontal to 1 vertical projection.

3. The native clay soils are not suitable for reuse as structural fill. Import soils, if required, should consist of a minus 2-inch granular soil that contains a maximum 30 percent passing the No. 200 sieve, and a maximum plasticity index of 15.

4. Fill placed for support of foundations should be compacted to a minimum 98% of the standard Proctor maximum dry density (ASTM D 698), at a moisture content within 2 percent of optimum for granular soils.

5. We estimate total settlement for footings designed and constructed as discussed in this section will be approximately 1 inch or less.

6. Spread footings should have a minimum width of 16 inches for continuous footings and 24 inches for isolated pads.

7. Exterior footings should be provided with adequate soil cover above their bearing elevation for frost protection. Placement of foundations at least 30 inches below the exterior grade is typically used in this area.

8. Continuous foundation walls should be reinforced top and bottom to span an unsupported length of at least 10 feet.

9. The natural fine-grained soils may pump or deform excessively under heavy construction traffic. The use of track-mounted construction equipment and other equipment that exert lower contact pressures than pneumatic tires should be used, and the movement of vehicles over proposed foundation areas should be restricted to help reduce this difficulty.

10. A representative of the geotechnical engineer should observe all footing excavations prior to fill or concrete placement.

SEISMIC DESIGN CRITERIA

The generalized subsurface profile was assumed to consist of generally granular overburden soils, underlain by relatively deep sedimentary bedrock. The weighted average of the estimated shear wave velocities for this subsurface profile to a depth of 100 feet indicates an IBC design Site Class D. Based on the subsurface profile and site seismicity, liquefaction is not a design consideration.

LATERAL EARTH PRESSURES

Tank walls which are laterally supported and can be expected to undergo only a moderate amount of deflection should be designed for a lateral earth pressure computed on the basis of an equivalent fluid unit weight of 65 pcf for backfill consisting of the on-site soils, or 50 pcf if an imported CDOT Class I structural backfill is used.

The tank should be designed for appropriate hydrostatic and surcharge pressures such as adjacent buildings, traffic, construction materials and equipment. The pressures recommended above assume drained conditions behind the tank walls and a horizontal backfill surface. The

buildup of water behind a wall or an upward sloping backfill surface will increase the lateral pressure imposed on a foundation wall or retaining structure.

The lateral resistance of a foundation placed on properly compacted structural fill material will be a combination of the sliding resistance of the foundation on the foundation materials and passive earth pressure against the side of the footing. Resistance to sliding at the bottoms of the footings may be calculated based on an allowable coefficient of friction of 0.30. Passive pressure against the sides of the footings may be calculated using an allowable equivalent fluid unit weight of 160 pcf. Compaction of fill placed against the sides of the footings to resist lateral loads should be a nonexpansive material compacted to at least 95% of the standard Proctor (ASTM D 698) maximum dry density, at a moisture content within 2 percent of optimum for granular soils and 0 to +4 percent of optimum for cohesive soils.

The onsite soils are suitable for use as tank wall backfill assuming remolded swell consolidation tests are performed and the percent swell when remolded is less than 0.5 percent when wetted at 200 psf. Based on the soils sampled and laboratory tests performed, it is likely the onsite soils will meet this criteria. Imported granular wall back fill, if used, should meet the requirements of a CDOT Class I structural backfill with less than 20% passing the No. 200 sieve. Proposed material should be approved by the geotechnical engineer prior to use. Backfill should be placed in uniform lifts and compacted to the criteria presented in the paragraph above. Care should be taken not to overcompact the backfill since this could cause excessive lateral pressure on the tank.

WATER SOLUBLE SULFATES

The concentration of water soluble sulfates measured in samples obtained from the exploratory boring was approximately 0.02%. These concentrations of water soluble sulfates represent a Class 0 severity of exposure to sulfate attack on concrete exposed to these materials. The degree of attack is based on a range of Class 0 to Class 3 severity of exposure as presented in ACI 201. Based on this information and our experience with the soil types encountered, we believe special sulfate resistant cement will not be required for concrete exposed to the on-site soils.

SURFACE DRAINAGE

Providing proper surface drainage, both during construction and after the construction has been completed, is very important for acceptable performance of the building. The following recommendations should be used as guidelines and changes should be made only after

consultation with the geotechnical engineer.

1. Excessive wetting or drying of the foundation excavation and underslab areas should be avoided during construction.

2. Exterior backfill should be adjusted to a moisture content within 2 percent of optimum for granular soils and 0 to +4 percent of optimum for cohesive soils and compacted to at least 95% of the maximum standard Proctor density (ASTM D 698).

3. Care should be taken when compacting around the tank to avoid damage to the structure.

EXCAVATION CONSIDERATIONS

All excavations should be in accordance with OSHA, state and local requirements. In accordance with OSHA guidelines, the existing fill and native granular soils classify as a Type B material. Temporary unretained excavations in Type B materials should have slopes no steeper than 1:1 (H:V). A properly braced excavation or the use of a trench box should be used where the indicated unretained slopes cannot be accommodated. The soil types encountered can be prone to significant erosion during precipitation events. The contractor should take appropriate precautions during construction.

OSHA regulations require that excavations greater than 20 feet in depth be designed by a professional engineer. If soils different from those indicated in this report are encountered, the OSHA soil type may vary and the required cut slopes may need to be adjusted. The contractor's on-site "competent person" should confirm that all necessary slope and shoring design are performed. In addition, the slopes should be monitored on a regular basis for signs of movement and safety considerations.

DESIGN AND SUPPORT SERVICES

Kumar & Associates, Inc. should be retained to review the project plans and specifications for conformance with the recommendations provided in our report. We are also available to assist the design team in preparing specifications for geotechnical aspects of the project, and performing additional studies if necessary to accommodate possible changes in the proposed construction.

We recommend that Kumar & Associates, Inc. be retained to provide observation and testing services to document that the intent of this report and the requirements of the plans and specifications are being followed during construction, and to identify possible variations in subsurface conditions from those encountered in this study so that we can re-evaluate our recommendations, if needed.

LIMITATIONS

This study has been conducted in accordance with generally accepted geotechnical engineering practices in this area for exclusive use by the client for design purposes. The conclusions and recommendations submitted in this report are based upon data obtained from the exploratory boring at the approximate location indicated on Fig. 1, and the proposed construction. This report may not reflect subsurface variations that occur, and the nature and extent of variations across the site may not become evident until site grading and excavations are performed. If during construction, fill, soil, rock or water conditions appear to be different from those described herein, Kumar & Associates, Inc. should be advised at once so that a re-evaluation of the recommendations presented in this report can be made. Kumar & Associates, Inc. is not responsible for liability associated with interpretation of subsurface data by others.

The scope of services for this project does not include any environmental assessment of the site or identification of contaminated or hazardous materials or conditions. If the owner is concerned about the potential for such contamination, other studies should be undertaken.

JDC:bj

VICINITY MAP
NOT TO SCALE

18–2–174	Kumar & Associates	LOCATION OF EXPLORATORY BORING	Fig. 1

June 28, 2018 – 02:52pm
V:\Projects\2018\18-2-174 Lift Station and Force Main at Arrowhead Mobile Home Park\Drafting\182174-01.dwg

LEGEND

TOPSOIL.

SANDY LEAN CLAY (CL), MEDIUM PLASTICITY, STIFF, MOIST, LIGHT BROWN.

CLAYEY SAND (SC), LOW PLASTICITY, FINE TO COARSE GRAINED, MEDIUM DENSE TO DENSE, MOIST, LIGHT BROWN.

DRIVE SAMPLE, 2-INCH I.D. CALIFORNIA LINER SAMPLE.

13/12 DRIVE SAMPLE BLOW COUNT. INDICATES THAT ?? BLOWS OF A 140-POUND HAMMER FALLING 30 INCHES WERE REQUIRED TO DRIVE THE SAMPLER 12 INCHES.

NOTES

1. THE EXPLORATORY BORING WAS DRILLED ON JUNE 15, 2018 WITH A 4-INCH DIAMETER CONTINUOUS FLIGHT POWER AUGER.

2. THE LOCATION OF THE EXPLORATORY BORING WAS MEASURED APPROXIMATELY BY PACING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.
   - THE LOCATION OF THE EXPLORATORY BORING WAS MEASURED APPROXIMATELY BY TAPING FROM FEATURES SHOWN ON THE SITE PLAN PROVIDED.

3. THE ELEVATION OF THE EXPLORATORY BORING WAS NOT MEASURED AND THE LOG OF THE EXPLORATORY BORING IS PLOTTED TO DEPTH.

4. THE EXPLORATORY BORING LOCATION SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

5. THE LINES BETWEEN MATERIALS SHOWN ON THE EXPLORATORY BORING LOG REPRESENT THE APPROXIMATE BOUNDARIES BETWEEN MATERIAL TYPES AND THE TRANSITIONS MAY BE GRADUAL.

6. GROUNDWATER WAS NOT ENCOUNTERED IN THE BORING AT THE TIME OF DRILLING OR WHEN CHECKED 5 DAYS LATER.

7. LABORATORY TEST RESULTS:
   WC = WATER CONTENT (%) (ASTM D 2216);
   DD = DRY DENSITY (pcf) (ASTM D 2216);
   -200 = PERCENTAGE PASSING NO. 200 SIEVE (ASTM D 1140);
   LL = LIQUID LIMIT (ASTM D 4318);
   PI = PLASTICITY INDEX (ASTM D 4318);
   WSS = WATER SOLUBLE SULFATES (%) (AASHTO T 290);
   A-6 (8) = AASHTO CLASSIFICATION (GROUP INDEX) (AASHTO M 145).

18-2-174	Kumar & Associates	LOG OF EXPLORATORY BORING	Fig. 2

June 28, 2018 - 02:37pm
V:\Projects\2018\18-2-174 Lift Station and Force Main at Arrowhead Mobile Home Park\Drafting\182174-02.dwg

These test results apply only to the samples tested. The testing report shall not be reproduced, except in full, without the written approval of Kumar and Associates, Inc. Swell Consolidation testing performed in accordance with ASTM D-4546.

18-2-174	Kumar & Associates	SWELL-CONSOLIDATION TEST RESULTS	Fig. 3

June 21, 2018 - 08:32am
C:\Users\mromero\appdata\local\temp\AcPublish_16024\182174-03.dwg

Kumar and Associates, Inc.

TABLE I

SUMMARY OF LABORATORY TEST RESULTS

Project No.: 18-2-174
Project Name : Arrowhead Lift Station
Date Sampled:
Date Received: 6/18/2018

SAMPLE LOCATION		DATE TESTED	NATURAL MOISTURE CONTENT (%)	NATURAL DRY DENSITY (pcf)	GRADATION		PERCENT PASSING NO. 200 SIEVE	ATTERBERG LIMITS		WATER SOLUBLE SULFATES (%)	AASHTO CLASSIFICATION (Group Index)	SOIL OR BEDROCK TYPE (Unified Soil Classification)
BORING	DEPTH (ft)				GRAVEL (%)	SAND (%)		LIQUID LIMIT	PLASTICITY INDEX			
1	4	6/20/18	10.1	98.3			67	35	15	0.020	A-6 (8)	Sandy Lean Clay (CL)
1	9	6/20/18	15.2	105.7								

EXHIBIT O – MAP OF WELLS IN THE VICINITY OF THE PROJECT

CDSS
Colorado's Decision Support Systems

Map Viewer

Legend

- Well Constructed
- Permit Issued; Completion Sta
- County

Location

Notes

2 0 1 2 Miles

1: 63,360

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Date Prepared: 6/28/2017 9:02:06 AM

EXHIBIT P – FEMA FIRM MAP
WETLANDS MAP
IPAC RESOURCE LIST

APPROXIMATE SCALE IN FEET

2000 0 2000

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

EL PASO COUNTY, COLORADO AND INCORPORATED AREAS

PANEL 800 OF 1300

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS: COMMUNITY	NUMBER	PANEL	SUFFIX
EL PASO COUNTY, UNINCORPORATED AREAS	080059	0800	F

MAP NUMBER 08041C0800 F

EFFECTIVE DATE: MARCH 17, 1997

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

U.S. Fish and Wildlife Service

National Wetlands Inventory

AMHP

June 27, 2017

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper

IPaC **U.S. Fish & Wildlife Service**

IPaC resource list

This report is an automatically generated list of species and other resources such as critical habitat (collectively referred to as *trust resources*) under the U.S. Fish and Wildlife Service's (USFWS) jurisdiction that are known or expected to be on or near the project area referenced below. The list may also include trust resources that occur outside of the project area, but that could potentially be directly or indirectly affected by activities in the project area. However, determining the likelihood and extent of effects a project may have on trust resources typically requires gathering additional site-specific (e.g., vegetation/species surveys) and project-specific (e.g., magnitude and timing of proposed activities) information.

Below is a summary of the project information you provided and contact information for the USFWS office(s) with jurisdiction in the defined project area. Please read the introduction to each section that follows (Endangered Species, Migratory Birds, USFWS Facilities, and NWI Wetlands) for additional information applicable to the trust resources addressed in that section.

NOT FOR CONSULTATION

Location

El Paso County, Colorado

Local office

Colorado Ecological Services Field Office

(303) 236-4773
(303) 236-4005

MAILING ADDRESS

Denver Federal Center
P.O. Box 25486
Denver, CO 80225-0486

PHYSICAL ADDRESS

134 Union Boulevard, Suite 670
Lakewood, CO 80228-1807

http://www.fws.gov/coloradoES
http://www.fws.gov/platteriver

NOT FOR CONSULTATION

Endangered species

This resource list is for informational purposes only and does not constitute an analysis of project level impacts.

The primary information used to generate this list is the known or expected range of each species. Additional areas of influence (AOI) for species are also considered. An AOI includes areas outside of the species range if the species could be indirectly affected by activities in that area (e.g., placing a dam upstream of a fish population, even if that fish does not occur at the dam site, may indirectly impact the species by reducing or eliminating water flow downstream). Because species can move, and site conditions can change, the species on this list are not guaranteed to be found on or near the project area. To fully determine any potential effects to species, additional site-specific and project-specific information is often required.

Section 7 of the Endangered Species Act **requires** Federal agencies to "request of the Secretary information whether any species which is listed or proposed to be listed may be present in the area of such proposed action" for any project that is conducted, permitted, funded, or licensed by any Federal agency. A letter from the local office and a species list which fulfills this requirement can **only** be obtained by requesting an official species list from either the Regulatory Review section in IPaC (see directions below) or from the local field office directly.

For project evaluations that require USFWS concurrence/review, please return to the IPaC website and request an official species list by doing the following:

1. Draw the project location and click CONTINUE.
2. Click DEFINE PROJECT.
3. Log in (if directed to do so).
4. Provide a name and description for your project.
5. Click REQUEST SPECIES LIST.

Listed species[1] and their critical habitats are managed by the Ecological Services Program of the U.S. Fish and Wildlife Service (USFWS) and the fisheries division of the National Oceanic and Atmospheric Administration (NOAA Fisheries[2]).

Species and critical habitats under the sole responsibility of NOAA Fisheries are **not** shown on this list. Please contact NOAA Fisheries for species under their jurisdiction.

---

1. Species listed under the Endangered Species Act are threatened or endangered; IPaC also shows species that are candidates, or proposed, for listing. See the listing status page for more information.
2. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

The following species are potentially affected by activities in this location:

Mammals

NAME	STATUS

NOT FOR CONSULTATION

North American Wolverine Gulo gulo luscus — Proposed Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/5123

Preble's Meadow Jumping Mouse Zapus hudsonius preblei — Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/4090

Birds

NAME	STATUS
Least Tern Sterna antillarum	Endangered
Mexican Spotted Owl Strix occidentalis lucida	Threatened
Piping Plover Charadrius melodus	Threatened
Whooping Crane Grus americana	Endangered

Least Tern

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.

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/8505

Mexican Spotted Owl

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/8196

Piping Plover

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.

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/6039

Whooping Crane

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.

There is **final** critical habitat for this species. Your location is outside the critical habitat.
https://ecos.fws.gov/ecp/species/758

Fishes

NAME	STATUS

NOT FOR CONSULTATION

Greenback Cutthroat Trout Oncorhynchus clarkii stomias — Threatened

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/2775

Pallid Sturgeon Scaphirhynchus albus — Endangered

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.

No critical habitat has been designated for this species.
https://ecos.fws.gov/ecp/species/7162

Flowering Plants

NAME	STATUS
Ute Ladies'-tresses Spiranthes diluvialis No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/2159	Threatened
Western Prairie Fringed Orchid Platanthera praeclara 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. No critical habitat has been designated for this species. https://ecos.fws.gov/ecp/species/1669	Threatened

NOT FOR CONSULTATION

Critical habitats

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves.

THERE ARE NO CRITICAL HABITATS AT THIS LOCATION.

Migratory birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats should follow appropriate regulations and consider implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.

2. The Bald and Golden Eagle Protection Act of 1940.

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeasures.pdf

MIGRATORY BIRD INFORMATION IS NOT AVAILABLE AT THIS TIME

Tell me more about conservation measures I can implement to avoid or minimize impacts to migratory birds.

Nationwide Conservation Measures describes measures that can help avoid and minimize impacts to all birds at any location year round. Implementation of these measures is particularly important when birds are most likely to occur in the project area. When birds may be breeding in the area, identifying the locations of any active nests and avoiding their destruction is a very helpful impact minimization measure. To see when birds are most likely to occur and be breeding in your project area, view the Probability of Presence Summary. Additional measures and/or permits may be advisable depending on the type of activity you are conducting and the type of infrastructure or bird species present on your project site.

What does IPaC use to generate the migratory birds potentially occurring in my specified location?

The Migratory Bird Resource List is comprised of USFWS Birds of Conservation Concern (BCC) and other species that may warrant special attention in your project location.

The migratory bird list generated for your project is derived from data provided by the Avian Knowledge Network (AKN). The AKN data is based on a growing collection of survey, banding, and citizen science datasets and is queried and filtered to return a list of those birds reported as occurring in the counties which your project intersects, and that have been identified as warranting special attention because they are a BCC species in that area, an eagle (Eagle Act requirements may apply), or a species that has a particular vulnerability to offshore activities or development.

Again, the Migratory Bird Resource list includes only a subset of birds that may occur in your project area. It is not representative of all birds that may occur in your project area. To get a list of all birds potentially present in your project area, please visit the E-bird Explore Data Tool.

What does IPaC use to generate the probability of presence graphs for the migratory birds potentially occurring in my specified location?

The probability of presence graphs associated with your migratory bird list are based on data provided by the Avian Knowledge Network (AKN). This data is derived from a growing collection of survey, banding, and citizen science datasets .

Probability of presence data is continuously being updated as new and better information becomes available. To learn more about how the probability of presence graphs are produced and how to interpret them, go the Probability of Presence Summary and then click on the "Tell me about these graphs" link.

How do I know if a bird is breeding, wintering, migrating or present year-round in my project area?

NOT FOR CONSULTATION

To see what part of a particular bird's range your project area falls within (i.e. breeding, wintering, migrating or year-round), you may refer to the following resources: The The Cornell Lab of Ornithology All About Birds Bird Guide, or (if you are unsuccessful in locating the bird of interest there), the Cornell Lab of Ornithology Neotropical Birds guide. If a bird entry on your migratory bird species list indicates a breeding season, it is probable that the bird breeds in your project's counties at some point within the timeframe specified. If "Breeds elsewhere" is indicated, then the bird likely does not breed in your project area.

What are the levels of concern for migratory birds?

Migratory birds delivered through IPaC fall into the following distinct categories of concern:

1. "BCC Rangewide" birds are Birds of Conservation Concern (BCC) that are of concern throughout their range anywhere within the USA (including Hawaii, the Pacific Islands, Puerto Rico, and the Virgin Islands);
2. "BCC - BCR" birds are BCCs that are of concern only in particular Bird Conservation Regions (BCRs) in the continental USA; and
3. "Non-BCC - Vulnerable" birds are not BCC species in your project area, but appear on your list either because of the Eagle Act requirements (for eagles) or (for non-eagles) potential susceptibilities in offshore areas from certain types of development or activities (e.g. offshore energy development or longline fishing).

Although it is important to try to avoid and minimize impacts to all birds, efforts should be made, in particular, to avoid and minimize impacts to the birds on this list, especially eagles and BCC species of rangewide concern. For more information on conservation measures you can implement to help avoid and minimize migratory bird impacts and requirements for eagles, please see the FAQs for these topics.

Details about birds that are potentially affected by offshore projects

For additional details about the relative occurrence and abundance of both individual bird species and groups of bird species within your project area off the Atlantic Coast, please visit the Northeast Ocean Data Portal. The Portal also offers data and information about other taxa besides birds that may be helpful to you in your project review. Alternately, you may download the bird model results files underlying the portal maps through the NOAA NCCOS Integrative Statistical Modeling and Predictive Mapping of Marine Bird Distributions and Abundance on the Atlantic Outer Continental Shelf project webpage.

Bird tracking data can also provide additional details about occurrence and habitat use throughout the year, including migration. Models relying on survey data may not include this information. For additional information on marine bird tracking data, see the Diving Bird Study and the nanotag studies or contact Caleb Spiegel or Pam Loring.

What if I have eagles on my list?

If your project has the potential to disturb or kill eagles, you may need to obtain a permit to avoid violating the BGEPA should such impacts occur.

Facilities

National Wildlife Refuge lands

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

NOT FOR CONSULTATION

THERE ARE NO REFUGE LANDS AT THIS LOCATION.

Fish hatcheries

THERE ARE NO FISH HATCHERIES AT THIS LOCATION.

Wetlands in the National Wetlands Inventory

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

THERE ARE NO KNOWN WETLANDS AT THIS LOCATION.

Data limitations

The Service's objective of mapping wetlands and deepwater habitats is to produce reconnaissance level information on the location, type and size of these resources. The maps are prepared from the analysis of high altitude imagery. Wetlands are identified based on vegetation, visible hydrology and geography. A margin of error is inherent in the use of imagery; thus, detailed on-the-ground inspection of any particular site may result in revision of the wetland boundaries or classification established through image analysis.

The accuracy of image interpretation depends on the quality of the imagery, the experience of the image analysts, the amount and quality of the collateral data and the amount of ground truth verification work conducted. Metadata should be consulted to determine the date of the source imagery used and any mapping problems.

Wetlands or other mapped features may have changed since the date of the imagery or field work. There may be occasional differences in polygon boundaries or classifications between the information depicted on the map and the actual conditions on site.

Data exclusions

Certain wetland habitats are excluded from the National mapping program because of the limitations of aerial imagery as the primary data source used to detect wetlands. These habitats include seagrasses or submerged aquatic vegetation that are found in the intertidal and subtidal zones of estuaries and nearshore coastal waters. Some deepwater reef communities (coral or tuberficid worm reefs) have also been excluded from the inventory. These habitats, because of their depth, go undetected by aerial imagery.

Data precautions

Federal, state, and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, state, or local government or to establish the geographical scope of the regulatory programs of government agencies. Persons intending to engage in activities involving modifications within or adjacent to wetland areas should seek the advice of appropriate federal, state, or local agencies concerning specified agency regulatory programs and proprietary jurisdictions that may affect such activities.

NOT FOR CONSULTATION

EXHIBIT Q – SITE APPLICATION REQUEST FOR INFORMATION FROM CDPHE

July 30, 2018

Dayton and Leah Orsburn, Co-Trustees
Arrowhead Mobile Home Park
PO Box 154
Chino Hills, CA 91709

Subject: Site Location Application - Request for Information
Arrowhead Mobile Home Park, Lift Station
Associated WWTF CDPS Permit No. COX048348
El Paso County
ES Project No. ES.17.SA.03578, Enforcement Order Number DO-160518-1

Dear Ms. Martinez:

The Water Quality Control Division (Division) has reviewed the Arrowhead Mobile Home Park (MHP) Lift Station Site Application submission by Element Engineering, LLC on behalf of Dayton and Leah Orsburn, Co-Trustees. Based on the Division's initial review, the site location application does not meet the requirements of the Water Quality Control Commission's *Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works, 5 CCR 1002-22* (Regulation 22) and cannot be approved at this time. For additional information, please refer to the *Guidance Document for the Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works, 5 CCR 1002-22* (Guidance Document), which is available at http://www.colorado.gov/cdphe/wq-guidance under the "Clean water regulatory guidance" heading.

1. In accordance with Section 22.7(1)(f)(iii) of Regulation 22, the applicant shall provide an adequate engineering report that shall provide confirmation, in writing, from the wastewater treatment entity that it has not been in violation of any effluent limitations in its discharge permit for the last two years and is not operating under a Notice of Violation and/or Cease and Desist Order from the Division resulting from discharge permit violations. Alternatively, if there have been effluent violations or if the treatment plant is operating under a Notice of Violation and/or Cease and Desist Order from the Division, then the Division will evaluate the situation and the treatment entities' proposed corrective measures to achieve consistent compliance and determine if approval should be granted, granted with conditions, or denied. In addition, Section 22.3(2)(a) of Regulation 22 specifies that each application for site location approval shall be reviewed to ensure that the existing treatment works will not be overloaded when connecting new lift stations. The engineering report identifies that Cherokee Metropolitan District (CMD) will be responsible for treating the wastewater from the Arrowhead MHP lift station. CMD is currently operating under the terms of a Compliance Order on Consent (COC), in part, for violating the total dissolved solids (TDS) limitation established in the facility's discharge permit. The COC includes an implementation plan and compliance schedule for meeting the TDS limitations, but current discharge data indicates that the TDS limitation continues to be exceeded. Based on sampling data provided, wastewater from Arrowhead MHP appears to be in excess of the 400 milligrams per Liter (mg/L) TDS limitation established in CMD's discharge permit. Therefore, if Arrowhead MHP were to connect to CMD through the proposed lift station, Arrowhead MHP may contribute to CMD's exceedance of the TDS limitation. Please demonstrate how the additional flow and load from Arrowhead MHP will not contribute to overloading CMD's existing water reclamation facility considering that the facility is currently exceeding its effluent limitation for TDS. Note, treatment for TDS may be required at Arrowhead MHP to ensure TDS contributions do not add to CMD's exceedances.

2. In accordance with Section 22.7(2) of Regulation No. 22, the application shall be forwarded to the city, town, or county in whose jurisdiction(s) the lift station and/or interceptor sewer is to be located for review and comment, and in accordance with Section 22.7(3) of Regulation No. 22, the application

shall be forwarded to the 208 planning agency for the area in which the facilities are to be constructed and for the area to be served by those facilities for review and comment. While the site application appears to have been forwarded to El Paso County, El Paso County Public Health, and the Pikes Peak Area Council of Governments, a response from the review agencies was not provided with the site application submittal. Please submit the signature portion of the site application form to the Division with the review agencies acknowledging that they had the opportunity to review and comment on the site application.

Please submit a written response to this letter that addresses the identified issues. Following receipt of your response submission, the Division will resume review work on the project. Thank you for your time and cooperation in this matter. Please contact me by telephone at 303-692-6337 or by electronic mail at michael.emming@state.co.us if you have any questions.

Sincerely,

Michael G. Emming, P.E.
Senior Review Engineer
Engineering Section | Water Quality Control Division
Colorado Department of Public Health and Environment

cc: Nicholaus Marcotte, Element Engineering, LLC
Michael Poeckes, Cherokee Metropolitan District
Norm Steen, Pikes Peak Area Council of Governments
Aaron Doussett, El Paso County Public Health
Mark Gebhart, El Paso County, Development Services Department
Bret Icenogle, WQCD ES Engineering Section Manager
Amy Zimmerman, WQCD ES Unit Manager
Doug Camrud, WQCD ES Unit Manager
Mandy Mercer, WQCD CW EU Enforcement Specialist
Site Application File | Discharge Permit File (COX048348)

EXHIBIT R – SITE APPLICATION SIGNATURE PAGE

Colorado Department of Public Health and Environment

Water Quality Control Division
Engineering Section

4300 Cherry Creek Drive South, B2
Denver, Colorado 80246-1530
CDPHE.WQEngReview@state.co.us
303-692-6298

Applicant Certification and Review Agencies Recommendation
Section 22.7 of Regulation 22: Interceptor Sewers Not Eligible for Certification and Lift Stations

A. Project and System Information	
System Name	Arrowhead Mobile Home Park
Project Title	Arrowhead Mobile Home Park Lift Station
County	El Paso

1. Applicant Certification

I certify that I am familiar with the requirement of *Regulation 22 - Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works*, and have posted the site in accordance with the Regulations. An engineering report, as described by the regulations, has been prepared and is enclosed.

Applicant Legal Representative (e.g. Public Works Director)	Date	Typed Name	Signature
Owner	6/12/18	Dayton Orsburn	

The system legal representative is the legally responsible agent and decision-making authority (e.g. mayor, president of a board, public works director, owner). The Consulting Engineer is not the legal representative and cannot sign this form.

2. Recommendation of Review Agencies

As required in Section 22.7(2 and 3), the application and the engineering report must be submitted to all appropriate local governments, 208 planning agencies and State agencies for review and comment prior to submittal to the Division. By signing below, the entity or agency: 1) acknowledges receipt of the proposed site location application, 2) has reviewed the proposed site location application and may elect to provide comments, and 3) has provided a recommendation to the Division. The recommendation should be based on the consistency of the proposed site location application with the local comprehensive plan(s) as they relate to water quality and any adopted water quality management plans(s). *Please note: If a governmental authority does not recommend approval then the authority must attached a letter describing the reason for their decision or comment on the next page.*

Signature of County, if proposed facility is located in unincorporated areas of a county

Role	Date	Typed Name / Agency	Signature				
		El Paso County	Recommend Approval?	Yes	☐	No	☐

Signature of City or Town, if site is located within three miles of the City/Town boundary

Role	Date	Typed Name / Agency	Signature				
			Recommend Approval?	Yes	☐	No	☐

Signature of Local Health Authority

Role	Date	Typed Name / Agency	Signature				
EH Manager	8-13-18	El Paso County Department of Health & Environment	Recommend Approval?	Yes	☒	No	☐

Signature of 208 Planning Agency

Role	Date	Typed Name / Agency	Signature				
CHAIR	8/8/18	Pike's Peak Area Council of Local Governments	Recommend Approval?	Yes	☒	No	☐

EXHIBIT S – LEGAL DESCRIPTION OF PROJECT AREA

12 February 2018

Legal Description

A parcel of land located within Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado being more particularly described as follows:

The South 1/2 of the Southwest 1/4 of the Northwest 1/4 of Section 15, Township 14 South, Range 64 West of the 6th P.M., El Paso County, Colorado as recorded in Book 5872 at Page 1387, Reception Number, of the records of the Clerk and Recorder, El Paso County, Colorado;

Except Parcel A, as recorded in Reception Number 203108692, of the records of the Clerk and Recorder, El Paso County, Colorado, being further described as follows:

From the Point of Commencement at the west quarter corner of Section 15, thence N89˚46'41"E a distance of 30.00 feet to intersect the existing east right-of -way line of Curtis Road for the Point of Beginning.

Thence the following four (4) courses:

1. Along said east right-of way line of Curtis Road N00˚15'10"W a distance of 656.56 feet to intersect the north line of the aforesaid parcel.
2. Along the north line of said parcel N89˚07'42"E a distance of 10.00 feet to intersect a line drawn parallel to and 40.00 feet east of the west line of said Section 15.
3. Along said parallel line S00˚15'10"E a distance of 656.39 feet to intersect the south line of the aforesaid parcel.
4. Along said south line S89˚52'39"W a distance of 10.00 feet to the Point of Beginning.

Cameron Forth,
Colorado Professional Land Surveyor, #38390