PLUM VALLEY HEIGHTS SUBDISTRICT
of the ROXBOROUGH WATER AND
SANITATION DISTRICT

NWDC WATER PROJECT
PRELIMINARY ENGINEERING REPORT

OCTOBER 2014

Prepared By:

TST Infrastructure, LLC
61 Inverness Drive East, Suite 100
Englewood, CO 80112
303.799.5197

042.001.00

Drinking Water Preliminary Engineering Report Guidance & Review Checklist Form

Name of Project: NWDC Water Project

Applicant Name: Plum Valley Heights Subdistrict of the Roxborough Water and Sanitation District Phone Number: 303-979-7286
Address: 6222 N. Roxborough Park Road
Littleton, CO 80125
Email: larry@roxwater.org

Consultant Name: TST Infrastructure, LLC Phone Number: 303-799-5197
Address: William T. Goetz, P.E
61 Inverness Drive East, Suite 100
Englewood, CO 80125
.
Email: bgoetz@tstinfrastructure.com

Type of Project: Distribution and Storage

WQCD District Engineer: Phone Number:
WQCD Project Manager: Phone Number:

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page # (Applicant)	Complete (Reviewer)
(1) Executive Summary	**Summarize the system needs, selected alternative, and the public health benefits of the proposed project**.		

(2) Planning Conditions	**This section should contain an overview of the significant regional features defining the context of the report and proposed project. Displaying much of the information in map and tabular formats is highly recommended for ease of review and discussion.**		
(2.1) Planning Area	Include map(s) of current and projected service area for the 20-year planning period; identify environmental features such as streams, lakes, wetlands, and floodplains for the entire planning area. *This documentation does not require field surveys and may be obtained from existing data sources such as the National Wetlands Inventory, FEMA and USGS.*	3	
(2.2) Local and Regional Government Coordination	If the proposed project is within or near an urban growth boundary, address conformance with the boundary and any other planning limitations such as tap or water quantity/supply limitations.	3	
(2.3) Growth Areas and Population Trends	Summarize population projections for the project planning area for a 20-year period; compute and compare recent growth rates with projected growth rates; estimate increases in equivalent residential units (EQRs); identify specific areas of concentrated growth; and reference sources of this information.	3	
(2.4) Drinking Water Supply	Briefly summarize projected drinking water demands (average day, peak day and peak hour) for the project planning area for the 20-year planning period. Summarize flow reduction	4	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page # (Applicant)	Complete (Reviewer)
	measures such as water conservation plan measures. Address the supply source(s) and primary water quality parameters of concern.		

(3) Description of Existing Facilities	**This section should provide a description of the existing treatment and distribution facilities**.		
(3.1) Service Area Features	On the planning area map, identify the locations of existing drinking water treatment plants, water sources, major distribution lines, and storage facilities.	5	
(3.2) Facilities Layout and Description	Provide a process flow schematic layout and narrative description of existing treatment facilities including design capabilities and remaining useful life as compared to state design criteria. Describe present adequacy of water supply, storage, and distribution capabilities of any existing central facilities. Include current population and per capita flows (gpcd). Note the quantity of unaccounted for water (e.g., distribution system losses).	5	
(3.3) Financial Status and Users	Discuss the financial status of the drinking water system including O & M costs, existing debt, required reserve accounts, rate structure and other capital improvement programs. Also include a tabulation of volumes used by types of users (e.g., residential, commercial, industrial) for the most recent typical fiscal year.	6	
(3.4) Technical, Managerial and Financial (TMF) Capacity	Highlight TMF Capacity issues of concern as indicated by the TMF guidance for the State Revolving Fund program.	7	

(4) Project Purpose and Need	**This section should document the applicable reasons for considering modifications to the existing facilities.**		
(4.1) Health and Compliance	Include a discussion of the system's current compliance status with the "Colorado Primary Drinking Water Regulations" and its potential for acute or chronic health risks. Evaluate any other current or future drinking water quality and quantity issues including secondary MCLs.	9	
(4.2) Security	Summarize results of most recent vulnerability assessment.	9	
(4.3) Operation and Maintenance (O&M)	Identify applicable O&M issues such as operational constraints, water loss, and adequate controls.	10	
(4.4) Growth	Summarize quality and quantity concerns; considerations for consolidation and phased capacity; reasons for projected future	11	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page # (Applicant)	Complete (Reviewer)
	growth during planning period; support by additional revenues and local and regional planning efforts. Note: projects designed solely to serve future development and population growth are not eligible for State Revolving Fund financing.		

(5) Assessment of Alternatives	**This section should contain a description of the reasonable alternatives (no action, blending, optimizing the current facilities, and interconnecting with other existing facilities) that were considered in planning a solution to meet the identified needs. If alternatives for upgrades or new treatment facilities alternatives are considered, include the EPA Best Available Technology (BAT) for contaminant(s) removed. Complete assessments should be grouped by alternative and should include information requested in (5.1) through (5.8) below:**		
(5.1) Description	Describe and compare all feasible water treatment technologies, including new technologies that have been thoroughly tested and installed or piloted with successful operating and compliance track records, water supply sources, and the facilities, including distribution facilities (storage, transmission and pumping), associated with each alternative.	12	
(5.2) Design Criteria	State the design parameters, including the need to meet primary drinking water standards, used for evaluation purposes of each alternative. The parameters must comply with state regulatory requirements (Ref. WQCD Policy State of Colorado Design Criteria for Potable Water Systems.) Address treatment residuals management and ultimate disposal methods and costs in detail.	15	
(5.3) Environmental Impacts	Describe direct and indirect impacts unique to each alternative on floodplains, wetlands, wildlife habitat, historical and archaeological properties, etc., including any projected permits and certifications.	16	
(5.4) Land Requirements	Identify all necessary sites and easements, as well as permits and certifications, required for each alternative, and specify if the properties are currently owned, to be acquired, or leased by the applicant.	16	
(5.5) Construction Problems	Discuss concerns such as subsurface rock, high water table, limited access, or other conditions that may affect cost of construction or operation of a facility for each alternative.	16	
(5.6) Operational Aspects	Discuss, in general terms, the staffing requirements, certification level requirements (including distribution), and the expected basic operating configuration and process control complexities for each alternative.	17	
(5.7) Cost Estimates	Provide cost estimates for each alternative, including breakdowns for construction, non-construction, and annual operations and maintenance, as well as a present worth analysis for each alternative. A reasonable discount rate should be used for determining the present worth of the uniform series of O&M values (in today's dollars) and the salvage value.	17	
(5.8) Advantages/	Describe, in a narrative format, how each alternative affects the applicant's current and future needs with respect to technical,	18	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page # (Applicant)	Complete (Reviewer)
Disadvantages	managerial, and financial concerns; how each alternative complies with regulatory requirements; and how each alternative satisfies public and environmental concerns. Summarize, in a matrix rating system, the advantages and disadvantages of each alternative for clarity.		

(6) Selected Alternative	This section should contain the detailed description of the chosen alternative.		
(6.1) Justification of Selected Alternative	Demonstrate the recommended alternative is the most favorable based on monetary and non-monetary considerations covered in section 5 above. Address whether or not the technology is addressed in the CDPHE design criteria. If the EPA-BAT technology is not selected please include rationale.	20	
(6.2) Technical Description	Describe the major features – water source(s); schematic flow diagram of unit treatment processes; unit process sizes (including clearwell); treated water storage capacity; residual handling; treatment and distribution system operator requirements; design criteria – design flow, reserve capacity, process loading rates, treatment log removals, disinfection log removals; any other information pertinent or unique to treatment. Include a bulleted list of all project components and identify which are eligible or ineligible for State Revolving Fund assistance. For more information on determining eligibility please see the "State Revolving Fund Eligibility Assessment Guidance Document." Also be sure to highlight components of the project designed specifically for any of the following purposes: water conservation, source water protection, or beneficial use of sludge.	20	
(6.3) Environmental Review of Selected Alternative	To facilitate the environmental determination process, we require the Environmental Assessment Checklist be completed for the selected alternative and included as an appendix to the PER. This document can be found on the CDPHE WQCD FSU website : http://www.cdphe.state.co.us/wq/Grantsandloansunit/index.html	22	
(6.4) Green Project Reserve	Describe any green components incorporated into the selected alternative. The components should be categorized as one or more of the following four EPA definitions: Green Infrastructure, Water Efficiency, Energy Efficiency or Environmentally Innovative. Reference: April 21, 2010 EPA Procedures for implementing Certain Provisions of EPA's Fiscal Year 2010 Appropriation Affecting the Clean Water and Drinking Water State Revolving Fund Programs, Attachment 2: 2010 Clean Water and Drinking Water State Revolving Fund 20% Green Project Reserve: Guidance for Determining Project Eligibility. This document can be found on the CDPHE WQCD FSU website : http://www.cdphe.state.co.us/wq/Grantsandloansunit/index.html	23	
(6.5) Costs	Provide detailed project-related capital costs, operation and	23	

Section (Suggested Outline)	Necessary Elements (Guidance)	Addressed on Page # (Applicant)	Complete (Reviewer)
	maintenance budget – staffing, training, materials, electricity, lab expenses, residual disposal, compliance monitoring etc.; replacement costs; projected increase in and total average monthly user charges; 20-year cash flow projection spreadsheet. If some components are ineligible for funding (see Section 6.2), identify specific costs associated with the eligible and ineligible components.		
(6.6) Project Implementation	Hold a public meeting with 30-day notice period and summarize outcome; financing recommendations; legal arrangements, intergovernmental agreements; project schedule and/or time required for completion of design and construction – substantial and final completion. Note that a separate Technical, Managerial, and Financial (TMF) Capacity Review process will be required as part of the State Revolving Fund Program. Design approval, a monitoring plan, and vulnerability assessment are additional steps in the implementation process.		

Prepared By: _____ Date: 10/30/14

Reviewed By: _____ Date: _____

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

1 EXECUTIVE SUMMARY

Roxborough Water and Sanitation District (RWSD or District) provides water and sewer service within its existing district boundaries. The District currently provides water service to approximately 3,400 Equivalent Residential Units (EQRs), with a planned buildout of 3,800 EQRs.

Several existing developments located in close proximity to RWSD were developed in the 1970s and 1980s, and are currently supplied by non-renewable groundwater from the Denver Basin aquifers. The existing developments include Chatfield Acres, Chatfield East, Titan Road Industrial Park and Plum Valley Heights. Chatfield Acres, Chatfield East, and Plum Valley Heights are residential developments currently served by individual wells. Titan Road Industrial Park includes commercial and light industrial development currently served by two existing non-tributary wells and an existing distribution system.

Water levels in the Denver Basin aquifers are declining and will continue to decline with continued use of the aquifer as a significant source of water for northern Douglas County. The existing developments located near RWSD are located near the margins of the aquifers, and water levels in this area decline sooner and more rapidly than in more central parts of the aquifers. As a result existing wells in the area have failed, or are in danger of failing.

Under the proposed project, the existing developments would receive potable water service from RWSD. The maximum number of EQRs to be served by the proposed project is 251, 228 of which are existing. The existing developments to be served by the proposed project would be included in the Roxborough Water and Sanitation District and the Plum Valley Heights Subdistrict of the Roxborough Water and Sanitation District (PVHSD or Subdistrict).

As this project was developed, a wide range of water service options were considered including service from Centennial Water and Sanitation District, Dominion Water and Sanitation District, and Roxborough Water and Sanitation District. Previous studies identified RWSD as the preferred service provider. A number of alternatives for service by RWSD were evaluated ranging from larger projects to provide domestic and fire flow service to future as well as existing development, to a more limited scope project which supplies only domestic service to the existing development areas.

The selected alternative is the limited scope project which provides domestic service only to the existing development areas. Under the selected alternative, the existing developments will be included in the RWSD, and will receive water service from the District.

RWSD obtains its raw water supply by contract with the City of Aurora, and has obtained an additional supply of 150 AF/Y which will be used to supply the additional units. Treatment service will be provided at the existing RWSD water treatment facility which has adequate capacity to serve the existing additional units.

New distribution and storage facilities will be required to serve the existing units and will include approximately 12 miles of new distribution pipelines and a 260,000 gallon water storage tank. The new facilities will be constructed by the Plum Valley Heights Subdistrict, and existing development

units will be required to connect to the distribution system within 2 years of completion of the system.

The proposed project provides for consolidation of services by connecting existing developments to the RWSD system. The project also eliminates reliance on non-tributary groundwater.

2 PLANNING CONDITION

2.1 Planning Area

The existing water service area for the Roxborough Water and Sanitation District includes approximately 3,687 acres on the east and west sides of the hogback in northwestern Douglas County. The District currently provides water service to approximately 3,400 EQRs, with a planned buildout of 3,800 EQRs. It is anticipated that the remaining 400 EQRs will be infill units located within the existing district boundary. With the exception of water treatment capacity, all of the infrastructure required to serve the current planning area at buildout is in place. The District is currently designing a new water treatment facility that will provide adequate capacity for buildout. Construction of the new treatment facility is scheduled to begin in 2015 and is expected to be complete in late 2016. The location of the District's existing water service area is presented in Figure 1.

The existing water service area is located south of Chatfield Reservoir between the South Platte River and East Plum Creek. Flood plains, wetlands and riparian habitat are generally located in close proximity to the river, the creek and their associated drainages.

The existing development areas to be served by the proposed project are located north and east of the District's existing service area. Chatfield Acres and Chatfield East are located to the east of both S. Santa Fe Drive, and Plum Creek near the intersection of Titan Road and S. Santa Fe Drive. Titan Road Industrial Park (TRIP) is located south of Titan Road between S. Santa Fe Drive and Plum Creek. Plum Valley Heights (PVH) is located along Moore Road, directly east of the District's existing water treatment facility, and west of both Plum Creek and S. Santa Fe Drive.

2.2 Local and Regional Government Coordination

The primary agency for land use regulation in the proposed project area is Douglas County. All of the proposed areas to be served are designated as non-urban areas in the Douglas County Comprehensive Master Plan. Douglas County is fully supportive of the concept of providing water to the proposed project area, and is a significant participant in the project.

The Denver Regional Council of Governments (DRCOG) provides general planning guidelines for the Denver Metropolitan Area through its MetroVision Plan. The MetroVision Plan includes an Urban Growth Boundary (UGB) for the entire Metro area. The UGB is not applicable to the proposed project because all of the proposed service areas are designated as rural areas by Douglas County, and the proposed project will provide service only to existing developments.

2.3 Growth Areas and Population Trends

The proposed project is not intended to support new growth. The development areas to be served were developed in the 1970s and 1980s, and are close to buildout. The proposed project has the capacity to serve 251 EQRs, 228 of which are existing. The remainder available capacity

will be utilized to serve infill lots within the existing developments, or adjacent existing development.

2.4 Drinking Water Supply

RWSD obtains its existing raw water supply through a permanent agreement with the City of Aurora. The supply consists entirely of surface water from the South Platte River, delivered to the RWSD treatment facility through Aurora's existing raw water system. Water is diverted from the South Platte River at Strontia Springs Reservoir and conveyed by tunnel to the Aurora Rampart Reservoir. Water released from Rampart Reservoir is conveyed to the RWSD treatment facility via existing 42" and 54" raw water conduits.

The District's 2010 agreement with Aurora provides for a raw water supply of 1,800 AF/Y to serve a maximum of 3,800 EQRs, or 0.4737 AF/Y/EQR. The water provided under the 2010 agreement is adequate to serve the anticipated buildout of the current water service area. The District recently entered into a second water supply agreement (the 150 Agreement) with Aurora which provides for a maximum of 150 AF/Y supply for the areas to be served under the proposed project, subject to the same 0.4737 AF/Y/EQR requirement contained in the 2010 agreement. The water supply available under the 150 Agreement provides an adequate supply for the areas to be served.

The water supply for the proposed project will be conveyed and treated along with RWSD's existing water supply. Roxborough has years of experience treating this particular water source, and no particular water quality parameters of concern have been identified. Roxborough's raw water source is extremely high quality, and treatment strategy is based primarily on compliance with surface water treatment rules.

Calculated demands for the project area, based on 251 EQRs are:

Average Day – 98,267 gpd	68 gpm
Max Day – 255,493 gpd	177 gpm
Peak Hour – 383,239 gpd	266 gpm

3 DESCRIPTION OF EXISTING FACILITIES

3.1 Service Area Features

The existing RWSD water system includes a water treatment facility, transmission pipelines, distribution pipelines, pump stations, and storage tanks. The location and configuration of the existing system is presented in Figure 2. Raw water is received from the Aurora system and treated at the RWSD water treatment facility. Treated water is conveyed to the distribution system and storage tanks. The distribution system includes 4 pressure zones. High service pumps at the treatment facility convey water to Zone 1, the lowest zone. Pump stations in the distribution system subsequently convey water to the upper zones. Each zone includes its own water storage tank(s). All storage tanks are below grade, concrete tanks.

Except for the raw water delivery system and the water treatment facility, none of the existing water infrastructure will be used to serve the proposed project.

3.2 Facilities Layout and Description

The existing treatment facility provides conventional treatment of the surface water supply including coagulation, flocculation, sedimentation, granular media filtration and disinfection. A schematic of the existing treatment process is presented in Figure 3.

Raw water enters the facility, is metered and conveyed to the rapid mix chamber. Dry alum is used as the primary coagulant and polymer is added as a settling aid. Flocculation and sedimentation occur in rectangular concrete basins located adjacent to the filter building. Settled water is conveyed from the clarifiers to the filters via a concrete conduit and individual filter piping. Filtration occurs in dual media granular filters and filtered water adjusted to the proper pH using soda ash. Disinfectant (chlorine) is added to the filtered water prior to discharge to the clearwell. Disinfection contact time is provided by the clearwell and the transmission pipeline.

The existing treatment facility has an overall capacity of 2.8 MGD based on the capacity of the existing filters. The maximum day demand on the facility by RWSD's existing customers is approximately 1.211 MGD. The remaining capacity is adequate to serve the proposed project.

The existing treatment facility was originally constructed in 1958, and has been modified and upgraded numerous times. Due to its age, RWSD has determined that the facility is reaching its useful life and should be replaced. RWSD is currently designing a new treatment facility to replace the existing facility, and the design for the new facility has been submitted to CDPHE for design approval. The new facility will provide RWSD with 4 MGD of treatment capacity which will provide sufficient capacity for RWSD at buildout, including the proposed project.

Based the anticipated schedules for the proposed project and the new water treatment facility, it is anticipated that the existing facility may be used for the proposed project for a short period of time until completion of the new treatment facility. However if the new treatment facility is completed prior to the proposed project, the proposed project would be served from the new facility.

3.3 Financial Status and Users

The District has invested substantial time and effort into its planning efforts to ensure the financial success of the District. Primary planning tools for capital programs include a Master Plan, Capital Improvement Plan, and an Asset Management Plan. The primary planning tool for O&M program is the annual budget process. Revenue requirements identified through the planning processes are evaluated in an annual rate study. The District's approach to financial planning ensures that adequate revenues will be available to address both short term and long term system requirements.

3.3.1 Operating Revenues and Expenses

RWSD's operating revenues and expenses are evaluated annually in both the budget process and the rate study. Rates are established to ensure that operating revenues are adequate to cover operating expenses plus reserves. The District's financial policy sets a goal for contributions to reserves of 20% of expenses. Table 1 presents operating revenues vs. operating expenses for the years 2010 through 2013.

Table 1 – RWSD Operating Revenues vs. Operating Expenses

	Total Operating Revenues	Total Operating Expenditures	Balance*
2010	$2,840,910	$2,645,902	$195,008
2011	$2,852,650	$2,342,275	$510,375
2012	$3,090,595	$2,565,343	$525,252
2013	$2,840,769	$2,385,248	$455,521

*Available for Capital Projects/Reserves

Roxborough performs a rate evaluation on an annual basis, and has developed a rate structure that ensures adequate revenues under all water demand conditions. Fixed operating costs are covered with revenues from a flat fee. Variable operating costs are covered by a per 1,000 gallon usage charge. Surcharges are utilized to provide additional revenue for specific needs such as water supply, capital improvements and capital replacement.

Table 2 - Current Rates

2014 Water Rates	
Flat Fee and Surcharges	
Water Treatment and Distribution per EQR	$31.14
Water Supply and Plant Construction Fund per EQR	$27.00
Water System Replacement Fund per EQR	$2.00
Water Usage (per 1k gal.)	
0-20,000 (per 1k gal.)	$5.06
20,001-40,000 (per 1k gal.)	$6.54
40,001 & up (per 1k gal.)	$11.85

Water use by user type is presented in the following Table 3. It is important to note that due to the District's rate methodology and structure, varying water use does not impact RWSD's ability to collect adequate revenues.

Table 3 – Annual Consumption by User Class - Gallons

Year	Residential	Commercial	Irrigation	Hydrant
2013	261,536,000	6,455,000	5,227,000	1,987,000
2013	95%	2.4%	1.9%	.7%

3.3.2 Capital Revenues and Expenses

Typical revenue sources utilized by RWSD to meet capital requirements include fees, surcharges, property taxes and System Development Charges (SDCs). Fees and surcharges apply to all system users and are collected along with user charges to contribute to reserves or make debt service payments. Taxes are sometimes used to fund capital projects, if the District elects to finance the project using General Obligation Bonds. SDCs are fees paid by new customers to buy into existing systems and contribute to system expansion required by growth. The District's existing water fund currently has no debt, and as a result, no debt reserve obligations.

The borrower for the proposed project will be the Plum Valley Heights Subdistrict. The PVHSD currently includes the PVH Subdivision, and pending a successful election, will be expanded to include the Chatfield East, Chatfield Acres and Titan Road Industrial Park Subdivisions. The PVHSD has no existing debt, and all of the debt to be incurred by the Subdistrict will be associated with the proposed project. Repayment of debt by the Subdistrict will utilize revenue sources similar to those described above for RWSD.

3.4 Technical, Managerial, and Financial (TMF Capacity)

RWSD has provided water service to customers within the district boundary for over 40 years. During that time, the District has demonstrated a high level of Technical, Managerial and Financial capacity.

Technical – The district has a highly qualified and experienced staff that has consistently demonstrated the ability to operate a system that meets all Safe Drinking Water Act (SDWA) requirements.

Managerial – RWSD is a Title 32 District authorized to provide water service to its customers. The District is managed by a full time manager under the direction of its board of directors.

Financial – the District prepares annual budgets and audits in accordance with state statutes. In addition, the district regularly updates its planning documents including Master Plan, Asset Management Plan, and Capital Improvement Plan. These planning documents enable the District to develop a financial plan that addresses all of the District's needs, without shortfalls or unexpected financial requirements.

The system additions required to provide service under the proposed project would be operated and maintained by the District as part of its routine system operations and maintenance activities. The District currently provides water service to approximately 3,400 EQRs. The addition of 251 EQRs under the proposed project is not expected to create any TMF issues of concern.

The PVHSD is governed by the same board of directors as the RWSD, and day to day operation of the subdistrict will be accomplished by the existing RWSD staff. All of the TMF requirements associated with the proposed project will be handled by RWSD/PVHSD Board, and the existing RWSD staff. No new TMF capacity for either RWSD or PVHSD is required to support the proposed project.

4 PROJECT PURPOSE AND NEED

4.1 Health and Compliance

The purpose of this project is to provide permanent potable water service to four existing developments located near Santa Fe Drive (Hwy 85) and Titan Road in Douglas County. The areas to be served include:

- Plum Valley Heights – Residential
- Chatfield Acres – Residential
- Chatfield East – Residential
- Titan Road Industrial Park – Commercial/Light Industrial
-

All four developments are currently served by non-tributary wells. The three residential developments are served by individual wells, while Titan Road Industrial Park is served by two centralized wells and a small distribution system.

The existing developed areas in the vicinity of Santa Fe Drive (Hwy 85) and Titan Road were developed in the 1970s and 1980s based on non-tributary Denver Basin wells. The area is located near the margins of the Denver Basin aquifers, and in general, Denver Basin wells are not expected to provide a long term water supply for development in this area. The existing wells exhibit continuously dropping water levels, which has caused some existing wells to fail. The current solutions to failed wells, is redrilling (with no guarantee of long term performance), or hauling water.

Due to the expected limited life of Denver Basin wells in this area, Douglas County places significant limitations on new development in this area, and as a result there has been little development in the area in recent history.

The proposed project would provide a public health benefit by providing a permanent water supply to four existing developments that currently rely on non-renewable ground water.

Water service to the existing developments would be provided by RWSD, using its existing water treatment facility and the new distribution and storage infrastructure proposed as a part of this project. The District's existing system consistently meets all Primary and Secondary Drinking Water Standards, and has not identified any current or future risks that would significantly impact its ability to continue to meet drinking water standards. Likewise, the additional units to be added under the proposed project are not expected to have any effect on the District's ability to meet drinking water standards.

4.2 Security

The District performed a formal Vulnerability Assessment of its system in 2004, and identified mitigation measures to address identified risks. The District continues to evaluate and address

potential risks as a part of its ongoing planning processes and the new facilities constructed by the PVHSD will be included in future planning processes.

4.3 Operation and Maintenance

Operational Constraints

At this time, the District has identified no significant operational constraints that would impact either its ability to meet SDWA requirements or provide an adequate supply under all conditions. The additional number of units to be served by the proposed project is small in comparison to the number of existing units in the district, and providing service to the additional units is not expected to create any significant operational constraints.

Water Loss

The District maintains a consumption report to track water loss on a monthly basis. The average water loss of the existing distribution system is approximately 15%, as shown in the following Table 4.

Table 4 – RWSD Average Distribution System Loss

Year	Percentage
2009	17.8%
2010	16.9%
2011	14.4%
2012	14.4%
2013	15.8%
Average	15.9%

The District maintains an ongoing program to identify and repair/replace areas that exhibit excessive water loss. In 2010, the entire distribution system in the Pulte Subdivision was replaced at a cost of approximately $2M. To ensure accurate metering and billing of customers, the District also replaces customer meters on a recurring basis. The current meter replacement project was initiated in 2010 and is expected to be completed by the end of 2014.

Adequate Controls

Operation of the water system is accomplished via a SCADA system that provides operators with both on-site and remote control capability. All major water system components are controlled and/or monitored through the SCADA system including the water treatment plant, pump stations and storage tanks. The performance of the SCADA system is evaluated on an ongoing basis, and system components including sensing units, PLCs, computers and software are replace or updated on a recurring basis.

4.4 Growth

The District currently provides service to approximately 3400 EQRs, with a planned buildout of 3800 EQRs. There are no large undeveloped parcels in the District, and remaining development is expected to consist primarily of development of individual lots by individual owners. As a result, the growth rate to buildout is expected to be very low.

RWSD's growth was an average 40 units per year over a 10 year period and 7 units per year over the last 5 years.

The proposed project is intended to provide water service to existing developments that currently lack a central water system. The area to be served by the proposed project includes 251 EQRs, 228 of which are existing. The remaining EQRs are assigned to undeveloped, or infill lots within the added service area. The boundary for the expanded service area under the proposed project was established to include only the previously identified existing developments and to exclude any significant tracts of undeveloped property.

5 ASSESSMENT OF ALTERNATIVES

5.1 Description

5.1.1 Background

Plum Valley Heights (PVH) is an existing rural residential development that includes 29 residential lots ranging in size from approximately 4.5 ac to 7.5 ac. The area was developed in the 1980s based on individual nontributary wells. Water levels in the aquifers are dropping, and in recent years, a number of wells have failed and have had to be redrilled. As a result, PVH has been actively pursuing an alternate water source in the form centralized service from an existing provider. In its pursuit of an alternate source of water, PVH received assistance from Douglas County under the County's Water Alternatives Program. Initial assistance included funding for engineering feasibility studies. In 2013 PVH was included in the Roxborough Water and Sanitation District, but has not yet connected to the RWSD system.

In early 2014, after other communities contacted Douglas County about their Water needs, Douglas County began investigating the potential for having an existing entity provide water service to other existing and potential development in the area. In addition to performing engineering studies, DC began negotiations with the City of Aurora regarding the potential for obtaining a raw water supply from Aurora.

The County's studies identified RWSD as the most feasible service provider for the area due to its location, existing infrastructure, access to water supply conveyance systems, and willingness to participate in regional projects. Providing water service to this area of NWDC became a joint effort, with the water supply provided by the City of Aurora, treatment and distributions service provided by RWSD, and partial funding and other project facilitation provided by Douglas County.

5.1.2 Previous Studies and Alternatives

The area to be served by this project is located in close proximity to the service areas of three existing water service providers, including Roxborough Water and Sanitation District, Centennial Water and Sanitation District (CWSD), and Dominion Water and Sanitation District (DWSD). Douglas County studied the potential for service from all three existing providers and concluded that obtaining water service from RWSD was the preferred option.

DWSD was formed primarily to serve the Sterling Ranch (SR) development, and currently does not have any infrastructure in place, which would delay implementation of service. In addition, as a developing district, DWSD has not finalized its water supply or its cost for service, making planning and funding a project more challenging.

CWSD has substantial existing infrastructure in place with adequate capacity to serve the existing developments. However, CWSD does not have adequate water supply to serve the existing development, and would have to acquire additional water supply from the WISE project. Due to the cost and intermittent availability of WISE water, the CWSD became a less

desirable option as compared to the RWSD option. In addition, the WISE project is in the development stage, and it is unknown when WISE deliveries will commence.

RWSD has existing water supply and treatment infrastructure in place that could be used to serve the existing developments. RWSD receives its raw water supply from Aurora, and has the infrastructure in place to utilize the raw water to be provided by Aurora in support of the proposed project. In addition, RWSD has already included and agreed to serve PVH.

Based on its previous studies, the County identified RWSD as its preferred service provider for the existing developments.

5.1.3 Alternatives Considered

Alternatives were developed based on the geographic area to be served and the level of service to be provided. The Basic Service Alternative includes only domestic service to existing developments. The Basic Service Alternative does not include fire flow service or provide for expanded capacity to serve future development. Other alternatives increased the level of service to include fire flow service, and increased the area to be served to include other existing developments as well as future development in the area.

Under all of the action alternatives, RWSD would provide treatment service using its existing treatment facility. Except for the treatment facility, service to the proposed project area would not utilize the existing RWSD system. Service to the project area would be accomplished using new transmission, distribution, and storage facilities.

5.1.3.1 Alternative 1 – No Action

Under the No Action Alternative, no new facilities would be constructed, and for the immediate future, existing developments would continue to utilize individual non-tributary wells. Well failures due to declining water levels could be expected to continue, with the only immediate remedies being, drilling new wells or hauling water. Drilling new wells would be considered a temporary solution due to declining water levels in the aquifer. Permanent solutions could include committing permanently to hauling water, or developing another project to receive service from another service provider.

5.1.3.2 Alternative 2 – Basic Service to Existing Developments

The Basic Service Alternative provides for a domestic supply from RWSD to the existing developments. The service area for this alternative would be limited to the existing developments of Chatfield Acres, Chatfield East, Plum Valley Heights and Titan Road Industrial Park. The system would not be designed for future expansion with respect to either level of service or service area.

New infrastructure required for the Basic Service Alternative includes new pumping capacity at the RWSD water treatment facility; a transmission pipeline to convey treated water from the water treatment facility to storage and distribution; a potable water storage tank; internal

distribution systems for each of the residential developments; and connection to the existing TRIP system. The new system would be designed to deliver peak hour flow to the four development areas. The proposed layout for new infrastructure under Alternative 2 is presented in Figure 4.

Raw water would be delivered to the RWSD water treatment facility through Aurora's existing raw water delivery system. Since the source of water for the proposed project is the same as RWSD's existing water supply delivery of raw water and treatment would occur in conjunction with RWSD's normal water supply and treatment activities. New pumping capacity would be added to the treatment facility to convey treated water to the new water storage tank. Except for raw water delivery and water treatment, the proposed infrastructure would not be connected to RWSD's existing system.

5.1.3.3 Alternative 3 – Increased Service Area and Level of Service

Alternative 3 increased both the level of service and the service area. The level of service was increased to include a 1,500 gpm fire flow in addition to the domestic service provided by Alternative 2. Under Alternative 3, the proposed service area was also expanded to include additional existing and future development areas located to the south of the service area proposed under Alternative 2. The proposed layout for new infrastructure under Alternative 3 is presented in Figure 5.

Alternative 3 would be developed in phases, based on the rate of development within the proposed service area. The initial phase would provide service to the four existing developments served under Alternative 2. The second phase would provide service to existing developments such as the Louviers community, as well as future developments, all located to the south of the initial phase service area. Timing for the second phase would likely be dependent on the rate of future development.

Under Alternative 3, new infrastructure would be sized to provide both peak hour flow and maximum day plus a 1,500 gpm fire flow. The 1,500 gpm fire flow would provide adequate flow in the existing residential areas, but could potentially cause some limitations in future commercial development such as limits on type and size of construction, or requirements for installation of sprinkler systems.

Douglas County previously evaluated an increased level of service that provided for domestic flow and a 3,500 gpm fire flow. The increased fire flow capability would eliminate the potential restrictions on future development associated with a lower fire flow. Infrastructure requirements were similar to those under Alternative 3, but with increased capacity to accommodate the increased fire flow. The County's evaluation indicated that increasing fire flow capacity would significantly increase the cost of the project. It was determined that under current development conditions, the project was not feasible at the increased cost. As a result, this option was not considered to be a viable alternative and was not included in this report.

New infrastructure required for the initial phase of Alternative 3 includes similar components to those identified for Alternative 2 including new pumping capacity at the RWSD water treatment facility; a transmission pipeline to convey treated water from the water treatment facility to storage and distribution; a potable water storage tank; internal distribution systems for each of the residential developments; and connection to the existing TRIP system. The new system would be designed to provide domestic service and fire flows to the four development areas. Certain components of the initial phase would be oversized to facilitate expansion of the system during the second phase.

New infrastructure for the second phase of Alternative 3 would include additional pipelines to serve additional development areas, as well as increased pumping capacity at the water treatment facility. Storage capacity for the second phase would be constructed during the initial phase.

System operations under Alternative 3 would be the same as under Alternative 2. Raw water would be delivered to the RWSD water treatment facility through Aurora's existing raw water delivery system. Since the source of water for the proposed project is the same as RWSD's existing water supply delivery of raw water and treatment would occur in conjunction with RWSD's normal water supply and treatment activities. New pumping capacity would be added to the treatment facility to convey treated water to the new water storage tank. Except for raw water delivery and water treatment, the proposed infrastructure would not be connected to RWSD's existing system.

It should be noted that the water supply available under the Aurora 150 agreement provides an adequate supply for the initial phase only. Implementation of the second phase would require acquisition of additional water supply. It is unknown whether the additional supply could be obtained from the same source, and investigation of other sources may be required.

5.2 Design Criteria –Alternatives 2 & 3

Facilities required for service to the project area will be designed in accordance with RWSD Rules and Regulations. Design criteria for primary project components include:

Water Treatment Facility Capacity– Max. Day Demand

Transmission and Distribution Pipelines -w/o Fire Flow (Alternative 2)

- Maximum headloss – 2 ft/1,000 at peak hour flow

Transmission and Distribution Pipelines - w/Fire Flow (Alternative 3)

- Maximum Velocity – 10 fps @ Max Day plus Fire Flow
- Residual Pressure - 20 psi @ Max Day plus Fire Flow

Water Storage

- Without Fire Flow – Max Day (Alternative 2)
- With Fire Flow – Max Day plus fire storage per AWWA (Alternative 3)

5.3 Environmental Impacts

The primary impact of the No Action Alternative would be continued use of a non-renewable resource. The Denver Basin aquifers are considered to be non-recharging, and continued use of these aquifers will ultimately result in loss of the resource. In addition, prior to the permanent loss of the resource, it is anticipated that extracting water from these aquifers will become increasingly difficult as water levels recede. More wells will be required to extract the same quantity of water, resulting in more drilling activity. As an alternative to drilling additional wells, users may elect to haul water, resulting in traffic and fuel burning impacts.

Environmental impacts would be similar for all of the action alternatives. Implementation of the action alternatives will require construction of new pipelines and a new water storage tank. A general impact associated with construction activities is expected to be the potential for erosion and sediment impacts. These potential impacts will be managed by compliance with Douglas County's Grading, Erosion and Sediment Control program.

In addition to general construction impacts, potential impacts of construction of the action alternatives could include impacts to burrowing owl habitat to the east of the RWSD treatment facility, and a pipeline crossing of the wetland areas associated with Plum Creek. A survey will be required to determine whether burrowing owls are present in the vicinity of the proposed construction. If the survey determines that burrowing owls are present, pipeline routes may be adjusted to avoid the identified habitat, or construction activities may be initiated during the winter months when the owls are not present. Impacts to wetland and riparian areas near Plum Creek will be avoided by boring the pipeline under the creek.

5.4 Land Requirements

Easements will be required for new pipelines and the new water storage tank. The District will attempt to acquire all easements through negotiation, using its condemnation authority only if negotiations are unsuccessful.

Pipelines generally require a 30' wide easement, and less than 5 acres will be required for construction of the water tank, depending on the configuration of the site.

5.5 Construction Problems

The project is based on standard pipeline and tank construction, and no unusual construction problems are anticipated. To the extent possible, pipelines will be routed to reduce conflicts with existing natural features and existing facilities and infrastructure. When required, boring techniques will be used to further reduce conflicts between the proposed pipelines and existing facilities.

5.6 Operational Aspects

The proposed project is expected to have minimal impacts on system operations. Water will be treated as part of RWSDs normal treatment process, and due to the relatively low demand of the proposed project, few if any operational changes are expected at the water treatment facility.

The proposed project will be served by new pumping, transmission, distribution, and storage facilities, which will not be directly connected to the existing RWSD transmission and distribution systems. RWSD will be required to operate and maintain additional pumping, pipeline, and storage facilities, however due to the limited scope of the proposed project, the increase in operational demands are expected to be minimal

5.7 Cost Estimates

5.7.1 Alternative 1 – No Action

No immediate cost can be identified for the No Action alternative, since the failure rate for the existing wells cannot be predicted. No new infrastructure would be constructed and no fees would be required. Long term cost impacts could include the costs associated with redrilling existing wells, hauling water, potential loss of property value due to inadequate water supply and the cost to develop an alternate supply project.

5.7.2 Alternative 2 – Basic Service to Existing Developments

The estimated total project cost for Alternative 2 is $14.96M, which includes the following:

Water Supply	$2.47M
Infrastructure	$8.32M
Fees	$3.03M
Engineering	$1.14M
Total	$14.96M

Detailed cost estimates for Alternative 2 are presented in Appendix A.

5.7.3 Alternative 3 – Increased Service Area and Level of Service

The estimated total project cost for Alternative 3, to serve the 4 existing developments is $29.3M, which includes the following:

Water Supply	$5.6M
Infrastructure	$14.90M
Fees	$6.13M
Engineering	$2.73M
Total	$29.3M

Detailed cost estimates for Alternative 3 are presented in Appendix B.

5.8 Advantages/Disadvantages

5.8.1 Alternative 1 – No Action

The only potential advantages to the No Action Alternative would include no immediate cost to the existing developments and no immediate environmental impacts due to construction of new infrastructure. In both cases, these advantages would be temporary.

The primary disadvantage of the No Action Alternative is that it does not accomplish the goal of providing a renewable water supply to existing development. In addition to not accomplishing the primary goal, the No Action Alternative also results in the following immediate and future negative impacts:

- Continued demand on a non-renewable resource that will eventually be lost.
- Increased future expense to existing development to replace the groundwater supply. Any future solution is likely to cost more than one of the current potential solutions.
- Loss of property value due to inadequate water supply.

5.8.2 Alternative 2 – Basic Service to Existing Developments

Alternative 2 is the lower cost of the action alternatives and can be accomplished for a per EQR cost that appears to be acceptable to the customers to be served.

5.8.3 Alternative 3 – Increased Service Area and Level of Service

Alternative 3 also accomplishes the primary goal of providing a renewable water supply to existing development, reducing the demand on a limited resource. Like Alternative 2, Alternative 3 uses existing infrastructure including raw water delivery systems and treatment to the maximum extent possible, which increases the efficiency of the existing systems and reduces the new construction required.

Environmental impacts under Alternative 3 are expected to be similar to the potential impacts under Alternative 2. Again, impacts are expected to be relatively minor due to limited infrastructure requirements and the areas to be disturbed. The area to be disturbed under the first phase of Alternative 3 would be slightly larger due to construction of a larger water storage tank. Phase 2 of Alternative 3 would result in a significant increase in disturbed area due the larger service area. In both phases unavoidable impacts could be easily mitigated using standard construction techniques and controls.

Alternative 3 is the higher cost of the action alternatives due to the larger capacity required for most of the project components. As compared to Alternative 2, the majority of the pipelines would be upsized to carry fire flow, and the capacity of the water storage tank would be increased significant to provide the required fire storage.

To accommodate future growth, certain portions of the initial phase of Alternative 3 including the water storage tank and transmission pipelines would require oversizing. The cost of oversized components attributable to future growth is $3.4M. This cost would have to be carried by project participants, most likely Douglas County, until the costs could be recovered from future development.

The water supply could be obtained from Aurora for the proposed project is limited to 150 AF, which provides an adequate supply for the initial phase of Alternative 3, but additional supply would have to be acquired for the second phase.

6 SELECTED ALTERNATIVE

6.1 Justification of Selected Alternative

The selected alternative for this project is Alternative 2.

Alternative 2 accomplishes the primary goal of providing a renewable water supply to existing developments at the lowest cost of the alternatives considered. Alternative 2 also minimizes impacts by limiting the scope of the project to serve only existing development.

The No Action alternative was eliminated because it did not address the primary goal of the project, to provide a renewable water supply. This was viewed as deferring the problem, and in all likelihood making it more difficult to resolve in the future. The current opportunity provide a solution through the cooperative efforts of the City of Aurora, Douglas County, and Roxborough Water and Sanitation District which has not previously existed and is not likely to again in the future.

Alternative 3 was eliminated due to cost considerations and limited available water supply. It was recognized that providing a higher level of service in the form of fire flows would be a benefit to the existing developments, however the increased cost made it more likely that the project would lose support from customers, and from Douglas County who would likely have had to subsidize or carry at least a portion of the added cost. In addition complete development of Alternative 3 would require acquisition of additional water supply, which could be difficult.

6.2 Technical Description

The infrastructure required to provide service to the added units included in the selected alternative include both existing and new facilities. A map of major infrastructure requirements is presented in Figure 6. Preliminary pipeline sizes were developed based on hydraulic modeling of the backbone system. Results of hydraulic modeling are presented in Appendix C

Raw water delivery

The water supply for the proposed project will be provided by the City of Aurora. The City has extensive infrastructure for collecting and conveying its water supply, and the water supply for the Selected Alternative will be delivered through that system along with RWSDs water supply. Raw water is diverted from the South Platte River at Strontia Springs Reservoir and conveyed by tunnel to Aurora's Rampart Reservoir. Water is conveyed from Rampart Reservoir to the RWSD treatment plant by existing 42" and 54" transmission pipelines owned by Aurora.

The City of Aurora recently completed hydraulic modeling of its transmission pipelines to confirm that the pipelines have sufficient capacity to convey raw water to the RWSD water treatment facility.

Water treatment

The existing treatment facility has an overall capacity of 2.8 MGD based on the capacity of the existing filters. The maximum day demand on the facility by RWSD's existing customers is approximately 2.211MGD. The remaining capacity is adequate to serve the proposed project.

The existing treatment facility was originally constructed in 1958, and has been modified and upgraded numerous times. Due to its age, RWSD has determined that the facility is reaching its useful life and should be replaced. RWSD is currently designing a new treatment facility to replace the existing facility, and the design for the new facility has been submitted to CDPHE for design approval. The new facility will provide RWSD with 4 MGD of treatment capacity which will provide sufficient capacity for RWSD at buildout, including the proposed project.

Based the anticipated schedules for the proposed project and the new water treatment facility, it is anticipated that the existing facility may be used for the proposed project for a short period of time until completion of the new treatment facility. However if the new treatment facility is completed prior to the proposed project, the proposed project would be served from the new facility.

Transmission pipeline

A 6" transmission pipeline is planned to convey water from the water treatment facility to the proposed storage tank. In general, the transmission pipeline was sized to carry maximum day flow. Certain portions of the transmission pipeline will also be required to carry peak hour flows for a portion of the service area.

Easements or licenses will be required from a variety of owners for the transmission line. Based on the evaluation of the preliminary alignment of the pipeline, a tentative list of ownerships requiring easements/licenses includes Sterling Ranch, Douglas County, Union Pacific Railroad, Burlington Northern Santa Fe Railroad, Backcountry Association, Inc and the Colorado Department of Transportation. The final list of ownerships will be developed when the final pipeline alignment has been established.

The transmission pipeline will cross Plum Creek at a single location, currently planned near the intersection of Titan and Moore Roads. For ease of construction and to minimize disturbance of the creek, it is anticipated that pipeline will be installed in this area using directional drilling techniques.

The transmission pipeline will also cross South Santa Fe Drive and two existing railroad tracks. Crossings of these major transportation facilities will be bored, to eliminate disruption of these major transportation facilities.

Distribution Pipelines

Distribution pipelines will be constructed in each of the three residential developments. Pipeline sizes for distribution pipelines will be determined by hydraulic modeling performed as part of the design process.

It is anticipated that the majority of the distribution pipelines will be located in road Right-of-Way (ROW), adjacent to the pavement. Permits will be required for construction in the ROW. In some cases, existing facilities in the ROW may necessitate crossing private property with pipelines, in which case easements will be required.

Storage Tank

The storage tank capacity of 260,000 gallons provides storage for the estimated maximum day flow for the 251 EQRs to be served by the proposed project. If feasible, based on site considerations, the tank will be buried in accordance with Douglas County development guidelines. It is anticipated that the tank construction will be post-tensioned concrete.

The proposed location for the storage tank is to the east of the Chatfield East development, on open space property owned by Backcountry Association, Inc. An easement or ownership transfer will be required for the proposed site.

6.3 Environmental Review of Selected Alternative

General Construction Impacts

Implementation of the selected alternative will require construction of new pipelines and a new water storage tank. A general impact associated with construction activities is expected to be the potential for erosion and sediment impacts. These potential impacts will be managed by compliance with Douglas County's Grading, Erosion and Sediment Control (GESC) program. GESC requirements will be included in the construction documents, and initial and ongoing inspections of GESC items will be performed by both Douglas County and RWSD.

Specific Construction Impacts

In addition to general construction impacts, potential impacts resulting from construction of the selected alternative could include impacts to burrowing owl habitat to the east of the RWSD treatment facility, and the transmission pipeline crossing of the wetland areas associated with Plum Creek.

A survey will be required to determine whether burrowing owls are present in the vicinity of the proposed construction. If the survey determines that burrowing owls are present, pipeline routes may be adjusted to avoid the identified habitat, or construction activities may be initiated during the winter months (November 1 through March 14) when the owls are not present.

The area in and adjacent to Plum Creek is generally characterized as wetlands. In addition, the Plum Creek riparian area is presumed to be habitat for the endangered Preble's Meadow Jumping Mouse. The transmission pipeline will cross Plum Creek at a single location, currently planned near the intersection of Titan and Moore Roads. It is anticipated that directional drilling techniques will be utilized to cross under the creek, eliminating the need to disturb the majority of the riparian area and sensitive habitats.

Construction of the distribution system piping will occur in developed areas, primarily adjacent to roadways. No significant environmental issues are anticipated during construction of the distribution system piping.

The water storage tank site will be located at an elevation well away from flood plains and riparian areas and environmental issues are expected to be negligible. During the design process, the proposed tank site will be evaluated for other potential environmental issues.

6.4 Green Project Reserve

Green Project Reserve is not applicable to this project.

6.5 Costs

The estimated overall capital cost of the project of the selected alternative is $15M, including infrastructure, water supply, RWSD Fees, engineering, and financing fees. A summary of capital costs is presented in Table 5. Detailed cost estimates for the project are presented in Appendix A.

Table 5 – Alternative 2 Overall Project Cost

Shared Infrastructure	$4,322,100
Internal Infrastructure	$3,992,361
Financing Fees and Debt Reserve	$300,000
RWSD Fees	$2,698,250
Water Supply	$2,473,605
Election	$30,000
Engineering	$1,144,000
Total	**$14,906,316**

A capital improvement plan and estimated schedule of cash flow for the proposed capital improvements is presented in Appendix D. The estimated capital costs are based on the overall project costs summarized in Table 5. Estimated revenues are based on user charges, fees and taxes presented in Table 7. The schedule projects a positive balance through the year 2036.

Addition of the 251 EQRs to be served by the proposed project is not expected to have an appreciable impact on the District's O&M costs. Service to the additional units will be accomplished using the District's existing staff, management, and institutional infrastructure. Water treatment for the additional units will be accomplished in conjunction with RWSDs normal water treatment operations, and the additional infrastructure will be added to the District's routine maintenance. As compared to the District's existing operations and maintenance activities, the increased operational requirements related to the added units are expected to be negligible. No significant increase in the operational budget is anticipated and no increase in rates for O&M activities is planned as a result of the proposed project.

6.6 Project Implementation

Implementation of the proposed project involves a number of entities including Roxborough Water and Sanitation District, Douglas County, the City of Aurora, as well as the existing entities to be served. Some of the institutional arrangements required for the project have been completed, while other required actions are in progress, or are upcoming. The following list summarizes the status of the project and outlines the steps necessary for the project to proceed. All of the items listed must be completed in order for the project to proceed. If any one item cannot be completed, the project will not proceed.

- Water supply - The water supply agreement between RWSD and the City of Aurora has been completed and is included in Appendix E.
- Participation Agreement – The project participation agreement between RWSD and Douglas County is complete and is included in Appendix F.
- Inclusion of properties and authorization of debt
    - An election is scheduled for November 4, 2014 to authorize the inclusion of properties into the District and authorize the necessary debt including the method of repayment. Specific ballot questions address:
        - Authorization of inclusion of properties into the Roxborough Water and Sanitation District.
        - Authorization of inclusion of the properties into the Plum Valley Heights Subdistrict, which is required for financing and repayment of debt.
        - Authorization to incur debt.
        - Authorization for increased mill levy to repay debt.
    - All ballot questions must pass for the project to proceed.
- Funding of certain items by Douglas County per the Agreement.
- Approval of CWRPDA loan for infrastructure
- Approval of CWCB loan for water supply
- Acquisition of all required easements and ROW.
- Receipt of acceptable bids for construction of the project

A preliminary schedule for completion of the proposed project is presented in Figure 7. Design, Right of Way acquisition, approvals would commence early in 2015, with completion in the fall of 2015. Construction is expected to begin late in 2015 and continue into the early part of 2017.

The project will be paid for using a combination of loans, cash contributions by Douglas County, and direct payment of fees by the customers to be served by the project. Table 6 presents a breakdown of the sources of funds to be used for the project.

Table 6-Financing or Payment Responsibility

	Project Costs	CWPRDA Loan	CWCB Loan	Douglas County	RWSD
Shared Infrastructure	$4,322,100	$4,322,100			
Internal Infrastructure	$3,992,361	$877,900		$3,114,461	
Financing Fees and Debt Reserve	$300,000			$300,000	
RWSD Fees	$2,698,250				$2,698,250
Water Supply	$2,473,605		$2,226,245	$247,361	
Election	$30,000			$15,000	$15,000
Engineering	$1,144,000			$1,144,000	
Totals	**$14,960,316**	**$5,200,000**	**$2,226,245**	**$4,820,822**	**$2,713,250**

A loan will be requested from the Colorado Water Resources and Power Development Authority (CWRPDA) to pay for a portion of the infrastructure to be constructed. A second loan will be requested from the Colorado Water Conservation Board (CWCB) to pay for the water supply. Both loans will be taken out by the Plum Valley Heights Subdistrict of the Roxborough Water and Sanitation District. The CWRPDA loan will be repaid through property taxes. The CWCB loan will be repaid with a combination of property taxes and user surcharges. Douglas County will advance funds to pay for engineering and a portion of the construction. That portion of the funds associated with construction will be repaid out of connection fees. The portion of Douglas County fees associated with engineering will not be repaid. RWSD will initially defer the majority of its inclusion fees which would normally be due shortly after the vote to include, and allow those fees to be paid at the time of connection.

The cost of construction and all required fees will be paid for by the customers of the Plum Valley Heights Subdistrict. Table 7 presents the fees to be paid by PVHSD customers:

Table 7-Property Owner Impact

Description	Amount
RWSD Inclusion Fees (Partial, within 60 days of inclusion)-One Time Fee	$500.00
Tap Fees Upon Connection- One Time Fee	
RWSD	$7550.00
Douglas County	$14,649.00
Estimated Monthly Property Tax Increase	$126.00
Estimated Monthly Surcharge	$68.00
Service Line (Curb Stop to House)- One Time Fee	$2,000.00

The costs presented in Table 7 are specific to the project, and are in addition to the normal user charges applicable to all RWSD customers. Current RWSD user charges include a flat fee of $31.14/mo., consumption charge of $5.06/1000 gallons, and capital reserve surcharge of $2.00/mo.

A timeline for implementation of the project is presented in Figure 7. Design, permitting and ROW acquisition for the project is expected to take 6 -8 months and construction of required infrastructure is expected to take 18 – 24 months depending final project conditions.

Upon completion of the main project infrastructure, customers in the project area will have a maximum of 2 years to connect to the system.

The completed infrastructure improvements will initially be owned by the PVH Subdistrict, but will be operated and maintained by RWSD. Upon retirement of the CWRPDA loan, ownership of the infrastructure will be conveyed to RWSD.

Figures

LIST OF FIGURES

FIGURE 1

Legend

- FEMA Flood Plains 12/2013
- National Wet Areas Inventory 1979

N

S. SANTE FE DRIVE / HWY 85

W TITAN ROAD

SOUTH PLATTE RIVER

N. MOORE RD

PLUM CREEK

Chatfield Acres

Chatfield East

Titan Rd Industrial Park

Plum Valley Heights

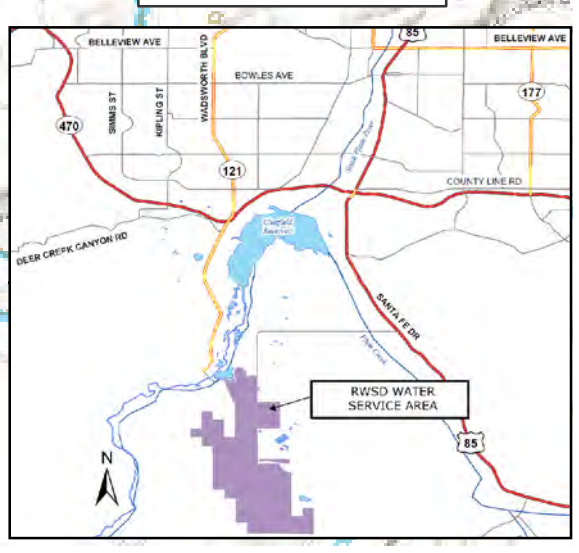
EXISTING RWSD WATER TREATMENT PLANT

Roxborough Park

RWSD WATER SERVICE AREA

Littleton

VICINITY MAP



TST

TST Infrastructure, LLC
Consulting Engineers

1 0.5 0 1 Miles

Date: 10/21/14

FIGURE 2

Legend

- Proposed Area
- FEMA Flood Plains 2013
- National Wet Areas Inventory 1979

Existing RWSD Facilities

- RWSD Transmission Main
- Pump Stations
- Tanks

N

TO AURORA WTP = 18 MILES

S. SANTE FE DRIVE | HWY 85

PROPOSED 260,000 GALLON BELOW GRADE CONCRETE WATER STORAGE TANK

Chatfield Acres

Chatfield East

Titan Rd Industrial Park

W TITAN ROAD

SOUTH PLATTE RIVER

N. MOORE RD

PROPOSED 6" TRANSMISSION PIPELINE

EXISTING RWSD WATER TREATMENT PLANT

Plum Valley Heights

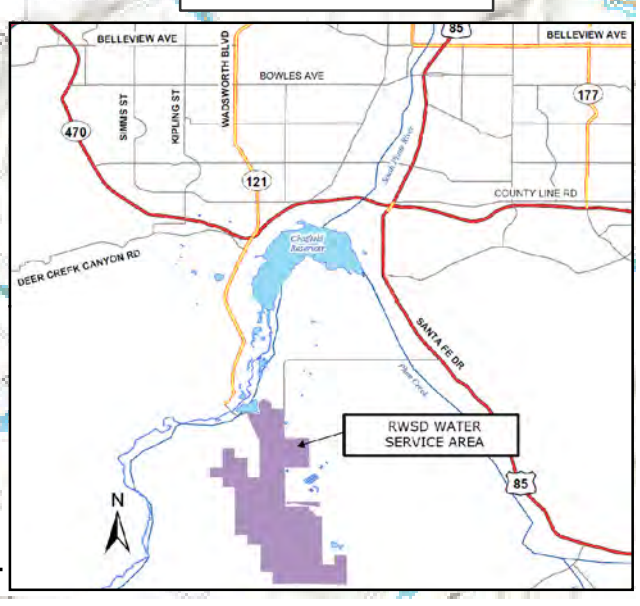
PLUM CREEK

AURORA RAW WATER PIPELINES

AURORA RAMPART RESERVOIR

RWSD WATER SERVICE AREA

VICINITY MAP

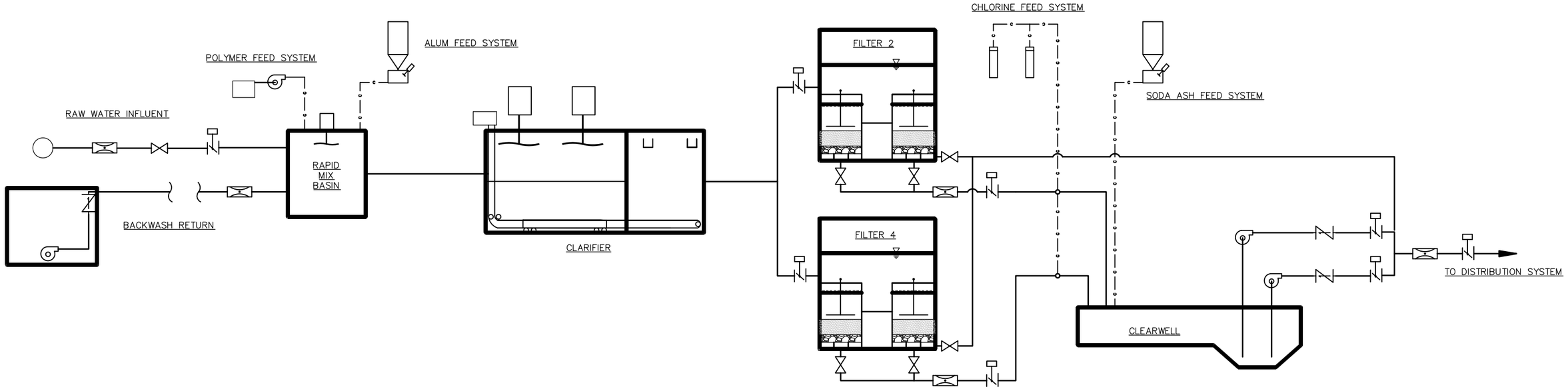


TST

TST Infrastructure, LLC
Consulting Engineers

1 0.5 0 1 Miles

Date: 10/21/14



H:\Drawings\Roxborough\001.266.00\PnID Existing Plant Expansion.dwg, 11X17_LANDSCAPE, 10/22/2014 3:47 PM

ROXBOROUGH WATER AND SANITATION DISTRICT

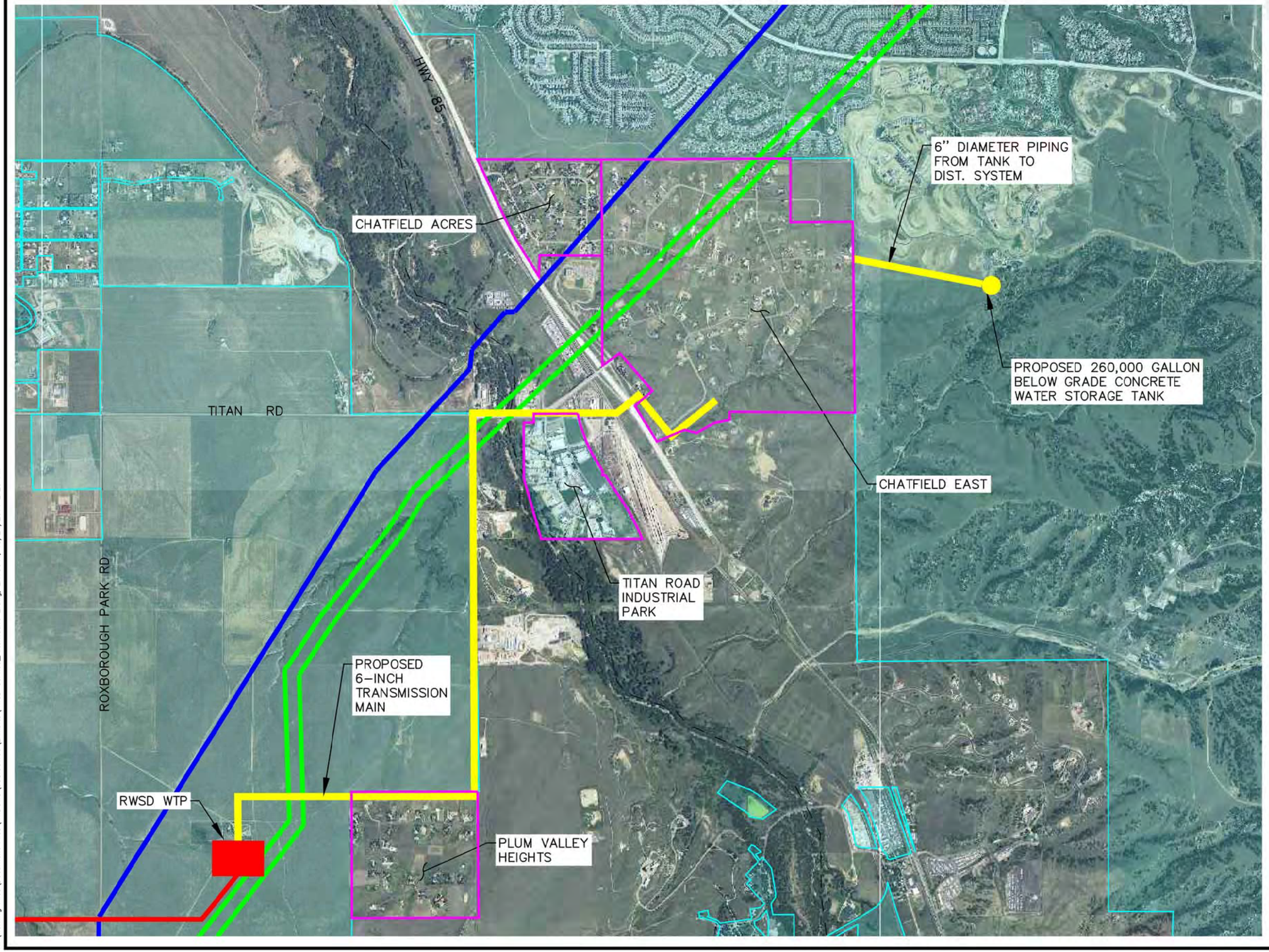
TST INFRASTRUCTURE, LLC
Consulting Engineers

EXISTING PROCESS SCHEMATIC

FIGURE 3

JOB NO. 001.266.00

DATE OCTOBER 22, 2014



LEGEND

- DENVER WATER CONDUITS
- AURORA WATER RAW WATER TRANSMISSION MAIN
- RWSD TREATED WATER MAIN
- PROPOSED TRANSMISSION MAIN AND WATER STORAGE TANK
- WATER SERVICE PROVIDER BOUNDARY
- ADDED WATER SERVICE AREA

FIGURE 4

ALTERNATIVE 2

ASSUMPTIONS:

- SERVICE TO CHATFIELD EAST, CHATFIELD ACRES, PLUM VALLEY HEIGHTS, AND TITAN ROAD INDUSTRIAL PARK (TRIP)
- TOTAL 251 EQRs
- NO FIRE FLOW
- 6" DIA TRANSMISSION MAIN
- 6" DIA PIPING FOR CHATFIELD EAST, CHATFIELD ACRES, AND NEW PIPING AT TITAN ROAD INDUSTRIAL PARK
- 260,000 GALLON BELOW GRADE CONCRETE WATER STORAGE TANK

1000 0 1000 2000
APPROX. SCALE 1"=2000'

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: 5/6/14

H:\Working Files\Document Files\NWDCWS\038.001.00\Exhibits\RWSD Service_Alternative 2.dwg, LAYOUT1, 10/24/2014 2:20 PM

CHATFIELD ACRES

CHATFIELD EAST

PROPOSED 12–INCH PIPING FROM TANK TO DIST. SYSTEM

PROPOSED 770,000 GALLON BELOW GRADE CONCRETE WATER STORAGE TANK

TITAN RD

ROXBOROUGH PARK RD

TITAN ROAD INDUSTRIAL PARK

PROPOSED 12–INCH TRANSMISSION MAIN SOUTHERN LOOP

PROPOSED 6–INCH TRANSMISSION MAIN

PROPOSED 12–INCH TRANSMISSION MAIN

RWSD WTP

PLUM VALLEY HEIGHTS

LEGEND

- DENVER WATER CONDUITS
- AURORA WATER RAW WATER TRANSMISSION MAIN
- RWSD TREATED WATER MAIN
- PROPOSED TRANSMISSION MAIN AND WATER STORAGE TANK (INITIAL PHASE)
- PROPOSED TRANSMISSION MAIN SOUTHERN LOOP (2ND PHASE)
- WATER SERVICE PROVIDER BOUNDARY
- ADDED WATER SERVICE AREA

FIGURE 5

ALTERNATIVE 3

ASSUMPTIONS:

- SERVICE TO CHATFIELD EAST, CHATFIELD ACRES, PLUM VALLEY HEIGHTS (PVH), TITAN ROAD INDUSTRIAL PARK (TRIP), AND FUTURE CUSTOMERS ALONG HWY 85
- TOTAL 570 EQRs
- FIRE FLOW FOR ALL 570 EQRs (1500 GPM)
- 6" DIA. TRANSMISSION MAIN FROM RWSD TO PVH
- 12" DIA TRANSMISSION MAIN FROM PVH TO CHATFIELD EAST
- 12" DIA TRANSMISSION MAIN LOOP COMPLETED (FROM CHATFIELD EAST AND CHATFIELD ACRES, SOUTH ON HWY 85, AND AROUND TO PLUM VALLEY HEIGHTS)
- 8" DIA PIPING FOR CHATFIELD EAST, CHATFIELD ACRES, AND NEW PIPING AT TITAN ROAD INDUSTRIAL PARK
- PROPOSED 770,000 GALLON BELOW GRADE CONCRETE WATER STORAGE TANK

N

1000 0 1000 2000

APPROX. SCALE 1"=2000'

TST

TST INFRASTRUCTURE, LLC
Consulting Engineers

DATE: 5/6/14

H:\Working Files\Document Files\NWDCWS\038.001.00\Exhibits\RWSD Service_Alternative 3.dwg, LAYOUT1, 10/24/2014 2:22 PM

FIGURE 6

Legend

- Proposed Area
- FEMA Flood Plains 2013
- National Wet Areas Inventory 1979

N

TO AURORA WTP = 18 MILES

PROPOSED 260,000 GALLON BELOW GRADE CONCRETE WATER STORAGE TANK

Chatfield Acres

Chatfield East

Titan Rd Industrial Park

Plum Valley Heights

W TITAN ROAD

S. SANTE FE DRIVE / HWY 85

N. MOORE RD

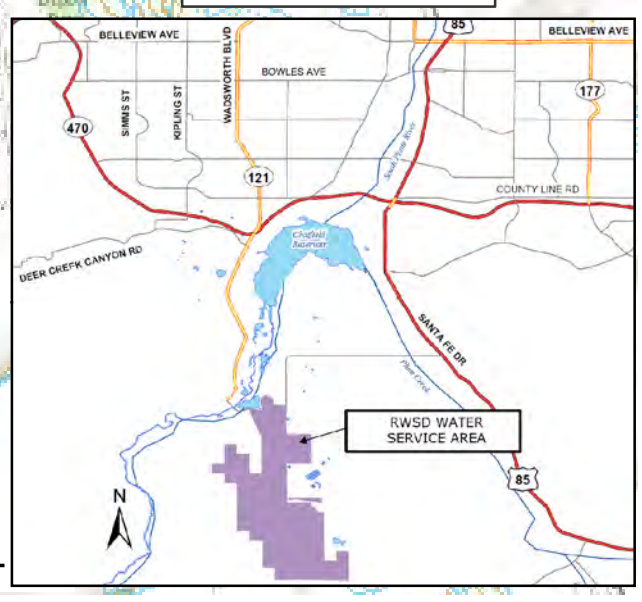
PLUMCREEK

AURORA RAW WATER PIPELINES

PROPOSED 6" TRANSMISSION PIPELINE

EXISTING RWSD WATER TREATMENT PLANT

VICINITY MAP



TST

TST Infrastructure, LLC
Consulting Engineers

0.5 0.25 0 0.5 Miles

Date: 10/21/14

FIGURE 7

Northwest Douglas County Water & Sanitation District Service Study
for Chatfield East/Acres, Titan Road Industrial Park, and Plum Valley Heights
Created by TST Infrastructure
Tuesday, June 17, 2014

Project Schedule

	2014				2015				2016				2017	
PROJECT PHASE	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
AURORA IGA (WATER)														
SELECT PROJECT OPTION														
RWSD/DC TERM SHEET														
RWSD/DC IGA														
INCLUSION														
PARTICIPANT COMMITMENT														
FINANCE PLAN														
EASEMENTS / ROW AQ.														
DESIGN ENGINEERING														
BID														
CONSTRUCTION														

Appendix A

Northwest Douglas County Water and Sanitation District
Service Study for Chatfield Acres, Chatfield East, Titan Road Industrial Park (TRIP), and Plum Valley Heights (PVH) - 251 EQR's
Cost Estimate (Unit Prices increased by 30%)
7-Jul-14

Summary of Project Costs - Option 1 Alternative 2

SHARED INFRASTRUCTURE

Description	Project Cost
Transmission Main	$ 2,566,500
Water Storage Tank	$ 1,755,600
Total	**$ 4,322,100**

INTERNAL INFRASTRUCTURE

Description	Project Cost
Chatfield Acres	$ 658,500
Chatfield East	$ 1,902,000
TRIP	$ 662,100
Plum Valley Heights	$ 769,761
Total	**$ 3,992,361**

ENGINEERING / ADMINISTRATIVE FEES

Description	Project Cost
Shared Infrastructure	$ 531,000
Chatfield Acres	$ 101,000
Chatfield East	$ 292,000
TRIP	$ 101,000
Plum Valley Heights	$ 119,000
Total	**$ 1,144,000**

RWSD FEES

Description	Project Cost
Chatfield Acres	$ 483,750
Chatfield East	$ 1,107,250
TRIP	$ 795,500
Plum Valley Heights	$ 311,750
Total	**$ 2,698,250**

WATER SUPPLY

Description	Project Cost
Chatfield Acres	$ 443,475
Chatfield East	$ 1,015,065
TRIP	$ 729,270
Plum Valley Heights	$ 285,795
Total	**$ 2,473,605**

TOTALS

Description	Project Cost
Shared Infrastructure	$ 4,322,100
Internal Infrastructure	$ 3,992,361
Financing and Election	$ 330,000
Engineering Fees	$ 1,144,000
RWSD Fees	$ 2,698,250
Water Supply	$ 2,473,605
Total	**$ 14,960,316**

Northwest Douglas County Water and Sanitation District
Service Study for Chatfield Acres, Chatfield East, Titan Road Industrial Park (TRIP), and Plum Valley Heights (PVH) - 251 EQR's
Cost Estimate (Unit Prices increased by 30%)
7-Jul-14

Option 1 Alternative 2
Shared Infrastructure Detailed Project Costs

Description	Quantity	Units	Unit Price	Cost
Transmission Main from RWSD WTP				
6-inch Pipeline	20,000	lf	$ 65	$ 1,300,000
Railroad Bore	150	lf	$ 390	$ 58,500
Highway 85 Bore	300	lf	$ 390	$ 117,000
Plum Creek Crossing	600	lf	$ 130	$ 78,000
Construction Subtotal				$ 1,553,500
Contingency (25%)				$ 389,000
Transmission Main from RWSD WTP Construction Total				***$ 1,942,500***
Easements / Land Acquisition	600,000	sf	$ 1.04	$ 624,000
Transmission Main from RWSD WTP Total				**$ 2,566,500**
Water Storage Tank				
260,000 gallon buried concrete water storage tank	260,000	gal	$ 4	$ 1,134,000
6-inch pipeline from tank to Dist. System	3,000	lf	$ 65	$ 195,000
Construction Subtotal				$ 1,329,000
Contingency (25%)				$ 333,000
Water Storage Tank Construction Total				***$ 1,662,000***
Easements / Land Acquisition	90,000	sf	$ 1.04	$ 93,600
Water Storage Tank Total				**$ 1,755,600**
Design & Construction Inspection Engineering	14.7	%		$ 531,000
Shared Infrastructure Engineering Total				**$ 531,000**
Shared Infrastructure Total				**$ 4,853,100**

Internal Infrastructure Detailed Project Costs

Description	Quantity	Units	Unit Price	Cost
Chatfield Acres Internal Infrastructure				
8,100 LF of 6-inch plus appurtenances*	1	ls	$ 526,500	$ 526,500
Construction Subtotal				$ 526,500
Contingency (25%)				$ 132,000
Chatfield Acres Internal Infrastructure Construction Total				**$ 658,500**
Design & Construction Inspection Engineering	15.3	%		$ 101,000
Chatfield Acres Internal Infrastructure Engineering Total				**$ 101,000**
Chatfield Acres Internal Infrastructure Total				**$ 759,500**
Chatfield East Internal Infrastructure				
23,400 LF of 6-inch plus appurtenances*	1	ls	$ 1,521,000	$ 1,521,000
Construction Subtotal				$ 1,521,000
Contingency (25%)				$ 381,000
Chatfield East Internal Infrastructure Construction Total				**$ 1,902,000**
Design & Construction Inspection Engineering	15.4	%		$ 292,000
Chatfield East Internal Infrastructure Engineering Total				**$ 292,000**
Chatfield East Internal Infrastructur Total				**$ 2,194,000**

* K/J 2013 Report quantity of piping used and the pricing for 8-inch to 6-inch was adjusted.

Titan Road Industrial Park Internal Infrastructure						
6" Pipes	2,000	lf	$	65	$	130,000
PRV Vault	2	ea	$	32,500	$	65,000
8" Valves	10	ea	$	6,500	$	65,000
Fire Hydrant Replacement	7	ea	$	7,800	$	54,600
Meter /Service Lines	33	ea	$	6,500	$	214,500
Construction Subtotal					$	529,100
Contingency (25%)					$	133,000
Titan Road Industrial Park Internal Infrastructure Construction Total					**$**	**662,100**
Design & Construction Inspection Engineering	15.3	%			$	101,000
Titan Road Industrial Park Internal Infrastructure Engineering Total					**$**	**101,000**
Titan Road Industrial Park Internal Infrastructure Total					**$**	**763,100**
Plum Valley Heights Internal Infrastructure (Using Modified Cost and Quantities from Mulhern MRE Report from Aug 2012)						
Pothole Maintenance	10	ea	$	415	$	4,147
4" PVC (C900 Class 150, DR 18) w/ bedding, backfill, etc.	8000	lf	$	59	$	468,000
4" Valve w/ epoxy coating, bedding, etc. (PVH S. Trail Rd.)	20	ea	$	1,463	$	29,250
Tie into existing 16" line at RWSD WTP	1	ea	$	10,400	$	10,400
2" Air Relief Valve	1	ea	$	2,981	$	2,981
2" Blowoff assembly	1	ea	$	2,981	$	2,981
12x8" Tee w/ Epoxy Coating	2	ea	$	1,105	$	2,210
6" 45 degree bend w/ Epoxy Coating	17	ea	$	520	$	8,840
6" 11.25 degree bend with Epoxy Coating	9	ea	$	520	$	4,680
Street Cut and Repair (15% of PVH Roads)	330	ton	$	130	$	42,900
Vehicle Construction Entrance	2	ea	$	3,250	$	6,500
Stabilized Staging Area	2500	sy	$	3.3	$	8,125
Silt Fence	4624	lf	$	2.0	$	9,017
Reinforced Rock Berm	250	lf	$	26	$	6,500
Concrete Washout Area	2	ea	$	715	$	1,430
Street Maintenance	1.5	lm	$	5,200	$	7,800
Construction Subtotal					$	615,761
Contingency (25%)					$	154,000
Plum Valley Heights Internal Infrastructure Construction Total					**$**	**769,761**
Design & Construction Inspection Engineering	15.5	%			$	119,000
Plum Valley Heights Internal Infrastructure Engineering Total					**$**	**119,000**
Plum Valley Heights Internal Infrastructure Total					**$**	**888,761**

RWSD Fees

Description	Quantity	Units	Unit Price	Cost
Chatfield Acres Fees				
Inclusion Fee (RWSD)	45	EQR	$ 3,200	$ 144,000
*RWSD System Development Charge**	45	EQR	$ 5,900	$ 265,500
*Water Cost***	45	EQR	$ -	$ -
Permit Fee	45	EQR	$ 1,650	$ 74,250
Chatfield Acres Fees Total				**$ 483,750**
Chatfield East Fees				
Inclusion Fee (RWSD)	103	EQR	$ 3,200	$ 329,600
*RWSD System Development Charge**	103	EQR	$ 5,900	$ 607,700
*Water Cost***	103	EQR	$ -	$ -
Permit Fee	103	EQR	$ 1,650	$ 169,950
Chatfield East Fees Total				**$ 1,107,250**
Titan Road Industrial Park Fees				
Inclusion Fee (RWSD)	74	EQR	$ 3,200	$ 236,800
*RWSD System Development Charge**	74	EQR	$ 5,900	$ 436,600
*Water Cost***	74	EQR	$ -	$ -
Permit Fee	74	EQR	$ 1,650	$ 122,100
Titan Road Industrial Park Fees Total				**$ 795,500**
Plum Valley Heights Fees				
Inclusion Fee (RWSD)	29	EQR	$ 3,200	$ 92,800
*RWSD System Development Charge**	29	EQR	$ 5,900	$ 171,100
*Water Cost***	29	EQR	$ -	$ -
Permit Fee	29	EQR	$ 1,650	$ 47,850
Plum Valley Heights Fees Total				**$ 311,750**
			RWSD FEES TOTAL	**$ 2,698,250**

*Note: Use of RWSD System Limited to WTP only.

**Note: Assumes costs associated with water supply paid by Douglas County

Water Supply Costs

Description	Quantity	Units	Unit Price	Cost
Chatfield Acres				
Water Supply	45	EQR	$ 9,855	$ 443,475
Chatfield Acres Water Supply Cost Total				**$ 443,475**
Chatfield East				
Water Supply	103	EQR	$ 9,855	$ 1,015,065
Chatfield East Water Supply Cost Total				**$ 1,015,065**
Titan Road Industrial Park				
Water Supply	74	EQR	$ 9,855	$ 729,270
Titan Road Industrial Park Water Supply Total				**$ 729,270**
Plum Valley Heights				
Water Supply	29	EQR	$ 9,855	$ 285,795
Plum Valley Heights Water Supply Total				**$ 285,795**
			WATER SUPPLY TOTAL	**$ 2,473,605**

References:

Chatfield East/Chatfield Acres Internal Infrastructure data from "Chatfield Acres and Chatfield East Subdivisions: Water System Study" (2012, Kennedy-Jenks)

Plum Valley Heights Internal Infrastructure data from "Northwest Douglas County Rural Water Alternatives" (2012, Mulhern MRE, Inc.)

Titan Road Industrial Complex data from "Titan Road Industrial Park Water System Study" (2000, Carroll & Lange, Inc.)

Appendix B

Northwest Douglas County Water and Sanitation District
Service Study for Chatfield Acres, Chatfield East, Titan Road Industrial Park (TRIP), Plum Valley Heights (PVH), and Future Customers - 570 EQR's
6-Jun-14

Summary of Project Costs - Option 2

SHARED INFRASTRUCTURE

Description	Project Cost
Transmission Main from RWSD WTP	$ 3,137,000
Transmission Main : Southern Loop	$ 5,202,000
Water Storage Tank	$ 3,372,000
Total	**$ 11,711,000**

INTERNAL INFRASTRUCTURE

Description	Project Cost
Chatfield Acres	$ 632,980
Chatfield East	$ 1,619,620
TRIP	$ 597,000
Plum Valley Heights	$ 347,288
Total	**$ 3,196,888**

ENGINEERING / ADMINISTRATIVE FEES

Description	Project Cost
Shared Infrastructure	$ 2,088,000
Chatfield Acres	$ 127,000
Chatfield East	$ 324,000
TRIP	$ 120,000
Plum Valley Heights	$ 69,000
Total	**$ 2,728,000**

RWSD FEES

Description	Project Cost
Chatfield Acres	$ 483,750
Chatfield East	$ 1,107,250
TRIP	$ 795,500
Plum Valley Heights	$ 311,750
Future Customers	$ 3,429,250
Total	**$ 6,127,500**

WATER SUPPLY

Description	Project Cost
Chatfield Acres	$ 443,475
Chatfield East	$ 1,015,065
TRIP	$ 729,270
Plum Valley Heights	$ 285,795
Future Customers	$ 3,143,745
Total	**$ 5,617,350**

TOTALS

Description	Project Cost
Shared Infrastructure	$ 11,711,000
Internal Infrastructure	$ 3,196,888
Engineering Fees	$ 2,728,000
RWSD Fees	$ 6,127,500
Water Supply	$ 5,617,350
Total	**$ 29,380,738**

Northwest Douglas County Water and Sanitation District
Service Study for Chatfield Acres, Chatfield East, Titan Road Industrial Park (TRIP), Plum Valley Heights (PVH), and Future Customers - 570 EQR's
6-Jun-14

Option 2
Shared Infrastructure Detailed Project Costs

Description	Quantity	Units		Unit Price		Cost
Transmission Main from RWSD WTP						
12-inch Pipeline from PVH to Chatfields	14,000	lf	$	110	$	1,540,000
6-inch Pipeline from RWSD WTP to PVH	6,000	lf	$	50	$	300,000
Railroad Bore	150	lf	$	500	$	75,000
Highway 85 Bore	300	lf	$	500	$	150,000
Plum Creek Crossing	600	lf	$	100	$	60,000
Construction Subtotal					$	2,125,000
Contingency (25%)					$	532,000
Transmission Main from RWSD WTP Construction Total					***$***	***2,657,000***
Easements / Land Acquisition	600,000	sf	$	0.80	$	480,000
Transmission Main from RWSD WTP Total					**$**	**3,137,000**
Transmission Main - Southern Loop						
12-inch Pipeline Southern Loop	30,000	lf	$	110	$	3,300,000
Railroad Bore	150	lf	$	500	$	75,000
Highway 85 Bore	300	lf	$	500	$	150,000
Plum Creek Crossing	600	lf	$	100	$	60,000
Construction Subtotal					$	3,585,000
Contingency (25%)					$	897,000
Transmission Main - Southern Loop Construction Total					***$***	***4,482,000***
Easements / Land Acquisition	900,000	sf	$	0.80	$	720,000
Transmission Main - Southern Loop Total					**$**	**5,202,000**
Water Storage Tank						
770,000 gallon buried concrete water storage tank	770,000	tank	$	3	$	2,310,000
12-inch pipeline from tank to Dist. System	3,000	lf	$	110	$	330,000
Construction Subtotal					$	2,640,000
Contingency (25%)					$	660,000
Water Storage Tank Construction Total					**$**	**3,300,000**
Easements / Land Acquisition	90,000	sf	$	0.80	$	72,000
Water Storage Tank Total					**$**	**3,372,000**
Design & Construction Inspection Engineering	19.1	%			$	2,088,000
Shared Infrastructure Engineering Total					**$**	**2,088,000**
Shared Infrastructure Grand Total					**$**	**13,799,000**

Internal Infrastructure Detailed Project Costs

Description	Quantity	Units		Unit Price		Cost
Chatfield Acres Internal Infrastructure						
8,100 LF of 8-inch plus appurtenances	1	ls	$	505,980	$	505,980
Construction Subtotal					$	505,980
Contingency (25%)					$	127,000
Chatfield Acres Internal Infrastructure Construction Total					**$**	**632,980**
Design & Construction Inspection Engineering	20.1	%			$	127,000
Chatfield Acres Internal Infrastructure Engineering Total					**$**	**127,000**
Chatfield Acres Internal Infrastructure Total					**$**	**759,980**
Chatfield East Internal Infrastructure						
23,400 LF of 8-inch plus appurtenances	1	ls	$	1,295,620	$	1,295,620
Construction Subtotal					$	1,295,620
Contingency (25%)					$	324,000
Chatfield East Internal Infrastructure Construction Total					**$**	**1,619,620**
Design & Construction Inspection Engineering	20	%			$	324,000
Chatfield East Internal Infrastructure Engineering Total					**$**	**324,000**
Chatfield East Internal Infrastructure Total					**$**	**1,943,620**

Titan Road Industrial Park Internal Infrastructure						
8" Pipes	2,000	lf	$	85	$	170,000
PRV Vault	2	ea	$	25,000	$	50,000
8" Valves	10	ea	$	5,000	$	50,000
Fire Hydrant Replacement	7	ea	$	6,000	$	42,000
Meter /Service Lines	33	ea	$	5,000	$	165,000
Construction Subtotal					$	477,000
Contingency (25%)					$	120,000
Titan Road Industrial Park Internal Infrastructure Construction Total					**$**	**597,000**
Design & Construction Inspection Engineering	20.1	%			$	120,000
Titan Road Industrial Park Internal Infrastructure Engineering Total					**$**	**120,000**
Titan Road Industrial Park Internal Infrastructure Total					**$**	**717,000**
Plum Valley Heights Internal Infrastructure (Using Cost and Quantities from Mulhern MRE Report from Aug 2012)						
Pothole Maintenance	10	ea	$	319	$	3,190
4" PVC (C900 Class 150, DR 18) w/ bedding, backfill, etc.	8000	lf	$	20	$	160,000
4" Valve w/ epoxy coating, bedding, etc. (PVH S. Trail Rd.)	20	ea	$	750	$	15,000
Tie into existing 16" line at RWSD WTP	1	ea	$	8,000	$	8,000
3/4" Service Taps (up to 100' LF)	29	ea	$	750	$	21,750
2" Air Relief Valve	1	ea	$	2,293	$	2,293
2" Blowoff assembly	1	ea	$	2,293	$	2,293
12x8" Tee w/ Epoxy Coating	2	ea	$	300	$	600
6" 45 degree bend w/ Epoxy Coating	17	ea	$	225	$	3,825
6" 11.25 degree bend with Epoxy Coating	9	ea	$	225	$	2,025
Street Cut and Repair (15% of PVH Roads)	330	ton	$	85	$	28,050
Vehicle Construction Entrance	2	ea	$	2,488	$	4,976
Stabilized Staging Area	2500	sy	$	2.5	$	6,250
Silt Fence	4624	lf	$	1.5	$	6,936
Reinforced Rock Berm	250	lf	$	20	$	5,000
Concrete Washout Area	2	ea	$	550	$	1,100
Street Maintenance	1.5	lm	$	4,000	$	6,000
Construction Subtotal					$	277,288
Contingency (25%)					$	70,000
Plum Valley Heights Internal Infrastructure Construction Total					**$**	**347,288**
Design & Construction Inspection Engineering	19.9	%			$	69,000
Plum Valley Heights Internal Infrastructure Engineering Total					**$**	**69,000**
Project Phase Grand Total					**$**	**416,288**

RWSD Fees

Description	Quantity	Units	Unit Price	Cost
Titan Road Industrial Park Fees				
Inclusion Fee (RWSD)	45	EQR	$ 3,200	$ 144,000
*RWSD System Development Charge**	45	EQR	$ 5,900	$ 265,500
*Water Cost***	45	EQR	$ -	$ -
Permit Fee	45	EQR	$ 1,650	$ 74,250
Titan Road Industrial Park Fees Total				**$ 483,750**
Chatfield East Fees				
Inclusion Fee (RWSD)	103	EQR	$ 3,200	$ 329,600
*RWSD System Development Charge**	103	EQR	$ 5,900	$ 607,700
*Water Cost***	103	EQR	$ -	$ -
Permit Fee	103	EQR	$ 1,650	$ 169,950
Chatfield East Fees Total				**$ 1,107,250**
Titan Road Industrial Park Fees				
Inclusion Fee (RWSD)	74	EQR	$ 3,200	$ 236,800
*RWSD System Development Charge**	74	EQR	$ 5,900	$ 436,600
*Water Cost***	74	EQR	$ -	$ -
Permit Fee	74	EQR	$ 1,650	$ 122,100
Titan Road Industrial Park Fees Total				**$ 795,500**
Plum Valley Heights Fees				
Inclusion Fee (RWSD)	29	EQR	$ 3,200	$ 92,800
*RWSD System Development Charge**	29	EQR	$ 5,900	$ 171,100
*Water Cost***	29	EQR	$ -	$ -
Permit Fee	29	EQR	$ 1,650	$ 47,850
Plum Valley Heights Fees Total				**$ 311,750**
Future Customers Fees				
Inclusion Fee (RWSD)	319	EQR	$ 3,200	$ 1,020,800
*RWSD System Development Charge**	319	EQR	$ 5,900	$ 1,882,100
*Water Cost***	319	EQR	$ -	$ -
Permit Fee	319	EQR	$ 1,650	$ 526,350
Future Customers Fees Total				**$ 3,429,250**
			TOTAL	**$ 6,127,500**

*Note: Use of RWSD System Limited to WTP only.

**Note: Assumes costs associated with water supply paid by Douglas County

Water Supply Costs

Description	Quantity	Units	Unit Price	Cost
Chatfield Acres				
Water Supply	45	EQR	$ 9,855	$ 443,475
Chatfield Acres Water Supply Cost Total				**$ 443,475**
Chatfield East				
Water Supply	103	EQR	$ 9,855	$ 1,015,065
Chatfield East Water Supply Cost Total				**$ 1,015,065**
Titan Road Industrial Park				
Water Supply	74	EQR	$ 9,855	$ 729,270
Titan Road Industrial Park Water Supply Total Total				**$ 729,270**
Plum Valley Heights				
Water Supply	29	EQR	$ 9,855	$ 285,795
Plum Valley Heights Water Supply Total				**$ 285,795**
Future Customers				
Water Supply	319	EQR	$ 9,855	$ 3,143,745
Future Customers Water Supply Cost Total				**$ 3,143,745**
			TOTAL	**$ 5,617,350**

References:

Chatfield East/Chatfield Acres Internal Infrastructure data from "Chatfield Acres and Chatfield East Subdivisions: Water System Study" (2012, Kennedy-Jenks)

Plum Valley Heights Internal Infrastructure data from "Northwest Douglas County Rural Water Alternatives" (2012, Mulhern MRE, Inc.)

Titan Road Industrial Complex data from "Titan Road Industrial Park Water System Study" (2000, Carroll & Lange, Inc.)

Appendix C

Alternative 2 – 251 EQR

NWDC Water Project
Alternative 2 (251 EQRs)
Overall System

Legend

- Junction
- Tank

Pipe

Diameter (in.)

- 6
- 10

N

0 0.05 0.1 0.2 0.3 0.4 Miles

TST

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 2 - Junction Report - Overall System

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	DEMAND: DEMAND1 (Real)	NODE: X (Real)	NODE: Y (Real)
1	RWSD-WTP	5,817.00	0.00	3,128,195.23	1,601,386.47
2	J12	5,813.00	0.00	3,128,177.00	1,602,109.56
3	PVHWEST	5,798.00	15.00	3,130,963.63	1,602,080.71
4	PVHEAST	5,706.00	14.00	3,133,637.24	1,602,063.35
5	J14	5,541.00	0.00	3,133,542.80	1,610,014.87
6	TRIPDEMANDNODE	5,562.00	74.00	3,135,035.86	1,610,006.19
7	J18	5,571.00	0.00	3,135,452.52	1,610,006.19
8	J20	5,610.00	0.00	3,136,407.38	1,609,988.82
9	J22	5,760.00	0.00	3,136,988.98	1,610,388.13
10	J24	5,646.00	0.00	3,137,492.45	1,609,632.92
11	J38	5,847.00	0.00	3,141,157.96	1,613,442.87
12	J40	5,853.00	0.00	3,140,720.46	1,613,338.70
13	J42	5,839.00	11.00	3,140,032.96	1,613,324.81
14	J44	5,833.00	0.00	3,139,803.79	1,613,262.31
15	J46	5,799.00	0.00	3,139,435.73	1,614,178.98
16	J48	5,781.00	0.00	3,139,421.85	1,614,567.87
17	J50	5,763.00	28.00	3,138,810.73	1,614,574.81
18	J52	5,769.00	0.00	3,137,845.46	1,614,859.54
19	J55	5,762.00	0.00	3,137,164.90	1,614,220.65
20	J56	5,751.00	0.00	3,137,116.29	1,613,588.70
21	J58	5,751.00	45.00	3,137,053.79	1,613,611.71
22	J65	5,664.00	0.00	3,136,741.29	1,612,636.01
23	J62	5,730.00	0.00	3,137,175.32	1,612,049.21
24	J64	5,751.00	0.00	3,137,512.12	1,612,155.11
25	J66	5,759.00	0.00	3,137,670.11	1,612,130.80
26	J68	5,763.00	0.00	3,137,838.51	1,612,016.22
27	J70	5,774.00	0.00	3,138,046.85	1,611,722.82
28	J72	5,773.00	0.00	3,137,960.04	1,611,620.39
29	J74	5,774.00	0.00	3,137,940.94	1,611,441.57
30	J76	5,736.00	0.00	3,138,254.31	1,610,821.78
31	J78	5,714.00	0.00	3,138,366.29	1,610,553.55
32	J80	5,663.00	0.00	3,138,751.71	1,610,402.51
33	J82	5,667.00	0.00	3,138,871.50	1,610,675.94
34	J85	5,701.00	6.00	3,139,674.45	1,610,995.39
35	J88	5,742.00	0.00	3,139,591.71	1,611,305.31
36	J90	5,757.00	0.00	3,139,775.14	1,611,835.67
37	J92	5,768.00	0.00	3,139,726.53	1,612,106.50
38	J96	5,789.00	0.00	3,140,250.84	1,612,408.58
39	J98	5,795.00	0.00	3,140,181.39	1,612,540.53
40	J100	5,805.00	0.00	3,140,052.92	1,612,696.78
41	J79	5,700.00	0.00	3,138,312.76	1,610,303.84
42	J106	5,784.00	0.00	3,140,165.72	1,612,247.15
43	J108	5,813.00	26.00	3,139,170.22	1,613,071.15
44	J110	5,774.00	32.00	3,138,961.89	1,612,081.56

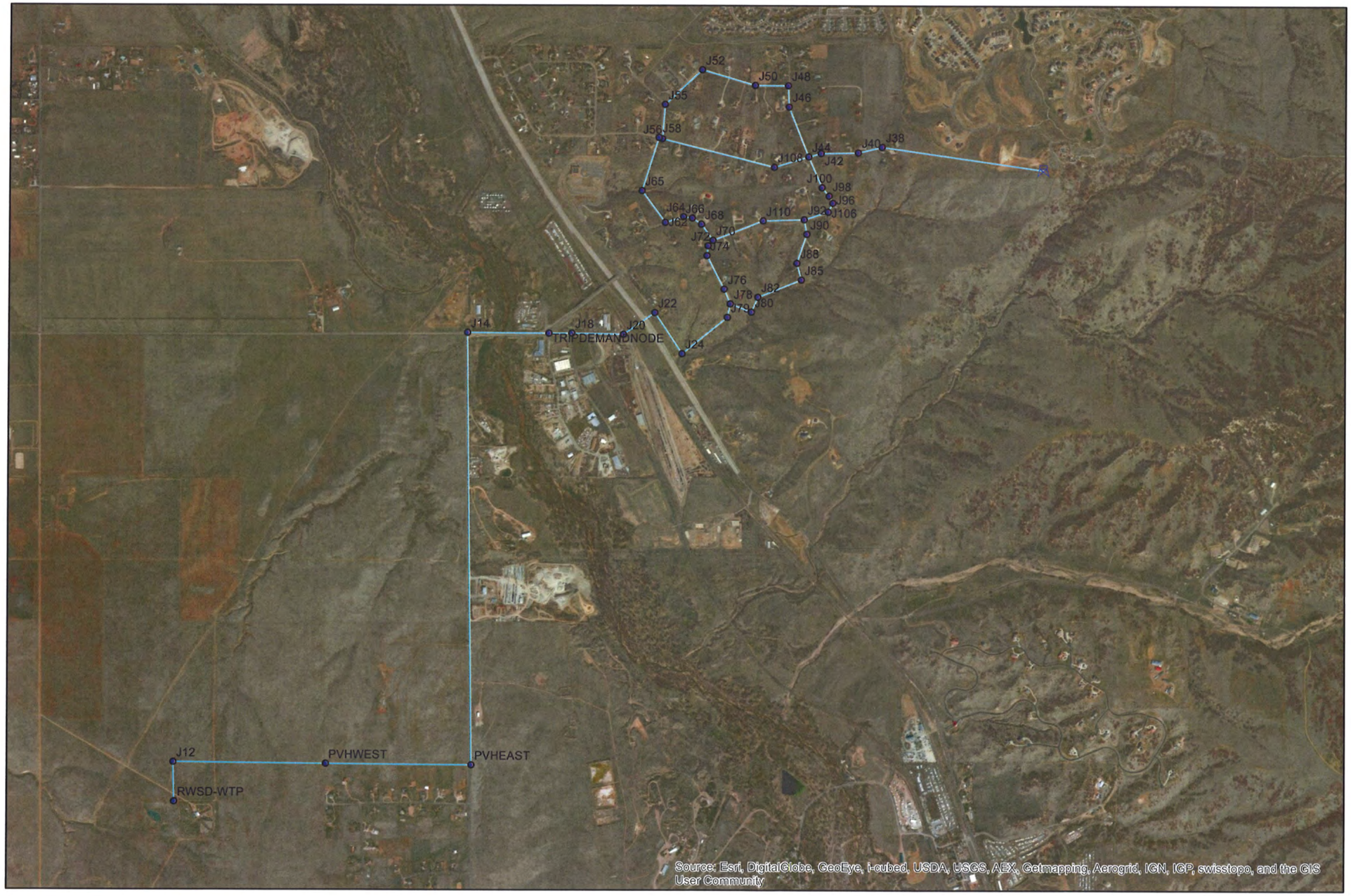
NWDC - Water Project - Alt. 2 - Pipe Report - Overall System

	PIPE: ID (Char)	PIPEHYD: LENGTH (Real)	PIPEHYD: DIAMETER (Real)	PIPEHYD: ROUGHNESS (Real)	PIPEHYD: MINORLOSS (Real)	PIPEHYD: TOTALIZER (Boolean)	PIPEHYD: CHK_VALVE (Boolean)	LINK: FROM (Char)	LINK: TO (Char)
1	P11	800.00	6.00	100.00	0.00	No	No	J12	RWSD-WTP
2	P13	2,800.00	6.00	100.00	0.00	No	No	J12	PVHWEST
3	P15	2,800.00	6.00	100.00	0.00	No	No	PVHWEST	PVHEAST
4	P17	8,500.00	6.00	100.00	0.00	No	No	PVHEAST	J14
5	P19	1,200.00	6.00	100.00	0.00	No	No	J14	TRIPDEMANDNODE
6	P21	300.00	6.00	100.00	0.00	No	No	TRIPDEMANDNODE	J18
7	P23	1,500.00	6.00	100.00	0.00	No	No	J18	J20
8	P25	1,000.00	6.00	100.00	0.00	No	No	J20	J22
9	P27	1,500.00	6.00	100.00	0.00	No	No	J22	J24
10	P45	388.00	10.00	100.00	0.00	No	No	J38	J40
11	P47	829.00	10.00	100.00	0.00	No	No	J40	J42
12	P49	100.00	10.00	100.00	0.00	No	No	J42	J44
13	P51	1,034.00	6.00	100.00	0.00	No	No	J44	J46
14	P53	362.00	6.00	100.00	0.00	No	No	J46	J48
15	P55	597.00	6.00	100.00	0.00	No	No	J48	J50
16	P57	996.00	6.00	100.00	0.00	No	No	J50	J52
17	P59	853.00	6.00	100.00	0.00	No	No	J52	J55
18	P61	623.00	6.00	100.00	0.00	No	No	J55	J56
19	P63	50.00	6.00	100.00	0.00	No	No	J56	J58
20	P65	1,015.00	6.00	100.00	0.00	No	No	J58	J65
21	P67	763.00	6.00	100.00	0.00	No	No	J65	J62
22	P69	352.00	6.00	100.00	0.00	No	No	J62	J64
23	P71	150.00	6.00	100.00	0.00	No	No	J64	J66
24	P73	230.00	6.00	100.00	0.00	No	No	J66	J68
25	P75	335.00	6.00	100.00	0.00	No	No	J68	J70
26	P77	100.00	6.00	100.00	0.00	No	No	J70	J72
27	P79	271.00	6.00	100.00	0.00	No	No	J72	J74
28	P81	557.00	6.00	100.00	0.00	No	No	J74	J76
29	P83	100.00	6.00	100.00	0.00	No	No	J76	J78
30	P85	300.00	6.00	100.00	0.00	No	No	J78	J80
31	P87	290.00	6.00	100.00	0.00	No	No	J80	J82
32	P89	801.00	6.00	100.00	0.00	No	No	J82	J85
33	P95	457.00	6.00	100.00	0.00	No	No	J88	J90
34	P97	335.00	6.00	100.00	0.00	No	No	J90	J92
35	P99	316.00	6.00	100.00	0.00	No	No	J92	J106
36	P103	288.00	6.00	100.00	0.00	No	No	J96	J98
37	P105	299.00	6.00	100.00	0.00	No	No	J98	J100
38	P107	547.00	6.00	100.00	0.00	No	No	J100	J44
39	P109	100.00	6.00	100.00	0.00	No	No	J78	J79
40	P111	1,100.00	6.00	100.00	0.00	No	No	J79	J24
41	P119	191.00	6.00	100.00	0.00	No	No	J106	J96
42	P121	383.00	6.00	100.00	0.00	No	No	J88	J85
43	P123	3,000.00	10.00	100.00	0.00	No	No	J38	TANK1
44	P125	590.00	6.00	100.00	0.00	No	No	J44	J108
45	P127	2,226.00	6.00	100.00	0.00	No	No	J108	J56
46	P129	792.00	6.00	100.00	0.00	No	No	J92	J110
47	P131	957.00	6.00	100.00	0.00	No	No	J110	J70

NWDC - Water Project - Alt. 2 - Tank Report - Overall System

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	TANKHYD: DIAMETER (Real)	NODE: X (Real)	NODE: Y (Real)
1	TANK1	5,960.00	1.00	24.25	24.25	42.72	3,144,126.36	1,613,017.42

NWDC Water Project
Alternative 2 (251 EQRs)
Static Flow Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.05 0.1 0.2 0.3 0.4 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 2 - Junction Report - Static Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,984.25	72.47	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,984.25	74.20	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	0.00	5,984.25	80.70	0.00	00:00	0.00	00:00
4	PVHEAST	5,706.00	0.00	5,984.25	120.57	0.00	00:00	0.00	00:00
5	J14	5,541.00	0.00	5,984.25	192.06	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	0.00	5,984.25	182.96	0.00	00:00	0.00	00:00
7	J18	5,571.00	0.00	5,984.25	179.06	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,984.25	162.16	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,984.25	97.17	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,984.25	146.56	0.00	00:00	0.00	00:00
11	J38	5,847.00	0.00	5,984.25	59.47	0.00	00:00	0.00	00:00
12	J40	5,853.00	0.00	5,984.25	56.87	0.00	00:00	0.00	00:00
13	J42	5,839.00	0.00	5,984.25	62.94	0.00	00:00	0.00	00:00
14	J44	5,833.00	0.00	5,984.25	65.54	0.00	00:00	0.00	00:00
15	J46	5,799.00	0.00	5,984.25	80.27	0.00	00:00	0.00	00:00
16	J48	5,781.00	0.00	5,984.25	88.07	0.00	00:00	0.00	00:00
17	J50	5,763.00	0.00	5,984.25	95.87	0.00	00:00	0.00	00:00
18	J52	5,769.00	0.00	5,984.25	93.27	0.00	00:00	0.00	00:00
19	J55	5,762.00	0.00	5,984.25	96.30	0.00	00:00	0.00	00:00
20	J56	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
21	J58	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
22	J65	5,664.00	0.00	5,984.25	138.76	0.00	00:00	0.00	00:00
23	J62	5,730.00	0.00	5,984.25	110.17	0.00	00:00	0.00	00:00
24	J64	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
25	J66	5,759.00	0.00	5,984.25	97.60	0.00	00:00	0.00	00:00
26	J68	5,763.00	0.00	5,984.25	95.87	0.00	00:00	0.00	00:00
27	J70	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00
28	J72	5,773.00	0.00	5,984.25	91.53	0.00	00:00	0.00	00:00
29	J74	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00
30	J76	5,736.00	0.00	5,984.25	107.57	0.00	00:00	0.00	00:00
31	J78	5,714.00	0.00	5,984.25	117.10	0.00	00:00	0.00	00:00
32	J80	5,663.00	0.00	5,984.25	139.20	0.00	00:00	0.00	00:00
33	J82	5,667.00	0.00	5,984.25	137.46	0.00	00:00	0.00	00:00
34	J85	5,701.00	0.00	5,984.25	122.73	0.00	00:00	0.00	00:00
35	J88	5,742.00	0.00	5,984.25	104.97	0.00	00:00	0.00	00:00
36	J90	5,757.00	0.00	5,984.25	98.47	0.00	00:00	0.00	00:00
37	J92	5,768.00	0.00	5,984.25	93.70	0.00	00:00	0.00	00:00
38	J96	5,789.00	0.00	5,984.25	84.60	0.00	00:00	0.00	00:00
39	J98	5,795.00	0.00	5,984.25	82.00	0.00	00:00	0.00	00:00
40	J100	5,805.00	0.00	5,984.25	77.67	0.00	00:00	0.00	00:00
41	J79	5,700.00	0.00	5,984.25	123.17	0.00	00:00	0.00	00:00
42	J106	5,784.00	0.00	5,984.25	86.77	0.00	00:00	0.00	00:00
43	J108	5,813.00	0.00	5,984.25	74.20	0.00	00:00	0.00	00:00
44	J110	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00

NWDC - Water Project - Alt. 2 - Pipe Report - Static Demand

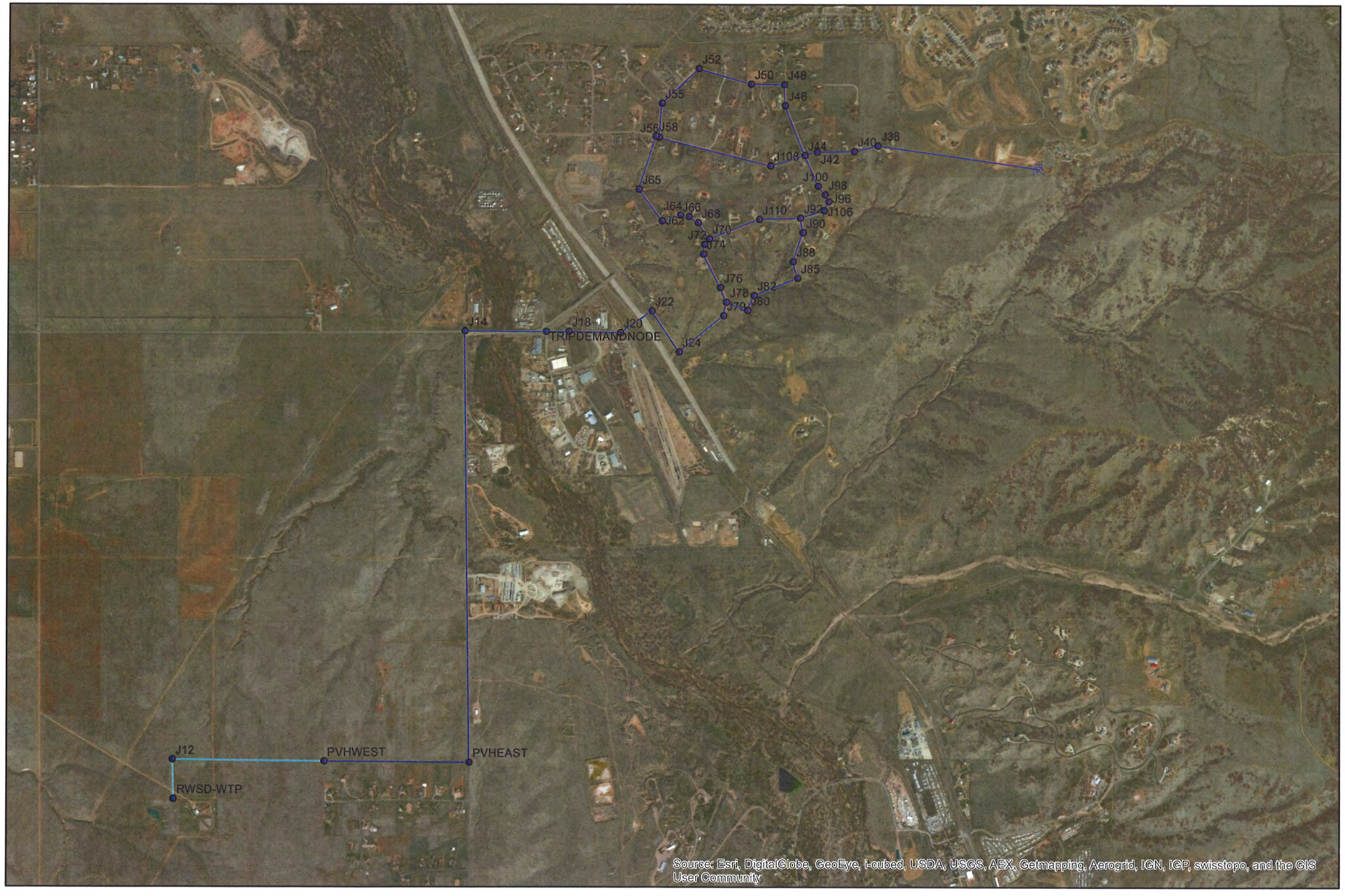
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
4	P17	PVHEAST	J14	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
5	P19	J14	TRIPDEMANDNODE	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
6	P21	TRIPDEMANDNODE	J18	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
7	P23	J18	J20	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
8	P25	J20	J22	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
9	P27	J22	J24	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
10	P45	J38	J40	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
11	P47	J40	J42	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
12	P49	J42	J44	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
13	P51	J44	J46	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
14	P53	J46	J48	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
15	P55	J48	J50	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
16	P57	J50	J52	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
17	P59	J52	J55	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
18	P61	J55	J56	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
19	P63	J56	J58	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
20	P65	J58	J65	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
21	P67	J65	J62	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
22	P69	J62	J64	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
23	P71	J64	J66	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
24	P73	J66	J68	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
25	P75	J68	J70	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
26	P77	J70	J72	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
27	P79	J72	J74	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
28	P81	J74	J76	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
29	P83	J76	J78	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
30	P85	J78	J80	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
31	P87	J80	J82	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
32	P89	J82	J85	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
33	P95	J88	J90	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
34	P97	J90	J92	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
35	P99	J92	J106	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
36	P103	J96	J98	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
37	P105	J98	J100	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
38	P107	J100	J44	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
39	P109	J78	J79	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
40	P111	J79	J24	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
41	P119	J106	J96	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
42	P121	J88	J85	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
43	P123	J38	TANK1	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
44	P125	J44	J108	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
45	P127	J108	J56	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
46	P129	J92	J110	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
47	P131	J110	J70	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00

NWDC - Water Project - Alt. 2 - Tank Report - Static Demand

	TANK: ID (Char)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	42.72	24.25	1.00	24.25	0.00	5,984.25	100.00	24.25	0.00	00:00	0.00	00:00

NWDC Water Project
Alternative 2 (251 EQRs)
Average Day Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.05 0.1 0.2 0.3 0.4 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 2 - Junction Report - Avg Day Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,982.57	71.74	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,982.57	73.48	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	4.08	5,982.57	79.98	4.08	00:00	4.08	00:00
4	PVHEAST	5,706.00	3.81	5,982.59	119.84	3.81	00:00	3.81	00:00
5	J14	5,541.00	0.00	5,982.72	191.40	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	20.13	5,982.73	182.30	20.13	00:00	20.13	00:00
7	J18	5,571.00	0.00	5,982.78	178.43	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,983.02	161.63	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,983.19	96.71	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,983.43	146.21	0.00	00:00	0.00	00:00
11	J38	5,847.00	0.00	5,984.04	59.38	0.00	00:00	0.00	00:00
12	J40	5,853.00	0.00	5,984.01	56.77	0.00	00:00	0.00	00:00
13	J42	5,839.00	2.99	5,983.96	62.81	2.99	00:00	2.99	00:00
14	J44	5,833.00	0.00	5,983.95	65.41	0.00	00:00	0.00	00:00
15	J46	5,799.00	0.00	5,983.89	80.11	0.00	00:00	0.00	00:00
16	J48	5,781.00	0.00	5,983.86	87.90	0.00	00:00	0.00	00:00
17	J50	5,763.00	7.62	5,983.83	95.68	7.62	00:00	7.62	00:00
18	J52	5,769.00	0.00	5,983.81	93.08	0.00	00:00	0.00	00:00
19	J55	5,762.00	0.00	5,983.79	96.10	0.00	00:00	0.00	00:00
20	J56	5,751.00	0.00	5,983.78	100.86	0.00	00:00	0.00	00:00
21	J58	5,751.00	12.24	5,983.77	100.86	12.24	00:00	12.24	00:00
22	J65	5,664.00	0.00	5,983.74	138.54	0.00	00:00	0.00	00:00
23	J62	5,730.00	0.00	5,983.71	109.93	0.00	00:00	0.00	00:00
24	J64	5,751.00	0.00	5,983.70	100.83	0.00	00:00	0.00	00:00
25	J66	5,759.00	0.00	5,983.70	97.36	0.00	00:00	0.00	00:00
26	J68	5,763.00	0.00	5,983.69	95.62	0.00	00:00	0.00	00:00
27	J70	5,774.00	0.00	5,983.68	90.85	0.00	00:00	0.00	00:00
28	J72	5,773.00	0.00	5,983.67	91.28	0.00	00:00	0.00	00:00
29	J74	5,774.00	0.00	5,983.66	90.84	0.00	00:00	0.00	00:00
30	J76	5,736.00	0.00	5,983.62	107.30	0.00	00:00	0.00	00:00
31	J78	5,714.00	0.00	5,983.62	116.83	0.00	00:00	0.00	00:00
32	J80	5,663.00	0.00	5,983.63	138.93	0.00	00:00	0.00	00:00
33	J82	5,667.00	0.00	5,983.64	137.20	0.00	00:00	0.00	00:00
34	J85	5,701.00	1.63	5,983.66	122.48	1.63	00:00	1.63	00:00
35	J88	5,742.00	0.00	5,983.68	104.72	0.00	00:00	0.00	00:00
36	J90	5,757.00	0.00	5,983.70	98.23	0.00	00:00	0.00	00:00
37	J92	5,768.00	0.00	5,983.71	93.47	0.00	00:00	0.00	00:00
38	J96	5,789.00	0.00	5,983.79	84.40	0.00	00:00	0.00	00:00
39	J98	5,795.00	0.00	5,983.83	81.82	0.00	00:00	0.00	00:00
40	J100	5,805.00	0.00	5,983.87	77.51	0.00	00:00	0.00	00:00
41	J79	5,700.00	0.00	5,983.60	122.88	0.00	00:00	0.00	00:00
42	J106	5,784.00	0.00	5,983.76	86.56	0.00	00:00	0.00	00:00
43	J108	5,813.00	7.07	5,983.89	74.05	7.07	00:00	7.07	00:00
44	J110	5,774.00	8.70	5,983.68	90.86	8.70	00:00	8.70	00:00

NWDC - Water Project - Alt. 2 - Pipe Report - Avg Day Demand

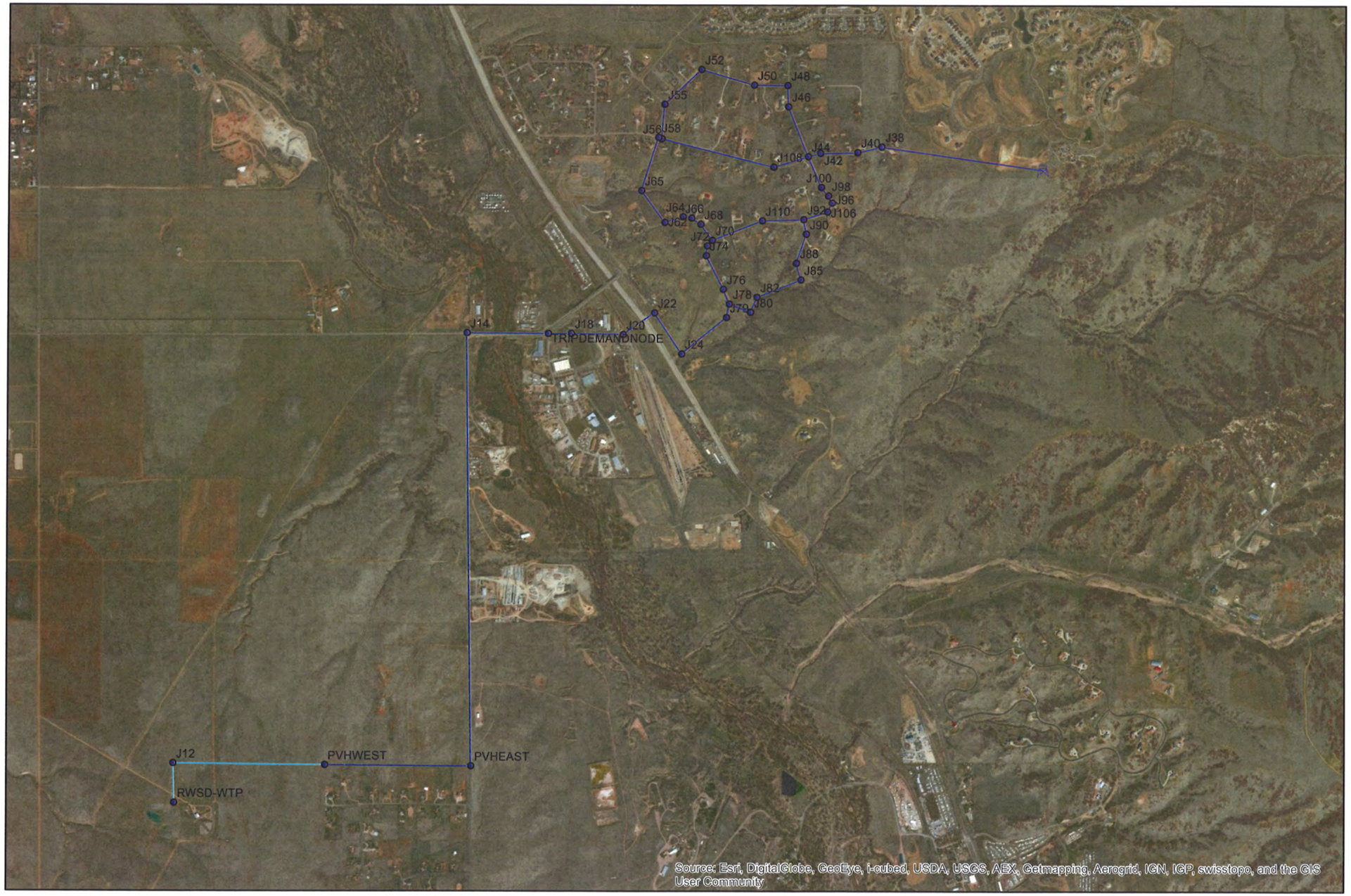
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-4.08	0.05	0.01	0.00	Open	4.08	00:00	4.08	00:00
4	P17	PVHEAST	J14	-7.89	0.09	0.13	0.02	Open	7.89	00:00	7.89	00:00
5	P19	J14	TRIPDEMANDNODE	-7.89	0.09	0.02	0.02	Open	7.89	00:00	7.89	00:00
6	P21	TRIPDEMANDNODE	J18	-28.02	0.32	0.05	0.16	Open	28.02	00:00	28.02	00:00
7	P23	J18	J20	-28.02	0.32	0.24	0.16	Open	28.02	00:00	28.02	00:00
8	P25	J20	J22	-28.02	0.32	0.16	0.16	Open	28.02	00:00	28.02	00:00
9	P27	J22	J24	-28.02	0.32	0.24	0.16	Open	28.02	00:00	28.02	00:00
10	P45	J38	J40	68.28	0.28	0.03	0.07	Open	68.28	00:00	68.28	00:00
11	P47	J40	J42	68.28	0.28	0.06	0.07	Open	68.28	00:00	68.28	00:00
12	P49	J42	J44	65.28	0.27	0.01	0.06	Open	65.28	00:00	65.28	00:00
13	P51	J44	J46	16.74	0.19	0.06	0.06	Open	16.74	00:00	16.74	00:00
14	P53	J46	J48	16.74	0.19	0.02	0.06	Open	16.74	00:00	16.74	00:00
15	P55	J48	J50	16.74	0.19	0.04	0.06	Open	16.74	00:00	16.74	00:00
16	P57	J50	J52	9.13	0.10	0.02	0.02	Open	9.13	00:00	9.13	00:00
17	P59	J52	J55	9.13	0.10	0.02	0.02	Open	9.13	00:00	9.13	00:00
18	P61	J55	J56	9.13	0.10	0.01	0.02	Open	9.13	00:00	9.13	00:00
19	P63	J56	J58	24.12	0.27	0.01	0.12	Open	24.12	00:00	24.12	00:00
20	P65	J58	J65	11.88	0.13	0.03	0.03	Open	11.88	00:00	11.88	00:00
21	P67	J65	J62	11.88	0.13	0.02	0.03	Open	11.88	00:00	11.88	00:00
22	P69	J62	J64	11.88	0.13	0.01	0.03	Open	11.88	00:00	11.88	00:00
23	P71	J64	J66	11.88	0.13	0.00	0.03	Open	11.88	00:00	11.88	00:00
24	P73	J66	J68	11.88	0.13	0.01	0.03	Open	11.88	00:00	11.88	00:00
25	P75	J68	J70	11.88	0.13	0.01	0.03	Open	11.88	00:00	11.88	00:00
26	P77	J70	J72	16.13	0.18	0.01	0.06	Open	16.13	00:00	16.13	00:00
27	P79	J72	J74	16.13	0.18	0.02	0.06	Open	16.13	00:00	16.13	00:00
28	P81	J74	J76	16.13	0.18	0.03	0.06	Open	16.13	00:00	16.13	00:00
29	P83	J76	J78	16.13	0.18	0.01	0.06	Open	16.13	00:00	16.13	00:00
30	P85	J78	J80	-11.89	0.13	0.01	0.03	Open	11.89	00:00	11.89	00:00
31	P87	J80	J82	-11.89	0.13	0.01	0.03	Open	11.89	00:00	11.89	00:00
32	P89	J82	J85	-11.89	0.13	0.03	0.03	Open	11.89	00:00	11.89	00:00
33	P95	J88	J90	-13.52	0.15	0.02	0.04	Open	13.52	00:00	13.52	00:00
34	P97	J90	J92	-13.52	0.15	0.01	0.04	Open	13.52	00:00	13.52	00:00
35	P99	J92	J106	-26.48	0.30	0.05	0.15	Open	26.48	00:00	26.48	00:00
36	P103	J96	J98	-26.48	0.30	0.04	0.14	Open	26.48	00:00	26.48	00:00
37	P105	J98	J100	-26.48	0.30	0.04	0.15	Open	26.48	00:00	26.48	00:00
38	P107	J100	J44	-26.48	0.30	0.08	0.14	Open	26.48	00:00	26.48	00:00
39	P109	J78	J79	28.02	0.32	0.02	0.16	Open	28.02	00:00	28.02	00:00
40	P111	J79	J24	28.02	0.32	0.18	0.16	Open	28.02	00:00	28.02	00:00
41	P119	J106	J96	-26.48	0.30	0.03	0.14	Open	26.48	00:00	26.48	00:00
42	P121	J88	J85	13.52	0.15	0.02	0.04	Open	13.52	00:00	13.52	00:00
43	P123	J38	TANK1	-68.28	0.28	0.21	0.07	Open	68.28	00:00	68.28	00:00
44	P125	J44	J108	22.06	0.25	0.06	0.10	Open	22.06	00:00	22.06	00:00
45	P127	J108	J56	14.99	0.17	0.11	0.05	Open	14.99	00:00	14.99	00:00
46	P129	J92	J110	12.96	0.15	0.03	0.04	Open	12.96	00:00	12.96	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
47	P131	J110	J70	4.25	0.05	0.00	0.00	Open	4.25	00:00	4.25	00:00

NWDC - Water Project - Alt. 2 - Tank Report - Avg Day Demand

	TANK: ID (Char)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	42.72	24.25	1.00	24.25	-68.28	5,984.25	100.00	24.25	-68.28	00:00	-68.28	00:00

NWDC Water Project
Alternative 2 (251 EQRs)
Max Day Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.05 0.1 0.2 0.3 0.4 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 2 - Junction Report - Max Day Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,974.42	68.21	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,974.42	69.94	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	10.60	5,974.42	76.44	10.60	00:00	10.60	00:00
4	PVHEAST	5,706.00	9.90	5,974.49	116.34	9.90	00:00	9.90	00:00
5	J14	5,541.00	0.00	5,975.26	188.16	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	52.32	5,975.36	179.11	52.32	00:00	52.32	00:00
7	J18	5,571.00	0.00	5,975.65	175.33	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,977.06	159.05	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,978.00	94.46	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,979.42	144.47	0.00	00:00	0.00	00:00
11	J38	5,847.00	0.00	5,983.03	58.94	0.00	00:00	0.00	00:00
12	J40	5,853.00	0.00	5,982.87	56.27	0.00	00:00	0.00	00:00
13	J42	5,839.00	7.78	5,982.53	62.19	7.78	00:00	7.78	00:00
14	J44	5,833.00	0.00	5,982.49	64.78	0.00	00:00	0.00	00:00
15	J46	5,799.00	0.00	5,982.12	79.35	0.00	00:00	0.00	00:00
16	J48	5,781.00	0.00	5,981.99	87.09	0.00	00:00	0.00	00:00
17	J50	5,763.00	19.80	5,981.77	94.79	19.80	00:00	19.80	00:00
18	J52	5,769.00	0.00	5,981.65	92.14	0.00	00:00	0.00	00:00
19	J55	5,762.00	0.00	5,981.55	95.13	0.00	00:00	0.00	00:00
20	J56	5,751.00	0.00	5,981.48	99.87	0.00	00:00	0.00	00:00
21	J58	5,751.00	31.81	5,981.44	99.85	31.81	00:00	31.81	00:00
22	J65	5,664.00	0.00	5,981.25	137.46	0.00	00:00	0.00	00:00
23	J62	5,730.00	0.00	5,981.10	108.80	0.00	00:00	0.00	00:00
24	J64	5,751.00	0.00	5,981.03	99.67	0.00	00:00	0.00	00:00
25	J66	5,759.00	0.00	5,981.00	96.19	0.00	00:00	0.00	00:00
26	J68	5,763.00	0.00	5,980.96	94.44	0.00	00:00	0.00	00:00
27	J70	5,774.00	0.00	5,980.90	89.65	0.00	00:00	0.00	00:00
28	J72	5,773.00	0.00	5,980.86	90.07	0.00	00:00	0.00	00:00
29	J74	5,774.00	0.00	5,980.77	89.59	0.00	00:00	0.00	00:00
30	J76	5,736.00	0.00	5,980.58	105.98	0.00	00:00	0.00	00:00
31	J78	5,714.00	0.00	5,980.55	115.49	0.00	00:00	0.00	00:00
32	J80	5,663.00	0.00	5,980.61	137.62	0.00	00:00	0.00	00:00
33	J82	5,667.00	0.00	5,980.66	135.91	0.00	00:00	0.00	00:00
34	J85	5,701.00	4.24	5,980.82	121.24	4.24	00:00	4.24	00:00
35	J88	5,742.00	0.00	5,980.91	103.52	0.00	00:00	0.00	00:00
36	J90	5,757.00	0.00	5,981.02	97.07	0.00	00:00	0.00	00:00
37	J92	5,768.00	0.00	5,981.10	92.34	0.00	00:00	0.00	00:00
38	J96	5,789.00	0.00	5,981.53	83.42	0.00	00:00	0.00	00:00
39	J98	5,795.00	0.00	5,981.78	80.93	0.00	00:00	0.00	00:00
40	J100	5,805.00	0.00	5,982.03	76.71	0.00	00:00	0.00	00:00
41	J79	5,700.00	0.00	5,980.45	121.52	0.00	00:00	0.00	00:00
42	J106	5,784.00	0.00	5,981.37	85.52	0.00	00:00	0.00	00:00
43	J108	5,813.00	18.38	5,982.14	73.29	18.38	00:00	18.38	00:00
44	J110	5,774.00	22.62	5,980.92	89.66	22.62	00:00	22.62	00:00

NWDC - Water Project - Alt. 2 - Pipe Report - Max Day Demand

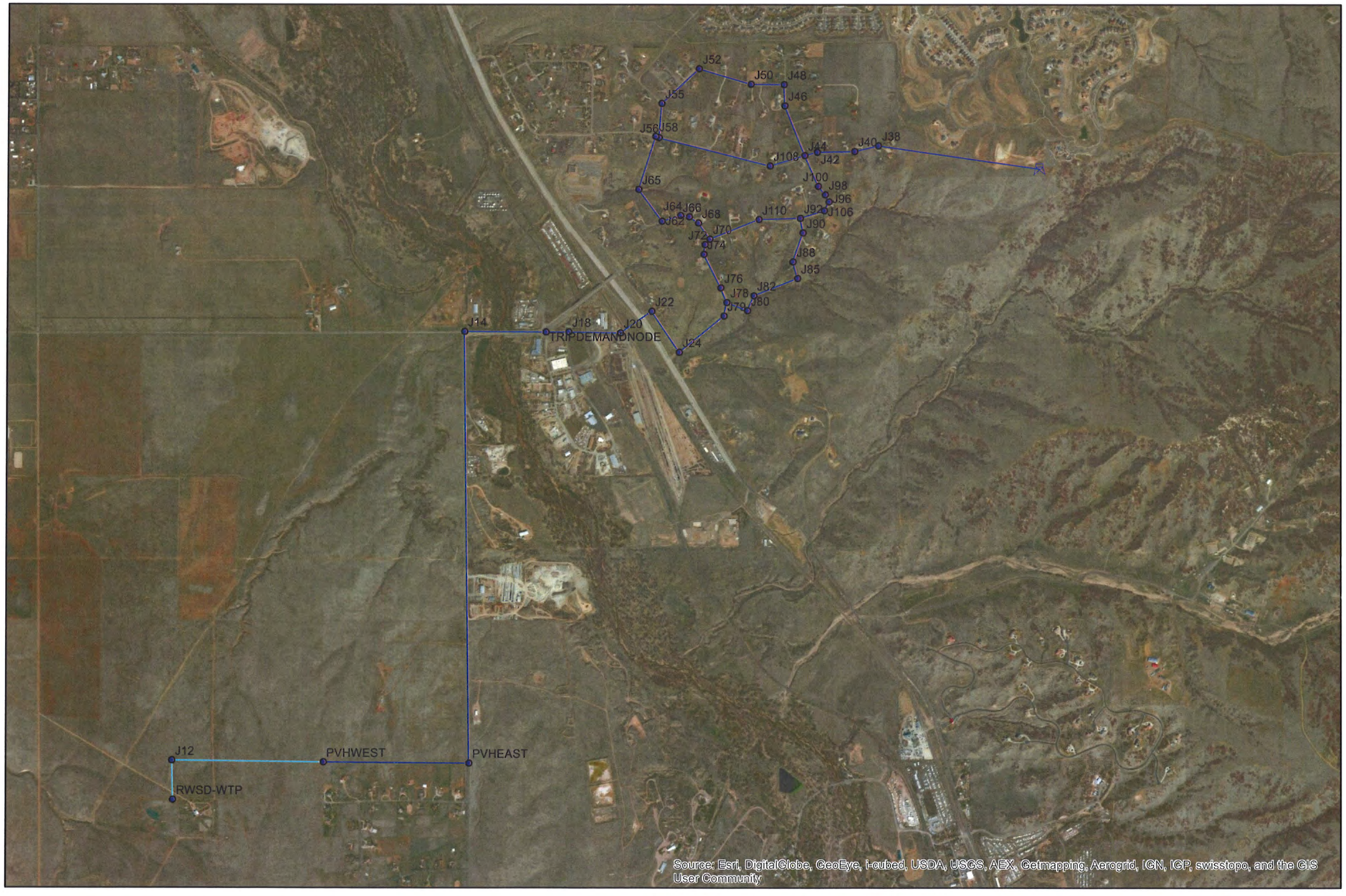
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-10.61	0.12	0.07	0.03	Open	10.61	00:00	10.61	00:00
4	P17	PVHEAST	J14	-20.51	0.23	0.77	0.09	Open	20.51	00:00	20.51	00:00
5	P19	J14	TRIPDEMANDNODE	-20.51	0.23	0.11	0.09	Open	20.51	00:00	20.51	00:00
6	P21	TRIPDEMANDNODE	J18	-72.83	0.83	0.28	0.94	Open	72.83	00:00	72.83	00:00
7	P23	J18	J20	-72.83	0.83	1.41	0.94	Open	72.83	00:00	72.83	00:00
8	P25	J20	J22	-72.83	0.83	0.94	0.94	Open	72.83	00:00	72.83	00:00
9	P27	J22	J24	-72.83	0.83	1.41	0.94	Open	72.83	00:00	72.83	00:00
10	P45	J38	J40	177.46	0.72	0.16	0.41	Open	177.46	00:00	177.46	00:00
11	P47	J40	J42	177.46	0.72	0.34	0.41	Open	177.46	00:00	177.46	00:00
12	P49	J42	J44	169.68	0.69	0.04	0.38	Open	169.68	00:00	169.68	00:00
13	P51	J44	J46	43.52	0.49	0.38	0.36	Open	43.52	00:00	43.52	00:00
14	P53	J46	J48	43.52	0.49	0.13	0.36	Open	43.52	00:00	43.52	00:00
15	P55	J48	J50	43.52	0.49	0.22	0.36	Open	43.52	00:00	43.52	00:00
16	P57	J50	J52	23.73	0.27	0.12	0.12	Open	23.73	00:00	23.73	00:00
17	P59	J52	J55	23.73	0.27	0.10	0.12	Open	23.73	00:00	23.73	00:00
18	P61	J55	J56	23.73	0.27	0.07	0.12	Open	23.73	00:00	23.73	00:00
19	P63	J56	J58	62.69	0.71	0.04	0.71	Open	62.69	00:00	62.69	00:00
20	P65	J58	J65	30.88	0.35	0.20	0.19	Open	30.88	00:00	30.88	00:00
21	P67	J65	J62	30.88	0.35	0.15	0.19	Open	30.88	00:00	30.88	00:00
22	P69	J62	J64	30.88	0.35	0.07	0.19	Open	30.88	00:00	30.88	00:00
23	P71	J64	J66	30.88	0.35	0.03	0.19	Open	30.88	00:00	30.88	00:00
24	P73	J66	J68	30.88	0.35	0.04	0.19	Open	30.88	00:00	30.88	00:00
25	P75	J68	J70	30.88	0.35	0.06	0.19	Open	30.88	00:00	30.88	00:00
26	P77	J70	J72	41.93	0.48	0.03	0.34	Open	41.93	00:00	41.93	00:00
27	P79	J72	J74	41.93	0.48	0.09	0.34	Open	41.93	00:00	41.93	00:00
28	P81	J74	J76	41.93	0.48	0.19	0.34	Open	41.93	00:00	41.93	00:00
29	P83	J76	J78	41.93	0.48	0.03	0.34	Open	41.93	00:00	41.93	00:00
30	P85	J78	J80	-30.89	0.35	0.06	0.19	Open	30.89	00:00	30.89	00:00
31	P87	J80	J82	-30.89	0.35	0.06	0.19	Open	30.89	00:00	30.89	00:00
32	P89	J82	J85	-30.89	0.35	0.15	0.19	Open	30.89	00:00	30.89	00:00
33	P95	J88	J90	-35.14	0.40	0.11	0.24	Open	35.14	00:00	35.14	00:00
34	P97	J90	J92	-35.14	0.40	0.08	0.24	Open	35.14	00:00	35.14	00:00
35	P99	J92	J106	-68.81	0.78	0.27	0.85	Open	68.81	00:00	68.81	00:00
36	P103	J96	J98	-68.81	0.78	0.24	0.85	Open	68.81	00:00	68.81	00:00
37	P105	J98	J100	-68.81	0.78	0.25	0.85	Open	68.81	00:00	68.81	00:00
38	P107	J100	J44	-68.81	0.78	0.46	0.85	Open	68.81	00:00	68.81	00:00
39	P109	J78	J79	72.83	0.83	0.09	0.94	Open	72.83	00:00	72.83	00:00
40	P111	J79	J24	72.83	0.83	1.04	0.94	Open	72.83	00:00	72.83	00:00
41	P119	J106	J96	-68.81	0.78	0.16	0.85	Open	68.81	00:00	68.81	00:00
42	P121	J88	J85	35.14	0.40	0.09	0.24	Open	35.14	00:00	35.14	00:00
43	P123	J38	TANK1	-177.46	0.72	1.22	0.41	Open	177.46	00:00	177.46	00:00
44	P125	J44	J108	57.35	0.65	0.36	0.60	Open	57.35	00:00	57.35	00:00
45	P127	J108	J56	38.96	0.44	0.66	0.30	Open	38.96	00:00	38.96	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
46	P129	J92	J110	33.68	0.38	0 18	0.23	Open	33.68	00:00	33.68	00:00
47	P131	J110	J70	11.06	0.13	0 03	0.03	Open	11.06	00:00	11.06	00:00

NWDC - Water Project - Alt. 2 - Tank Report - Max Day Demand

	TANK: ID (Char)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	42.72	24.25	1.00	24.25	-177.46	5,984.25	100.00	24.25	-177.46	00:00	-177.46	00:00

NWDC Water Project
Alternative 2 (251 EQRs)
Peak Hour Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.05 0.1 0.2 0.3 0.4 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 2 - Junction Report - Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,963.43	63.45	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,963.43	65.18	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	15.90	5,963.43	71.68	15.90	00:00	15.90	00:00
4	PVHEAST	5,706.00	14.84	5,963.59	111.61	14.84	00:00	14.84	00:00
5	J14	5,541.00	0.00	5,965.21	183.81	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	78.44	5,965.44	174.81	78.44	00:00	78.44	00:00
7	J18	5,571.00	0.00	5,966.04	171.17	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,969.03	155.57	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,971.03	91.44	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,974.02	142.13	0.00	00:00	0.00	00:00
11	J38	5,847.00	0.00	5,981.66	58.35	0.00	00:00	0.00	00:00
12	J40	5,853.00	0.00	5,981.33	55.60	0.00	00:00	0.00	00:00
13	J42	5,839.00	11.66	5,980.61	61.36	11.66	00:00	11.66	00:00
14	J44	5,833.00	0.00	5,980.53	63.93	0.00	00:00	0.00	00:00
15	J46	5,799.00	0.00	5,979.74	78.31	0.00	00:00	0.00	00:00
16	J48	5,781.00	0.00	5,979.46	85.99	0.00	00:00	0.00	00:00
17	J50	5,763.00	29.68	5,979.00	93.59	29.68	00:00	29.68	00:00
18	J52	5,769.00	0.00	5,978.75	90.89	0.00	00:00	0.00	00:00
19	J55	5,762.00	0.00	5,978.54	93.83	0.00	00:00	0.00	00:00
20	J56	5,751.00	0.00	5,978.38	98.53	0.00	00:00	0.00	00:00
21	J58	5,751.00	47.70	5,978.31	98.49	47.70	00:00	47.70	00:00
22	J65	5,664.00	0.00	5,977.89	136.01	0.00	00:00	0.00	00:00
23	J62	5,730.00	0.00	5,977.58	107.28	0.00	00:00	0.00	00:00
24	J64	5,751.00	0.00	5,977.44	98.12	0.00	00:00	0.00	00:00
25	J66	5,759.00	0.00	5,977.38	94.62	0.00	00:00	0.00	00:00
26	J68	5,763.00	0.00	5,977.29	92.85	0.00	00:00	0.00	00:00
27	J70	5,774.00	0.00	5,977.15	88.02	0.00	00:00	0.00	00:00
28	J72	5,773.00	0.00	5,977.08	88.43	0.00	00:00	0.00	00:00
29	J74	5,774.00	0.00	5,976.88	87.91	0.00	00:00	0.00	00:00
30	J76	5,736.00	0.00	5,976.48	104.20	0.00	00:00	0.00	00:00
31	J78	5,714.00	0.00	5,976.41	113.70	0.00	00:00	0.00	00:00
32	J80	5,663.00	0.00	5,976.53	135.85	0.00	00:00	0.00	00:00
33	J82	5,667.00	0.00	5,976.65	134.17	0.00	00:00	0.00	00:00
34	J85	5,701.00	6.36	5,976.98	119.58	6.36	00:00	6.36	00:00
35	J88	5,742.00	0.00	5,977.18	101.90	0.00	00:00	0.00	00:00
36	J90	5,757.00	0.00	5,977.41	95.50	0.00	00:00	0.00	00:00
37	J92	5,768.00	0.00	5,977.59	90.81	0.00	00:00	0.00	00:00
38	J96	5,789.00	0.00	5,978.50	82.11	0.00	00:00	0.00	00:00
39	J98	5,795.00	0.00	5,979.01	79.73	0.00	00:00	0.00	00:00
40	J100	5,805.00	0.00	5,979.55	75.63	0.00	00:00	0.00	00:00
41	J79	5,700.00	0.00	5,976.21	119.68	0.00	00:00	0.00	00:00
42	J106	5,784.00	0.00	5,978.15	84.13	0.00	00:00	0.00	00:00
43	J108	5,813.00	27.56	5,979.78	72.26	27.56	00:00	27.56	00:00
44	J110	5,774.00	33.92	5,977.21	88.05	33.92	00:00	33.92	00:00

NWDC - Water Project - Alt. 2 - Pipe Report - Peak Hour Demand

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-15.90	0.18	0.16	0.06	Open	15.90	00:00	15.90	00:00
4	P17	PVHEAST	J14	-30.74	0.35	1.62	0.19	Open	30.74	00:00	30.74	00:00
5	P19	J14	TRIPDEMANDNODE	-30.74	0.35	0.23	0.19	Open	30.74	00:00	30.74	00:00
6	P21	TRIPDEMANDNODE	J18	-109.18	1.24	0.60	1.99	Open	109.18	00:00	109.18	00:00
7	P23	J18	J20	-109.18	1.24	2.99	1.99	Open	109.18	00:00	109.18	00:00
8	P25	J20	J22	-109.18	1.24	2.00	2.00	Open	109.18	00:00	109.18	00:00
9	P27	J22	J24	-109.18	1.24	2.99	1.99	Open	109.18	00:00	109.18	00:00
10	P45	J38	J40	266.06	1.09	0.33	0.86	Open	266.06	00:00	266.06	00:00
11	P47	J40	J42	266.06	1.09	0.71	0.86	Open	266.06	00:00	266.06	00:00
12	P49	J42	J44	254.40	1.04	0.08	0.79	Open	254.40	00:00	254.40	00:00
13	P51	J44	J46	65.25	0.74	0.80	0.77	Open	65.25	00:00	65.25	00:00
14	P53	J46	J48	65.25	0.74	0.28	0.77	Open	65.25	00:00	65.25	00:00
15	P55	J48	J50	65.25	0.74	0.46	0.77	Open	65.25	00:00	65.25	00:00
16	P57	J50	J52	35.57	0.40	0.25	0.25	Open	35.57	00:00	35.57	00:00
17	P59	J52	J55	35.57	0.40	0.21	0.25	Open	35.57	00:00	35.57	00:00
18	P61	J55	J56	35.57	0.40	0.16	0.25	Open	35.57	00:00	35.57	00:00
19	P63	J56	J58	93.99	1.07	0.08	1.50	Open	93.99	00:00	93.99	00:00
20	P65	J58	J65	46.29	0.53	0.41	0.41	Open	46.29	00:00	46.29	00:00
21	P67	J65	J62	46.29	0.53	0.31	0.41	Open	46.29	00:00	46.29	00:00
22	P69	J62	J64	46.29	0.53	0.14	0.41	Open	46.29	00:00	46.29	00:00
23	P71	J64	J66	46.29	0.53	0.06	0.41	Open	46.29	00:00	46.29	00:00
24	P73	J66	J68	46.29	0.53	0.09	0.41	Open	46.29	00:00	46.29	00:00
25	P75	J68	J70	46.29	0.53	0.14	0.41	Open	46.29	00:00	46.29	00:00
26	P77	J70	J72	62.87	0.71	0.07	0.72	Open	62.87	00:00	62.87	00:00
27	P79	J72	J74	62.87	0.71	0.19	0.72	Open	62.87	00:00	62.87	00:00
28	P81	J74	J76	62.87	0.71	0.40	0.72	Open	62.87	00:00	62.87	00:00
29	P83	J76	J78	62.87	0.71	0.07	0.72	Open	62.87	00:00	62.87	00:00
30	P85	J78	J80	-46.32	0.53	0.12	0.41	Open	46.32	00:00	46.32	00:00
31	P87	J80	J82	-46.32	0.53	0.12	0.41	Open	46.32	00:00	46.32	00:00
32	P89	J82	J85	-46.32	0.53	0.33	0.41	Open	46.32	00:00	46.32	00:00
33	P95	J88	J90	-52.68	0.60	0.24	0.52	Open	52.68	00:00	52.68	00:00
34	P97	J90	J92	-52.68	0.60	0.17	0.52	Open	52.68	00:00	52.68	00:00
35	P99	J92	J106	-103.17	1.17	0.57	1.80	Open	103.17	00:00	103.17	00:00
36	P103	J96	J98	-103.17	1.17	0.52	1.80	Open	103.17	00:00	103.17	00:00
37	P105	J98	J100	-103.17	1.17	0.54	1.80	Open	103.17	00:00	103.17	00:00
38	P107	J100	J44	-103.17	1.17	0.98	1.80	Open	103.17	00:00	103.17	00:00
39	P109	J78	J79	109.18	1.24	0.20	1.99	Open	109.18	00:00	109.18	00:00
40	P111	J79	J24	109.18	1.24	2.19	1.99	Open	109.18	00:00	109.18	00:00
41	P119	J106	J96	-103.17	1.17	0.34	1.79	Open	103.17	00:00	103.17	00:00
42	P121	J88	J85	52.68	0.60	0.20	0.52	Open	52.68	00:00	52.68	00:00
43	P123	J38	TANK1	-266.06	1.09	2.59	0.86	Open	266.06	00:00	266.06	00:00
44	P125	J44	J108	85.98	0.98	0.76	1.28	Open	85.98	00:00	85.98	00:00
45	P127	J108	J56	58.42	0.66	1.39	0.63	Open	58.42	00:00	58.42	00:00

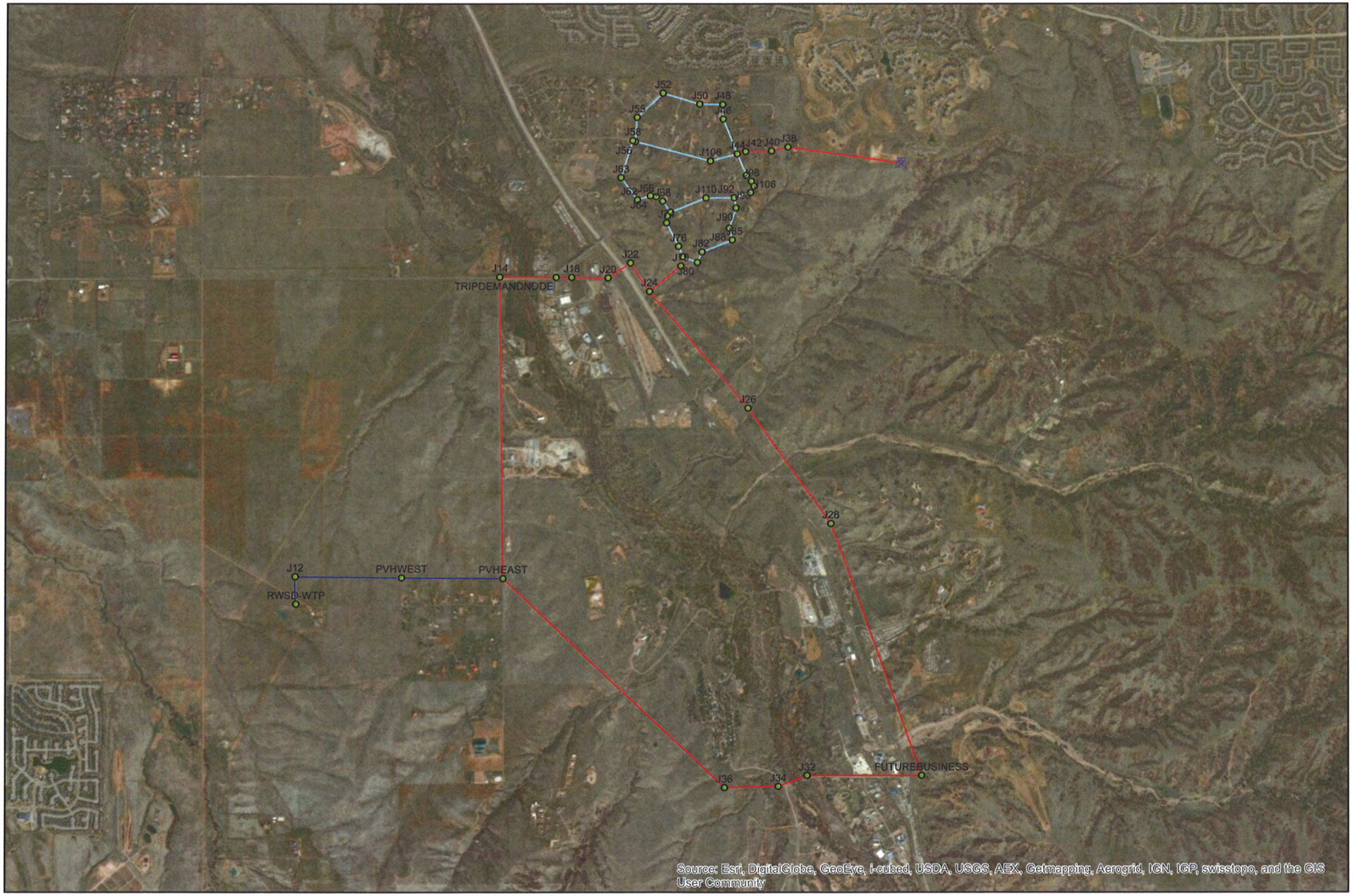
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
46	P129	J92	J110	50.49	0.57	0.38	0.48	Open	50.49	00:00	50.49	00:00
47	P131	J110	J70	16.57	0.19	0.06	0.06	Open	16.57	00:00	16.57	00:00

NWDC - Water Project - Alt. 2 - Tank Report - Peak Hour Demand

	TANK: ID (Char)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	42.72	24.25	1.00	24.25	-266.06	5,984.25	100.00	24.25	-266.06	00:00	-266.06	00:00

Alternative 3 – 570 EQR

NWDC Water Project
Alternative 3 (570 EQRs)
Overall System



Legend

- Junction
- Tank

Pipe

Diameter (in.)

- 6
- 8
- 12

N

0 0.1 0.2 0.4 0.6 0.8 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 3 - Junction Report - Overall System

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	DEMAND: DEMAND1 (Real)	NODE: X (Real)	NODE: Y (Real)
1	RWSD-WTP	5,817.00	0.00	3,128,195.23	1,601,386.47
2	J12	5,813.00	0.00	3,128,177.00	1,602,109.56
3	PVHWEST	5,798.00	15.00	3,130,963.63	1,602,080.71
4	PVHEAST	5,706.00	14.00	3,133,637.24	1,602,063.35
5	J14	5,541.00	0.00	3,133,542.80	1,610,014.87
6	TRIPDEMANDNODE	5,562.00	74.00	3,135,035.86	1,610,006.19
7	J18	5,571.00	0.00	3,135,452.52	1,610,006.19
8	J20	5,610.00	0.00	3,136,407.38	1,609,988.82
9	J22	5,760.00	0.00	3,136,988.98	1,610,388.13
10	J24	5,646.00	0.00	3,137,492.45	1,609,632.92
11	J26	5,656.00	0.00	3,140,096.62	1,606,560.01
12	J28	5,697.00	0.00	3,142,284.12	1,603,513.13
13	FUTUREBUSINESS	5,743.00	319.00	3,144,679.95	1,596,872.51
14	J32	5,647.00	0.00	3,141,659.12	1,596,872.51
15	J34	5,674.00	0.00	3,140,903.91	1,596,586.05
16	J36	5,739.00	0.00	3,139,471.62	1,596,560.01
17	J38	5,847.00	0.00	3,141,157.96	1,613,442.87
18	J40	5,853.00	0.00	3,140,720.46	1,613,338.70
19	J42	5,839.00	11.00	3,140,032.96	1,613,324.81
20	J44	5,833.00	0.00	3,139,803.79	1,613,262.31
21	J46	5,799.00	0.00	3,139,435.73	1,614,178.98
22	J48	5,781.00	0.00	3,139,421.85	1,614,567.87
23	J50	5,763.00	28.00	3,138,810.73	1,614,574.81
24	J52	5,769.00	0.00	3,137,845.46	1,614,859.54
25	J55	5,762.00	0.00	3,137,164.90	1,614,220.65
26	J56	5,751.00	0.00	3,137,116.29	1,613,588.70
27	J58	5,751.00	45.00	3,137,053.79	1,613,611.71
28	J63	5,664.00	0.00	3,136,741.29	1,612,636.01
29	J62	5,730.00	0.00	3,137,175.32	1,612,049.21
30	J64	5,751.00	0.00	3,137,512.12	1,612,155.11
31	J66	5,759.00	0.00	3,137,670.11	1,612,130.80
32	J68	5,763.00	0.00	3,137,838.51	1,612,016.22
33	J70	5,774.00	0.00	3,138,046.85	1,611,722.82
34	J72	5,773.00	0.00	3,137,960.04	1,611,620.39
35	J74	5,774.00	0.00	3,137,940.94	1,611,441.57
36	J76	5,736.00	0.00	3,138,254.31	1,610,821.78
37	J78	5,714.00	0.00	3,138,366.29	1,610,553.55
38	J80	5,663.00	0.00	3,138,751.71	1,610,402.51
39	J82	5,667.00	0.00	3,138,871.50	1,610,675.94
40	J85	5,701.00	6.00	3,139,674.45	1,610,995.39
41	J88	5,742.00	0.00	3,139,591.71	1,611,305.31
42	J90	5,757.00	0.00	3,139,775.14	1,611,835.67
43	J92	5,768.00	0.00	3,139,726.53	1,612,106.50
44	J96	5,789.00	0.00	3,140,250.84	1,612,408.58
45	J98	5,795.00	0.00	3,140,181.39	1,612,540.53
46	J100	5,805.00	0.00	3,140,052.92	1,612,696.78
47	J79	5,700.00	0.00	3,138,312.76	1,610,303.84
48	J106	5,784.00	0.00	3,140,165.72	1,612,247.15

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	DEMAND: DEMAND1 (Real)	NODE: X (Real)	NODE: Y (Real)
49	J108	5,813.00	26.00	3,139,097.13	1,613,076.03
50	J110	5,774.00	32.00	3,138,977.77	1,612,099.47

NWDC - Water Project - Alt. 3 - Pipe Report - Overall System

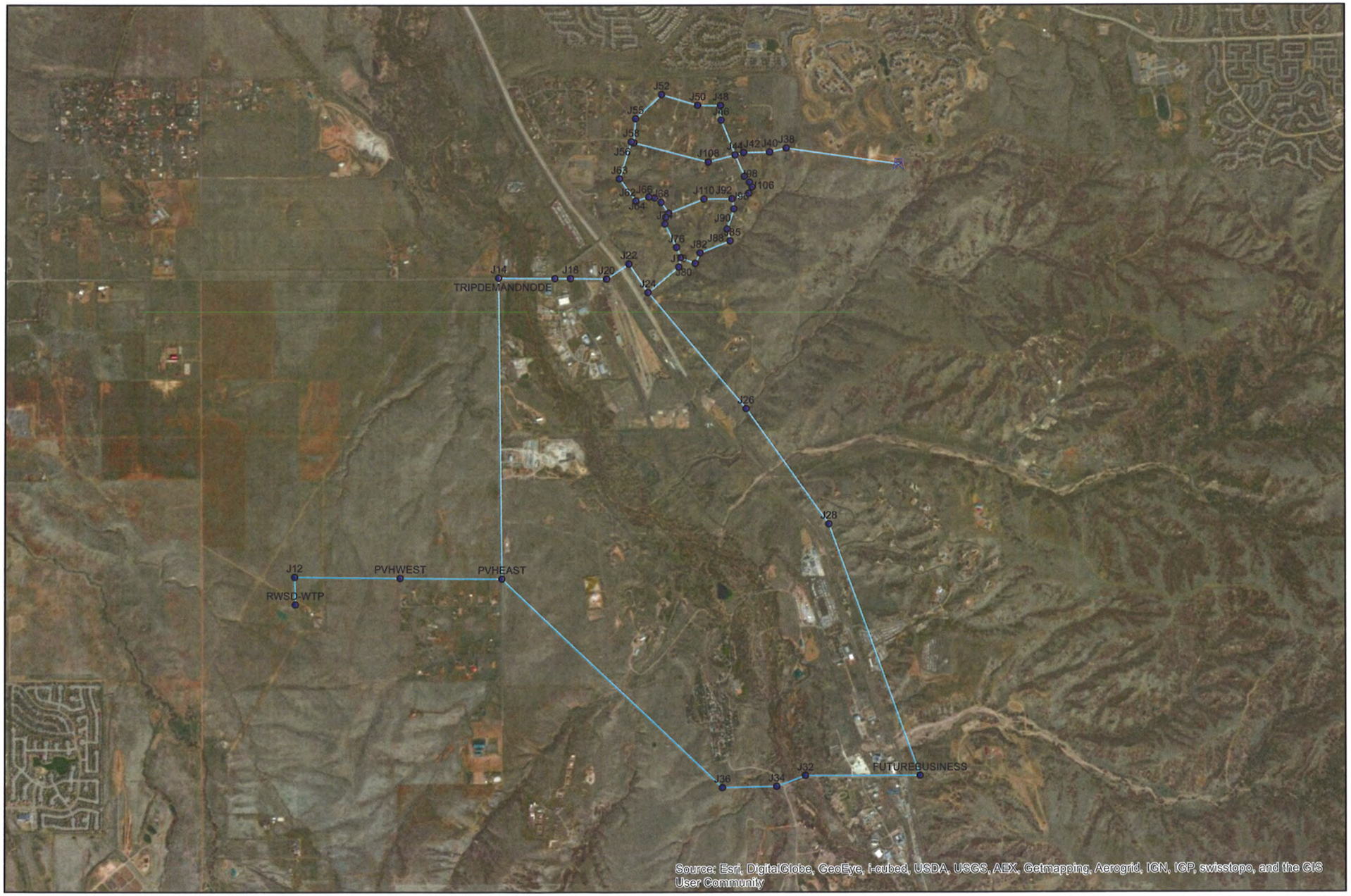
	PIPE: ID (Char)	PIPEHYD: LENGTH (Real)	PIPEHYD: DIAMETER (Real)	PIPEHYD: ROUGHNESS (Real)	PIPEHYD: MINORLOSS (Real)	PIPEHYD: TOTALIZER (Boolean)	PIPEHYD: CHK_VALVE (Boolean)	LINK: FROM (Char)	LINK: TO (Char)
1	P11	800.00	6.00	130.00	0.00	No	No	J12	RWSD-WTP
2	P13	2,800.00	6.00	130.00	0.00	No	No	J12	PVHWEST
3	P15	2,800.00	6.00	130.00	0.00	No	No	PVHWEST	PVHEAST
4	P17	8,500.00	12.00	130.00	0.00	No	No	PVHEAST	J14
5	P19	1,200.00	12.00	130.00	0.00	No	No	J14	TRIPDEMANDNODE
6	P21	300.00	12.00	130.00	0.00	No	No	TRIPDEMANDNODE	J18
7	P23	1,500.00	12.00	130.00	0.00	No	No	J18	J20
8	P25	1,000.00	12.00	130.00	0.00	No	No	J20	J22
9	P27	1,500.00	12.00	130.00	0.00	No	No	J22	J24
10	P29	3,500.00	12.00	130.00	0.00	No	No	J24	J26
11	P31	3,000.00	12.00	130.00	0.00	No	No	J26	J28
12	P33	8,000.00	12.00	130.00	0.00	No	No	J28	FUTUREBUSINESS
13	P35	4,000.00	12.00	130.00	0.00	No	No	FUTUREBUSINESS	J32
14	P37	352.00	12.00	130.00	0.00	No	No	J32	J34
15	P39	1,000.00	12.00	130.00	0.00	No	No	J34	J36
16	P41	9,000.00	12.00	130.00	0.00	No	No	J36	PVHEAST
17	P45	388.00	12.00	130.00	0.00	No	No	J38	J40
18	P47	829.00	12.00	130.00	0.00	No	No	J40	J42
19	P49	100.00	12.00	130.00	0.00	No	No	J42	J44
20	P51	1,034.00	8.00	130.00	0.00	No	No	J44	J46
21	P53	362.00	8.00	130.00	0.00	No	No	J46	J48
22	P55	597.00	8.00	130.00	0.00	No	No	J48	J50
23	P57	996.00	8.00	130.00	0.00	No	No	J50	J52
24	P59	853.00	8.00	130.00	0.00	No	No	J52	J55
25	P61	623.00	8.00	130.00	0.00	No	No	J55	J56
26	P63	50.00	8.00	130.00	0.00	No	No	J56	J58
27	P65	1,015.00	8.00	130.00	0.00	No	No	J58	J63
28	P67	763.00	8.00	130.00	0.00	No	No	J63	J62
29	P69	352.00	8.00	130.00	0.00	No	No	J62	J64
30	P71	150.00	8.00	130.00	0.00	No	No	J64	J66
31	P73	230.00	8.00	130.00	0.00	No	No	J66	J68
32	P75	335.00	8.00	130.00	0.00	No	No	J68	J70
33	P77	100.00	8.00	130.00	0.00	No	No	J70	J72
34	P79	271.00	8.00	130.00	0.00	No	No	J72	J74
35	P81	557.00	8.00	130.00	0.00	No	No	J74	J76
36	P83	100.00	8.00	130.00	0.00	No	No	J76	J78
37	P85	300.00	8.00	130.00	0.00	No	No	J78	J80
38	P87	290.00	8.00	130.00	0.00	No	No	J80	J82
39	P89	801.00	8.00	130.00	0.00	No	No	J82	J85
40	P95	457.00	8.00	130.00	0.00	No	No	J88	J90
41	P97	335.00	8.00	130.00	0.00	No	No	J90	J92
42	P99	316.00	8.00	130.00	0.00	No	No	J92	J106
43	P103	288.00	8.00	130.00	0.00	No	No	J96	J98
44	P105	299.00	8.00	130.00	0.00	No	No	J98	J100
45	P107	547.00	8.00	130.00	0.00	No	No	J100	J44
46	P109	100.00	12.00	130.00	0.00	No	No	J78	J79
47	P111	1,100.00	12.00	130.00	0.00	No	No	J79	J24
48	P119	191.00	8.00	130.00	0.00	No	No	J106	J96
49	P121	383.00	8.00	130.00	0.00	No	No	J88	J85
50	P123	3,000.00	12.00	130.00	0.00	No	No	J38	TANK1

	PIPE: ID (Char)	PIPEHYD: LENGTH (Real)	PIPEHYD: DIAMETER (Real)	PIPEHYD: ROUGHNESS (Real)	PIPEHYD: MINORLOSS (Real)	PIPEHYD: TOTALIZER (Boolean)	PIPEHYD: CHK_VALVE (Boolean)	LINK: FROM (Char)	LINK: TO (Char)
51	P125	590.00	8.00	130.00	0.00	No	No	J44	J108
52	P127	2,226.00	8.00	130.00	0.00	No	No	J108	J56
53	P129	792.00	8.00	130.00	0.00	No	No	J92	J110
54	P131	957.00	8.00	130.00	0.00	No	No	J110	J70

NWDC - Water Project - Alt. 3 - Tank Report - Overall System

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	TANKHYD: DIAMETER (Real)	NODE: X (Real)	NODE: Y (Real)
1	TANK1	5,960.00	0.00	24.25	24.25	73.52	3,144,126.36	1,613,017.42

NWDC Water Project
Alternative 3 (570 EQRs)
Static Flow Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.1 0.2 0.4 0.6 0.8 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 3 - Junction Report - Static Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,984.25	72.47	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,984.25	74.20	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	0.00	5,984.25	80.70	0.00	00:00	0.00	00:00
4	PVHEAST	5,706.00	0.00	5,984.25	120.57	0.00	00:00	0.00	00:00
5	J14	5,541.00	0.00	5,984.25	192.06	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	0.00	5,984.25	182.96	0.00	00:00	0.00	00:00
7	J18	5,571.00	0.00	5,984.25	179.06	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,984.25	162.16	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,984.25	97.17	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,984.25	146.56	0.00	00:00	0.00	00:00
11	J26	5,656.00	0.00	5,984.25	142.23	0.00	00:00	0.00	00:00
12	J28	5,697.00	0.00	5,984.25	124.47	0.00	00:00	0.00	00:00
13	FUTUREBUSINESS	5,743.00	0.00	5,984.25	104.53	0.00	00:00	0.00	00:00
14	J32	5,647.00	0.00	5,984.25	146.13	0.00	00:00	0.00	00:00
15	J34	5,674.00	0.00	5,984.25	134.43	0.00	00:00	0.00	00:00
16	J36	5,739.00	0.00	5,984.25	106.27	0.00	00:00	0.00	00:00
17	J38	5,847.00	0.00	5,984.25	59.47	0.00	00:00	0.00	00:00
18	J40	5,853.00	0.00	5,984.25	56.87	0.00	00:00	0.00	00:00
19	J42	5,839.00	0.00	5,984.25	62.94	0.00	00:00	0.00	00:00
20	J44	5,833.00	0.00	5,984.25	65.54	0.00	00:00	0.00	00:00
21	J46	5,799.00	0.00	5,984.25	80.27	0.00	00:00	0.00	00:00
22	J48	5,781.00	0.00	5,984.25	88.07	0.00	00:00	0.00	00:00
23	J50	5,763.00	0.00	5,984.25	95.87	0.00	00:00	0.00	00:00
24	J52	5,769.00	0.00	5,984.25	93.27	0.00	00:00	0.00	00:00
25	J55	5,762.00	0.00	5,984.25	96.30	0.00	00:00	0.00	00:00
26	J56	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
27	J58	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
28	J63	5,664.00	0.00	5,984.25	138.76	0.00	00:00	0.00	00:00
29	J62	5,730.00	0.00	5,984.25	110.17	0.00	00:00	0.00	00:00
30	J64	5,751.00	0.00	5,984.25	101.07	0.00	00:00	0.00	00:00
31	J66	5,759.00	0.00	5,984.25	97.60	0.00	00:00	0.00	00:00
32	J68	5,763.00	0.00	5,984.25	95.87	0.00	00:00	0.00	00:00
33	J70	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00
34	J72	5,773.00	0.00	5,984.25	91.53	0.00	00:00	0.00	00:00
35	J74	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00
36	J76	5,736.00	0.00	5,984.25	107.57	0.00	00:00	0.00	00:00
37	J78	5,714.00	0.00	5,984.25	117.10	0.00	00:00	0.00	00:00
38	J80	5,663.00	0.00	5,984.25	139.20	0.00	00:00	0.00	00:00
39	J82	5,667.00	0.00	5,984.25	137.46	0.00	00:00	0.00	00:00
40	J85	5,701.00	0.00	5,984.25	122.73	0.00	00:00	0.00	00:00
41	J88	5,742.00	0.00	5,984.25	104.97	0.00	00:00	0.00	00:00
42	J90	5,757.00	0.00	5,984.25	98.47	0.00	00:00	0.00	00:00
43	J92	5,768.00	0.00	5,984.25	93.70	0.00	00:00	0.00	00:00
44	J96	5,789.00	0.00	5,984.25	84.60	0.00	00:00	0.00	00:00
45	J98	5,795.00	0.00	5,984.25	82.00	0.00	00:00	0.00	00:00
46	J100	5,805.00	0.00	5,984.25	77.67	0.00	00:00	0.00	00:00
47	J79	5,700.00	0.00	5,984.25	123.17	0.00	00:00	0.00	00:00
48	J106	5,784.00	0.00	5,984.25	86.77	0.00	00:00	0.00	00:00

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
49	J108	5,813.00	0.00	5,984.25	74.20	0.00	00:00	0.00	00:00
50	J110	5,774.00	0.00	5,984.25	91.10	0.00	00:00	0.00	00:00

NWDC - Water Project - Alt. 3 - Pipe Report - Static Demand

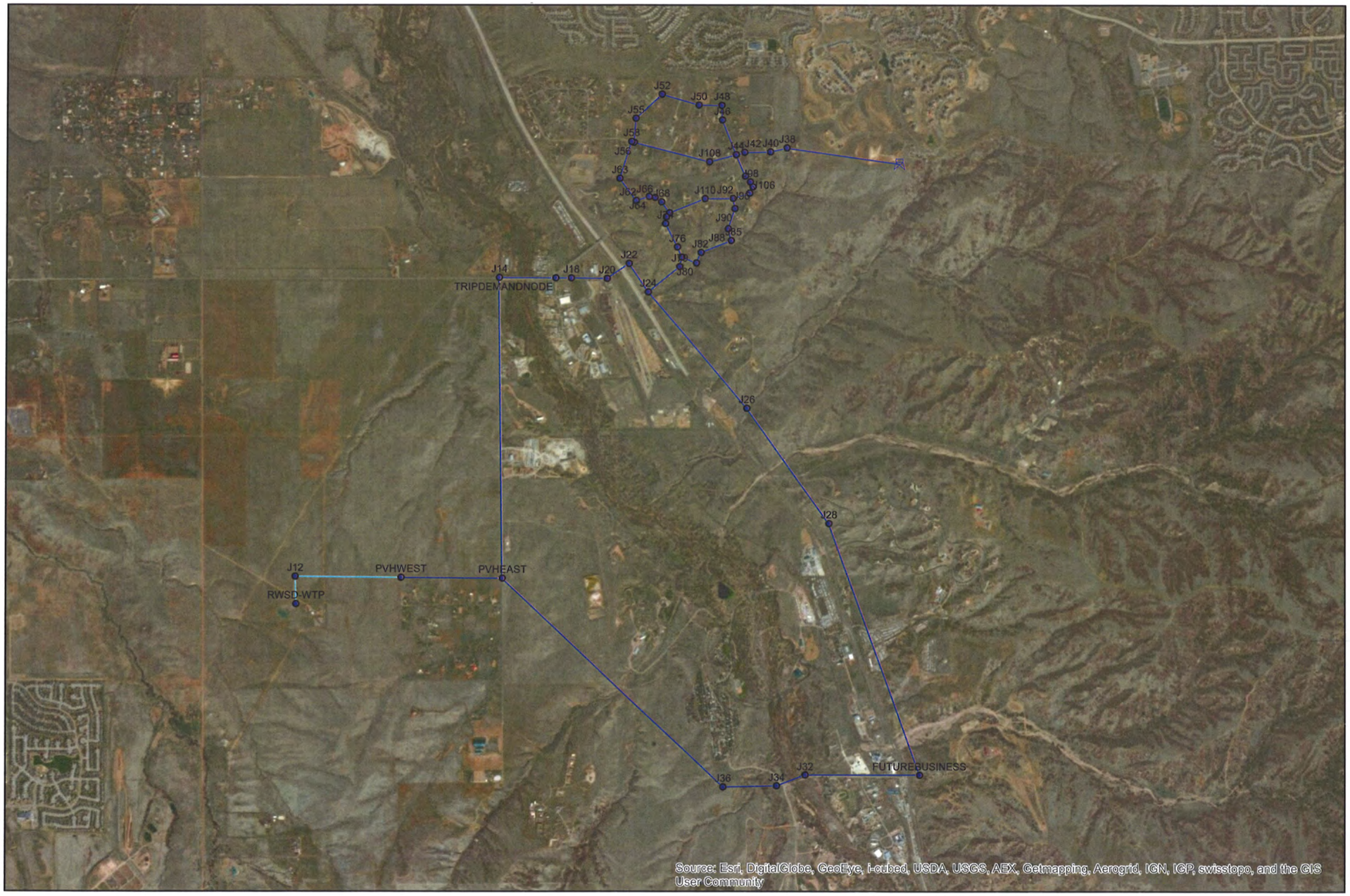
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
4	P17	PVHEAST	J14	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
5	P19	J14	TRIPDEMANDNODE	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
6	P21	TRIPDEMANDNODE	J18	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
7	P23	J18	J20	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
8	P25	J20	J22	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
9	P27	J22	J24	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
10	P29	J24	J26	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
11	P31	J26	J28	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
12	P33	J28	FUTUREBUSINESS	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
13	P35	FUTUREBUSINESS	J32	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
14	P37	J32	J34	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
15	P39	J34	J36	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
16	P41	J36	PVHEAST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
17	P45	J38	J40	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
18	P47	J40	J42	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
19	P49	J42	J44	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
20	P51	J44	J46	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
21	P53	J46	J48	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
22	P55	J48	J50	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
23	P57	J50	J52	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
24	P59	J52	J55	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
25	P61	J55	J56	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
26	P63	J56	J58	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
27	P65	J58	J63	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
28	P67	J63	J62	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
29	P69	J62	J64	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
30	P71	J64	J66	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
31	P73	J66	J68	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
32	P75	J68	J70	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
33	P77	J70	J72	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
34	P79	J72	J74	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
35	P81	J74	J76	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
36	P83	J76	J78	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
37	P85	J78	J80	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
38	P87	J80	J82	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
39	P89	J82	J85	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
40	P95	J88	J90	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
41	P97	J90	J92	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
42	P99	J92	J106	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
43	P103	J96	J98	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
44	P105	J98	J100	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
45	P107	J100	J44	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
46	P109	J78	J79	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
47	P111	J79	J24	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
48	P119	J106	J96	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
49	P121	J88	J85	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
50	P123	J38	TANK1	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
51	P125	J44	J108	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
52	P127	J108	J56	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
53	P129	J92	J110	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
54	P131	J110	J70	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00

NWDC - Water Project - Alt. 3 - Tank Report - Static Demand

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	5,960.00	73.52	24.25	0.00	24.25	0.00	5,984.25	100.00	24.25	0.00	00:00	0.00	00:00

NWDC Water Project
Alternative 3 (570 EQRs)
Average Day Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.1 0.2 0.4 0.6 0.8 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 3 - Junction Report - Avg Day Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,983.29	72.06	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,983.29	73.79	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	4.08	5,983.29	80.29	4.08	00:00	4.08	00:00
4	PVHEAST	5,706.00	3.81	5,983.30	120.15	3.81	00:00	3.81	00:00
5	J14	5,541.00	0.00	5,983.35	191.67	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	20.13	5,983.36	182.58	20.13	00:00	20.13	00:00
7	J18	5,571.00	0.00	5,983.37	178.68	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,983.39	161.79	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,983.40	96.80	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,983.42	146.20	0.00	00:00	0.00	00:00
11	J26	5,656.00	0.00	5,983.38	141.85	0.00	00:00	0.00	00:00
12	J28	5,697.00	0.00	5,983.34	124.07	0.00	00:00	0.00	00:00
13	FUTUREBUSINESS	5,743.00	86.77	5,983.24	104.10	86.77	00:00	86.77	00:00
14	J32	5,647.00	0.00	5,983.26	145.70	0.00	00:00	0.00	00:00
15	J34	5,674.00	0.00	5,983.26	134.00	0.00	00:00	0.00	00:00
16	J36	5,739.00	0.00	5,983.27	105.84	0.00	00:00	0.00	00:00
17	J38	5,847.00	0.00	5,984.01	59.37	0.00	00:00	0.00	00:00
18	J40	5,853.00	0.00	5,983.98	56.75	0.00	00:00	0.00	00:00
19	J42	5,839.00	2.99	5,983.91	62.79	2.99	00:00	2.99	00:00
20	J44	5,833.00	0.00	5,983.90	65.39	0.00	00:00	0.00	00:00
21	J46	5,799.00	0.00	5,983.87	80.10	0.00	00:00	0.00	00:00
22	J48	5,781.00	0.00	5,983.86	87.90	0.00	00:00	0.00	00:00
23	J50	5,763.00	7.62	5,983.84	95.69	7.62	00:00	7.62	00:00
24	J52	5,769.00	0.00	5,983.82	93.08	0.00	00:00	0.00	00:00
25	J55	5,762.00	0.00	5,983.80	96.11	0.00	00:00	0.00	00:00
26	J56	5,751.00	0.00	5,983.79	100.87	0.00	00:00	0.00	00:00
27	J58	5,751.00	12.24	5,983.79	100.87	12.24	00:00	12.24	00:00
28	J63	5,664.00	0.00	5,983.72	138.54	0.00	00:00	0.00	00:00
29	J62	5,730.00	0.00	5,983.67	109.92	0.00	00:00	0.00	00:00
30	J64	5,751.00	0.00	5,983.65	100.81	0.00	00:00	0.00	00:00
31	J66	5,759.00	0.00	5,983.64	97.34	0.00	00:00	0.00	00:00
32	J68	5,763.00	0.00	5,983.63	95.60	0.00	00:00	0.00	00:00
33	J70	5,774.00	0.00	5,983.60	90.82	0.00	00:00	0.00	00:00
34	J72	5,773.00	0.00	5,983.59	91.25	0.00	00:00	0.00	00:00
35	J74	5,774.00	0.00	5,983.56	90.80	0.00	00:00	0.00	00:00
36	J76	5,736.00	0.00	5,983.49	107.24	0.00	00:00	0.00	00:00
37	J78	5,714.00	0.00	5,983.47	116.76	0.00	00:00	0.00	00:00
38	J80	5,663.00	0.00	5,983.49	138.87	0.00	00:00	0.00	00:00
39	J82	5,667.00	0.00	5,983.51	137.14	0.00	00:00	0.00	00:00
40	J85	5,701.00	1.63	5,983.56	122.43	1.63	00:00	1.63	00:00
41	J88	5,742.00	0.00	5,983.59	104.68	0.00	00:00	0.00	00:00
42	J90	5,757.00	0.00	5,983.62	98.19	0.00	00:00	0.00	00:00
43	J92	5,768.00	0.00	5,983.64	93.44	0.00	00:00	0.00	00:00
44	J96	5,789.00	0.00	5,983.72	84.37	0.00	00:00	0.00	00:00
45	J98	5,795.00	0.00	5,983.77	81.79	0.00	00:00	0.00	00:00
46	J100	5,805.00	0.00	5,983.82	77.48	0.00	00:00	0.00	00:00
47	J79	5,700.00	0.00	5,983.47	122.83	0.00	00:00	0.00	00:00
48	J106	5,784.00	0.00	5,983.69	86.53	0.00	00:00	0.00	00:00

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
49	J108	5,813.00	7.07	5,983.87	74.04	7.07	00:00	7.07	00:00
50	J110	5,774.00	8.70	5,983.62	90.83	8.70	00:00	8.70	00:00

NWDC - Water Project - Alt. 3 - Pipe Report - Avg Day Demand

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-4.09	0.05	0.01	0.00	Open	4.09	00:00	4.09	00:00
4	P17	PVHEAST	J14	-38.82	0.11	0.05	0.01	Open	38.82	00:00	38.82	00:00
5	P19	J14	TRIPDEMANDNODE	-38.82	0.11	0.01	0.01	Open	38.82	00:00	38.82	00:00
6	P21	TRIPDEMANDNODE	J18	-58.94	0.17	0.00	0.01	Open	58.94	00:00	58.94	00:00
7	P23	J18	J20	-58.94	0.17	0.02	0.01	Open	58.94	00:00	58.94	00:00
8	P25	J20	J22	-58.94	0.17	0.01	0.01	Open	58.94	00:00	58.94	00:00
9	P27	J22	J24	-58.94	0.17	0.02	0.01	Open	58.94	00:00	58.94	00:00
10	P29	J24	J26	55.85	0.16	0.04	0.01	Open	55.85	00:00	55.85	00:00
11	P31	J26	J28	55.85	0.16	0.04	0.01	Open	55.85	00:00	55.85	00:00
12	P33	J28	FUTUREBUSINESS	55.85	0.16	0.10	0.01	Open	55.85	00:00	55.85	00:00
13	P35	FUTUREBUSINESS	J32	-30.92	0.09	0.02	0.00	Open	30.92	00:00	30.92	00:00
14	P37	J32	J34	-30.92	0.09	0.00	0.00	Open	30.92	00:00	30.92	00:00
15	P39	J34	J36	-30.92	0.09	0.00	0.00	Open	30.92	00:00	30.92	00:00
16	P41	J36	PVHEAST	-30.92	0.09	0.04	0.00	Open	30.92	00:00	30.92	00:00
17	P45	J38	J40	155.05	0.44	0.03	0.08	Open	155.05	00:00	155.05	00:00
18	P47	J40	J42	155.05	0.44	0.07	0.08	Open	155.05	00:00	155.05	00:00
19	P49	J42	J44	152.05	0.43	0.01	0.08	Open	152.05	00:00	152.05	00:00
20	P51	J44	J46	32.39	0.21	0.03	0.03	Open	32.39	00:00	32.39	00:00
21	P53	J46	J48	32.39	0.21	0.01	0.03	Open	32.39	00:00	32.39	00:00
22	P55	J48	J50	32.39	0.21	0.02	0.03	Open	32.39	00:00	32.39	00:00
23	P57	J50	J52	24.77	0.16	0.02	0.02	Open	24.77	00:00	24.77	00:00
24	P59	J52	J55	24.77	0.16	0.02	0.02	Open	24.77	00:00	24.77	00:00
25	P61	J55	J56	24.77	0.16	0.01	0.02	Open	24.77	00:00	24.77	00:00
26	P63	J56	J58	59.60	0.38	0.00	0.10	Open	59.60	00:00	59.60	00:00
27	P65	J58	J63	47.36	0.30	0.07	0.06	Open	47.36	00:00	47.36	00:00
28	P67	J63	J62	47.36	0.30	0.05	0.06	Open	47.36	00:00	47.36	00:00
29	P69	J62	J64	47.36	0.30	0.02	0.06	Open	47.36	00:00	47.36	00:00
30	P71	J64	J66	47.36	0.30	0.01	0.07	Open	47.36	00:00	47.36	00:00
31	P73	J66	J68	47.36	0.30	0.01	0.06	Open	47.36	00:00	47.36	00:00
32	P75	J68	J70	47.36	0.30	0.02	0.06	Open	47.36	00:00	47.36	00:00
33	P77	J70	J72	68.23	0.44	0.01	0.13	Open	68.23	00:00	68.23	00:00
34	P79	J72	J74	68.23	0.44	0.03	0.13	Open	68.23	00:00	68.23	00:00
35	P81	J74	J76	68.23	0.44	0.07	0.13	Open	68.23	00:00	68.23	00:00
36	P83	J76	J78	68.23	0.44	0.01	0.13	Open	68.23	00:00	68.23	00:00
37	P85	J78	J80	-46.57	0.30	0.02	0.06	Open	46.57	00:00	46.57	00:00
38	P87	J80	J82	-46.57	0.30	0.02	0.06	Open	46.57	00:00	46.57	00:00
39	P89	J82	J85	-46.57	0.30	0.05	0.06	Open	46.57	00:00	46.57	00:00
40	P95	J88	J90	-48.20	0.31	0.03	0.07	Open	48.20	00:00	48.20	00:00
41	P97	J90	J92	-48.20	0.31	0.02	0.07	Open	48.20	00:00	48.20	00:00
42	P99	J92	J106	-77.76	0.50	0.05	0.16	Open	77.76	00:00	77.76	00:00
43	P103	J96	J98	-77.76	0.50	0.05	0.16	Open	77.76	00:00	77.76	00:00
44	P105	J98	J100	-77.76	0.50	0.05	0.16	Open	77.76	00:00	77.76	00:00
45	P107	J100	J44	-77.76	0.50	0.09	0.16	Open	77.76	00:00	77.76	00:00

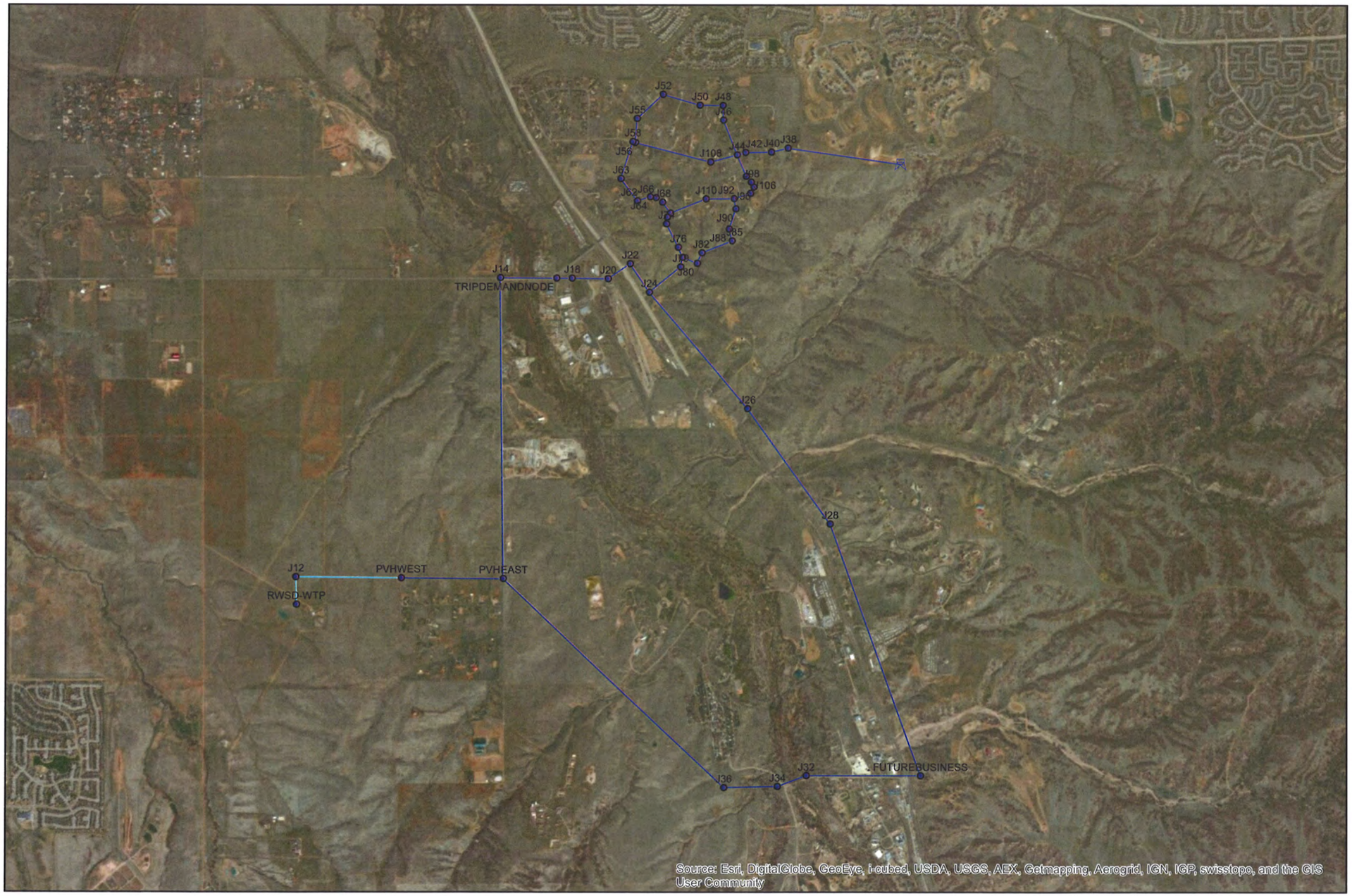
NWDC - Water Project - Alt. 3 - Pipe Report - Avg Day Demand

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
46	P109	J78	J79	114.79	0.33	0.00	0.04	Open	114.79	00:00	114.79	00:00
47	P111	J79	J24	114.79	0.33	0.05	0.05	Open	114.79	00:00	114.79	00:00
48	P119	J106	J96	-77.76	0.50	0.03	0.16	Open	77.76	00:00	77.76	00:00
49	P121	J88	J85	48.20	0.31	0.03	0.07	Open	48.20	00:00	48.20	00:00
50	P123	J38	TANK1	-155.05	0.44	0.24	0.08	Open	155.05	00:00	155.05	00:00
51	P125	J44	J108	41.90	0.27	0.03	0.05	Open	41.90	00:00	41.90	00:00
52	P127	J108	J56	34.83	0.22	0.08	0.04	Open	34.83	00:00	34.83	00:00
53	P129	J92	J110	29.57	0.19	0.02	0.03	Open	29.57	00:00	29.57	00:00
54	P131	J110	J70	20.86	0.13	0.01	0.01	Open	20.86	00:00	20.86	00:00

NWDC - Water Project - Alt. 3 - Tank Report - Avg Day Demand

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	5,960.00	73.52	24.25	0.00	24.25	-155.05	5,984.25	100.00	24.25	-155.05	00:00	-155.05	00:00

NWDC Water Project
Alternative 3 (570 EQRs)
Max Day Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.1 0.2 0.4 0.6 0.8 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 3 - Junction Report - Max Day Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,978.64	70.04	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,978.64	71.77	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	10.60	5,978.64	78.27	10.60	00:00	10.60	00:00
4	PVHEAST	5,706.00	9.90	5,978.69	118.16	9.90	00:00	9.90	00:00
5	J14	5,541.00	0.00	5,979.00	189.78	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	52.32	5,979.04	180.70	52.32	00:00	52.32	00:00
7	J18	5,571.00	0.00	5,979.06	176.81	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,979.18	159.97	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,979.26	95.00	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,979.38	144.45	0.00	00:00	0.00	00:00
11	J26	5,656.00	0.00	5,979.13	140.01	0.00	00:00	0.00	00:00
12	J28	5,697.00	0.00	5,978.92	122.15	0.00	00:00	0.00	00:00
13	FUTUREBUSINESS	5,743.00	225.53	5,978.35	101.98	225.53	00:00	225.53	00:00
14	J32	5,647.00	0.00	5,978.44	143.61	0.00	00:00	0.00	00:00
15	J34	5,674.00	0.00	5,978.45	131.92	0.00	00:00	0.00	00:00
16	J36	5,739.00	0.00	5,978.47	103.76	0.00	00:00	0.00	00:00
17	J38	5,847.00	0.00	5,982.84	58.86	0.00	00:00	0.00	00:00
18	J40	5,853.00	0.00	5,982.65	56.18	0.00	00:00	0.00	00:00
19	J42	5,839.00	7.78	5,982.26	62.08	7.78	00:00	7.78	00:00
20	J44	5,833.00	0.00	5,982.22	64.66	0.00	00:00	0.00	00:00
21	J46	5,799.00	0.00	5,982.03	79.31	0.00	00:00	0.00	00:00
22	J48	5,781.00	0.00	5,981.96	87.08	0.00	00:00	0.00	00:00
23	J50	5,763.00	19.80	5,981.85	94.83	19.80	00:00	19.80	00:00
24	J52	5,769.00	0.00	5,981.73	92.18	0.00	00:00	0.00	00:00
25	J55	5,762.00	0.00	5,981.64	95.17	0.00	00:00	0.00	00:00
26	J56	5,751.00	0.00	5,981.57	99.90	0.00	00:00	0.00	00:00
27	J58	5,751.00	31.81	5,981.54	99.89	31.81	00:00	31.81	00:00
28	J63	5,664.00	0.00	5,981.15	137.42	0.00	00:00	0.00	00:00
29	J62	5,730.00	0.00	5,980.87	108.70	0.00	00:00	0.00	00:00
30	J64	5,751.00	0.00	5,980.73	99.54	0.00	00:00	0.00	00:00
31	J66	5,759.00	0.00	5,980.68	96.05	0.00	00:00	0.00	00:00
32	J68	5,763.00	0.00	5,980.59	94.28	0.00	00:00	0.00	00:00
33	J70	5,774.00	0.00	5,980.46	89.46	0.00	00:00	0.00	00:00
34	J72	5,773.00	0.00	5,980.39	89.86	0.00	00:00	0.00	00:00
35	J74	5,774.00	0.00	5,980.19	89.34	0.00	00:00	0.00	00:00
36	J76	5,736.00	0.00	5,979.77	105.63	0.00	00:00	0.00	00:00
37	J78	5,714.00	0.00	5,979.70	115.13	0.00	00:00	0.00	00:00
38	J80	5,663.00	0.00	5,979.81	137.27	0.00	00:00	0.00	00:00
39	J82	5,667.00	0.00	5,979.92	135.59	0.00	00:00	0.00	00:00
40	J85	5,701.00	4.24	5,980.21	120.98	4.24	00:00	4.24	00:00
41	J88	5,742.00	0.00	5,980.36	103.28	0.00	00:00	0.00	00:00
42	J90	5,757.00	0.00	5,980.54	96.86	0.00	00:00	0.00	00:00
43	J92	5,768.00	0.00	5,980.67	92.15	0.00	00:00	0.00	00:00
44	J96	5,789.00	0.00	5,981.15	83.26	0.00	00:00	0.00	00:00
45	J98	5,795.00	0.00	5,981.42	80.78	0.00	00:00	0.00	00:00
46	J100	5,805.00	0.00	5,981.70	76.56	0.00	00:00	0.00	00:00
47	J79	5,700.00	0.00	5,979.67	121.18	0.00	00:00	0.00	00:00
48	J106	5,784.00	0.00	5,980.97	85.35	0.00	00:00	0.00	00:00

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
49	J108	5,813.00	18.38	5,982.04	73.25	18.38	00:00	18.38	00:00
50	J110	5,774.00	22.62	5,980.54	89.49	22.62	00:00	22.62	00:00

NWDC - Water Project - Alt. 3 - Pipe Report - Max Day Demand

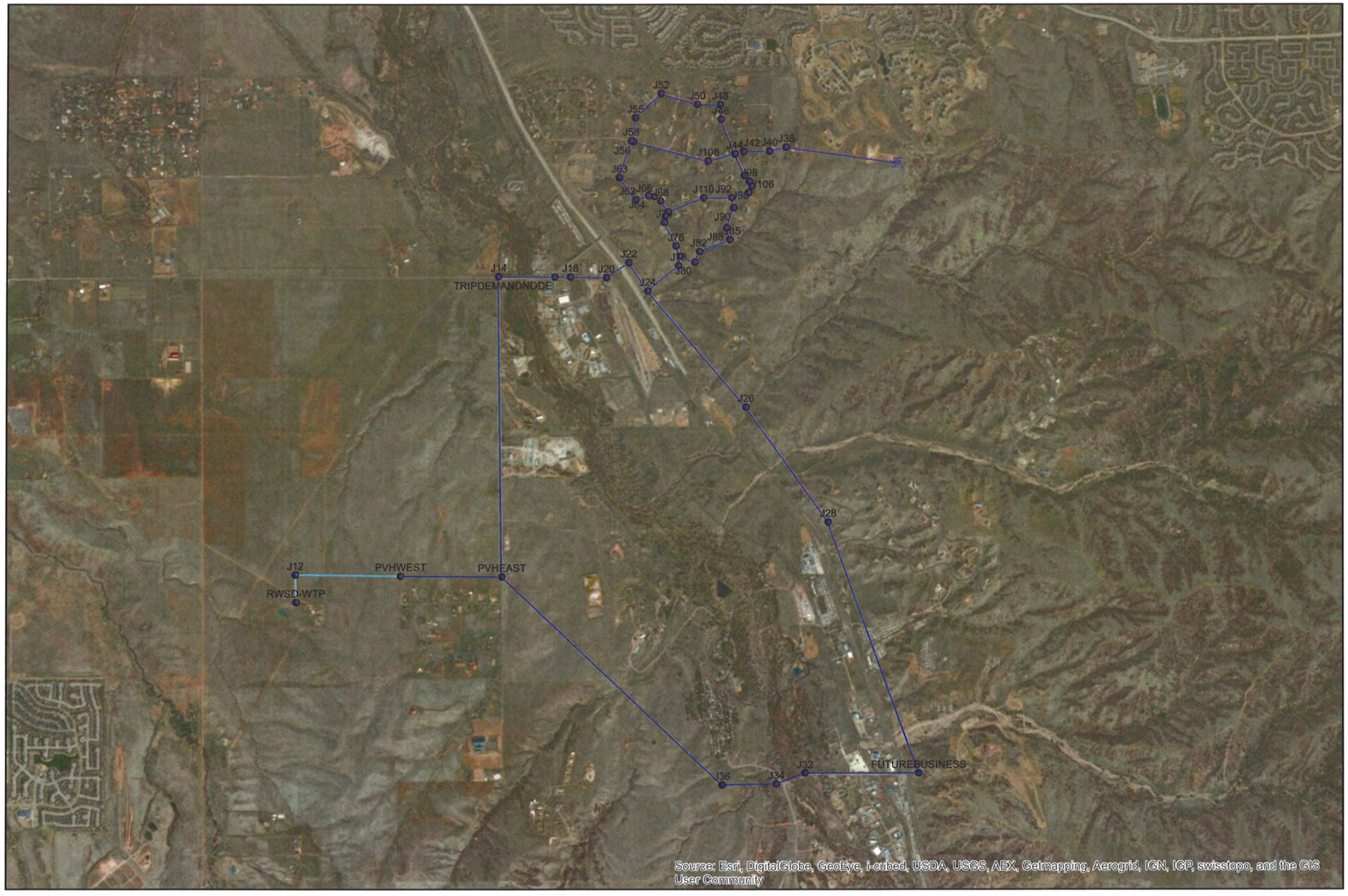
	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-10.60	0.12	0.05	0.02	Open	10.60	00:00	10.60	00:00
4	P17	PVHEAST	J14	-100.88	0.29	0.31	0.04	Open	100.88	00:00	100.88	00:00
5	P19	J14	TRIPDEMANDNODE	-100.88	0.29	0.04	0.04	Open	100.88	00:00	100.88	00:00
6	P21	TRIPDEMANDNODE	J18	-153.20	0.43	0.02	0.08	Open	153.20	00:00	153.20	00:00
7	P23	J18	J20	-153.20	0.43	0.12	0.08	Open	153.20	00:00	153.20	00:00
8	P25	J20	J22	-153.20	0.43	0.08	0.08	Open	153.20	00:00	153.20	00:00
9	P27	J22	J24	-153.20	0.43	0.12	0.08	Open	153.20	00:00	153.20	00:00
10	P29	J24	J26	145.15	0.41	0.25	0.07	Open	145.15	00:00	145.15	00:00
11	P31	J26	J28	145.15	0.41	0.21	0.07	Open	145.15	00:00	145.15	00:00
12	P33	J28	FUTUREBUSINESS	145.15	0.41	0.57	0.07	Open	145.15	00:00	145.15	00:00
13	P35	FUTUREBUSINESS	J32	-80.38	0.23	0.09	0.02	Open	80.38	00:00	80.38	00:00
14	P37	J32	J34	-80.38	0.23	0.01	0.02	Open	80.38	00:00	80.38	00:00
15	P39	J34	J36	-80.38	0.23	0.02	0.02	Open	80.38	00:00	80.38	00:00
16	P41	J36	PVHEAST	-80.38	0.23	0.21	0.02	Open	80.38	00:00	80.38	00:00
17	P45	J38	J40	402.99	1.14	0.18	0.47	Open	402.99	00:00	402.99	00:00
18	P47	J40	J42	402.99	1.14	0.39	0.47	Open	402.99	00:00	402.99	00:00
19	P49	J42	J44	395.21	1.12	0.05	0.45	Open	395.21	00:00	395.21	00:00
20	P51	J44	J46	84.18	0.54	0.19	0.19	Open	84.18	00:00	84.18	00:00
21	P53	J46	J48	84.18	0.54	0.07	0.19	Open	84.18	00:00	84.18	00:00
22	P55	J48	J50	84.18	0.54	0.11	0.19	Open	84.18	00:00	84.18	00:00
23	P57	J50	J52	64.38	0.41	0.11	0.11	Open	64.38	00:00	64.38	00:00
24	P59	J52	J55	64.38	0.41	0.10	0.11	Open	64.38	00:00	64.38	00:00
25	P61	J55	J56	64.38	0.41	0.07	0.11	Open	64.38	00:00	64.38	00:00
26	P63	J56	J58	154.91	0.99	0.03	0.58	Open	154.91	00:00	154.91	00:00
27	P65	J58	J63	123.10	0.79	0.38	0.38	Open	123.10	00:00	123.10	00:00
28	P67	J63	J62	123.10	0.79	0.29	0.38	Open	123.10	00:00	123.10	00:00
29	P69	J62	J64	123.10	0.79	0.13	0.38	Open	123.10	00:00	123.10	00:00
30	P71	J64	J66	123.10	0.79	0.06	0.38	Open	123.10	00:00	123.10	00:00
31	P73	J66	J68	123.10	0.79	0.09	0.38	Open	123.10	00:00	123.10	00:00
32	P75	J68	J70	123.10	0.79	0.13	0.38	Open	123.10	00:00	123.10	00:00
33	P77	J70	J72	177.33	1.13	0.07	0.74	Open	177.33	00:00	177.33	00:00
34	P79	J72	J74	177.33	1.13	0.20	0.74	Open	177.33	00:00	177.33	00:00
35	P81	J74	J76	177.33	1.13	0.41	0.74	Open	177.33	00:00	177.33	00:00
36	P83	J76	J78	177.33	1.13	0.07	0.74	Open	177.33	00:00	177.33	00:00
37	P85	J78	J80	-121.03	0.77	0.11	0.37	Open	121.03	00:00	121.03	00:00
38	P87	J80	J82	-121.03	0.77	0.11	0.37	Open	121.03	00:00	121.03	00:00
39	P89	J82	J85	-121.03	0.77	0.29	0.37	Open	121.03	00:00	121.03	00:00
40	P95	J88	J90	-125.27	0.80	0.18	0.39	Open	125.27	00:00	125.27	00:00
41	P97	J90	J92	-125.27	0.80	0.13	0.39	Open	125.27	00:00	125.27	00:00
42	P99	J92	J106	-202.12	1.29	0.30	0.95	Open	202.12	00:00	202.12	00:00
43	P103	J96	J98	-202.12	1.29	0.27	0.94	Open	202.12	00:00	202.12	00:00
44	P105	J98	J100	-202.12	1.29	0.28	0.95	Open	202.12	00:00	202.12	00:00
45	P107	J100	J44	-202.12	1.29	0.52	0.95	Open	202.12	00:00	202.12	00:00
46	P109	J78	J79	298.35	0.85	0.03	0.27	Open	298.35	00:00	298.35	00:00
47	P111	J79	J24	298.35	0.85	0.30	0.27	Open	298.35	00:00	298.35	00:00
48	P119	J106	J96	-202.12	1.29	0.18	0.95	Open	202.12	00:00	202.12	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
49	P121	J88	J85	125.27	0.80	0.15	0.39	Open	125.27	00:00	125.27	00:00
50	P123	J38	TANK1	-402.99	1.14	1.41	0.47	Open	402.99	00:00	402.99	00:00
51	P125	J44	J108	108.91	0.70	0.18	0.30	Open	108.91	00:00	108.91	00:00
52	P127	J108	J56	90.53	0.58	0.48	0.21	Open	90.53	00:00	90.53	00:00
53	P129	J92	J110	76.85	0.49	0.13	0.16	Open	76.85	00:00	76.85	00:00
54	P131	J110	J70	54.23	0.35	0.08	0.08	Open	54.23	00:00	54.23	00:00

NWDC - Water Project - Alt. 3 - Tank Report - Max Day Demand

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	5,960.00	73.52	24.25	0.00	24.25	-402.99	5,984.25	100.00	24.25	-402.99	00:00	-402.99	00:00

NWDC Water Project
Alternative 3 (570 EQRs)
Peak Hour Demand



Legend

Junction

Pressure (psi)

- less than 0.00
- 0.00 ~ 10.00
- 10.00 ~ 20.00
- 20.00 ~ 40.00
- greater than 40.00
- Tank

Pipe

Velocity (fps)

- less than 0.00
- 0.00 ~ 8.00
- 8.00 ~ 10.00
- greater than 10.00

N

0 0.1 0.2 0.4 0.6 0.8 Miles

TST INFRASTRUCTURE, LLC
Consulting Engineers

NWDC - Water Project - Alt. 3 - Junction Report - Peak Hour Demand

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	RWSD-WTP	5,817.00	0.00	5,972.38	67.32	0.00	00:00	0.00	00:00
2	J12	5,813.00	0.00	5,972.38	69.06	0.00	00:00	0.00	00:00
3	PVHWEST	5,798.00	15.90	5,972.38	75.56	15.90	00:00	15.90	00:00
4	PVHEAST	5,706.00	14.84	5,972.47	115.46	14.84	00:00	14.84	00:00
5	J14	5,541.00	0.00	5,973.13	187.24	0.00	00:00	0.00	00:00
6	TRIPDEMANDNODE	5,562.00	78.44	5,973.22	178.18	78.44	00:00	78.44	00:00
7	J18	5,571.00	0.00	5,973.27	174.30	0.00	00:00	0.00	00:00
8	J20	5,610.00	0.00	5,973.52	157.51	0.00	00:00	0.00	00:00
9	J22	5,760.00	0.00	5,973.68	92.59	0.00	00:00	0.00	00:00
10	J24	5,646.00	0.00	5,973.93	142.09	0.00	00:00	0.00	00:00
11	J26	5,656.00	0.00	5,973.41	137.53	0.00	00:00	0.00	00:00
12	J28	5,697.00	0.00	5,972.96	119.57	0.00	00:00	0.00	00:00
13	FUTUREBUSINESS	5,743.00	338.14	5,971.75	99.12	338.14	00:00	338.14	00:00
14	J32	5,647.00	0.00	5,971.95	140.80	0.00	00:00	0.00	00:00
15	J34	5,674.00	0.00	5,971.97	129.11	0.00	00:00	0.00	00:00
16	J36	5,739.00	0.00	5,972.02	100.97	0.00	00:00	0.00	00:00
17	J38	5,847.00	0.00	5,981.26	58.17	0.00	00:00	0.00	00:00
18	J40	5,853.00	0.00	5,980.87	55.41	0.00	00:00	0.00	00:00
19	J42	5,839.00	11.66	5,980.05	61.12	11.66	00:00	11.66	00:00
20	J44	5,833.00	0.00	5,979.95	63.67	0.00	00:00	0.00	00:00
21	J46	5,799.00	0.00	5,979.54	78.23	0.00	00:00	0.00	00:00
22	J48	5,781.00	0.00	5,979.40	85.97	0.00	00:00	0.00	00:00
23	J50	5,763.00	29.68	5,979.16	93.66	29.68	00:00	29.68	00:00
24	J52	5,769.00	0.00	5,978.92	90.96	0.00	00:00	0.00	00:00
25	J55	5,762.00	0.00	5,978.72	93.90	0.00	00:00	0.00	00:00
26	J56	5,751.00	0.00	5,978.57	98.60	0.00	00:00	0.00	00:00
27	J58	5,751.00	47.70	5,978.51	98.58	47.70	00:00	47.70	00:00
28	J63	5,664.00	0.00	5,977.70	135.92	0.00	00:00	0.00	00:00
29	J62	5,730.00	0.00	5,977.09	107.06	0.00	00:00	0.00	00:00
30	J64	5,751.00	0.00	5,976.80	97.84	0.00	00:00	0.00	00:00
31	J66	5,759.00	0.00	5,976.68	94.32	0.00	00:00	0.00	00:00
32	J68	5,763.00	0.00	5,976.50	92.51	0.00	00:00	0.00	00:00
33	J70	5,774.00	0.00	5,976.23	87.63	0.00	00:00	0.00	00:00
34	J72	5,773.00	0.00	5,976.08	87.99	0.00	00:00	0.00	00:00
35	J74	5,774.00	0.00	5,975.65	87.38	0.00	00:00	0.00	00:00
36	J76	5,736.00	0.00	5,974.78	103.46	0.00	00:00	0.00	00:00
37	J78	5,714.00	0.00	5,974.62	112.93	0.00	00:00	0.00	00:00
38	J80	5,663.00	0.00	5,974.85	135.12	0.00	00:00	0.00	00:00
39	J82	5,667.00	0.00	5,975.08	133.49	0.00	00:00	0.00	00:00
40	J85	5,701.00	6.36	5,975.70	119.03	6.36	00:00	6.36	00:00
41	J88	5,742.00	0.00	5,976.01	101.40	0.00	00:00	0.00	00:00
42	J90	5,757.00	0.00	5,976.39	95.06	0.00	00:00	0.00	00:00
43	J92	5,768.00	0.00	5,976.67	90.41	0.00	00:00	0.00	00:00
44	J96	5,789.00	0.00	5,977.68	81.75	0.00	00:00	0.00	00:00
45	J98	5,795.00	0.00	5,978.26	79.40	0.00	00:00	0.00	00:00
46	J100	5,805.00	0.00	5,978.85	75.33	0.00	00:00	0.00	00:00
47	J79	5,700.00	0.00	5,974.56	118.97	0.00	00:00	0.00	00:00
48	J106	5,784.00	0.00	5,977.30	83.76	0.00	00:00	0.00	00:00

	JUNCTION: ID (Char)	JUNCTION: ELEVATION (Real)	OUTPUT: DEMAND (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PRESSURE (psi)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
49	J108	5,813.00	27.56	5,979.57	72.18	27.56	00:00	27.56	00:00
50	J110	5,774.00	33.92	5,976.40	87.70	33.92	00:00	33.92	00:00

NWDC - Water Project - Alt. 3 - Pipe Report - Peak Hour Demand

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	P11	J12	RWSD-WTP	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
2	P13	J12	PVHWEST	0.00	0.00	0.00	0.00	Open	0.00	00:00	0.00	00:00
3	P15	PVHWEST	PVHEAST	-15.91	0.18	0.10	0.03	Open	15.91	00:00	15.91	00:00
4	P17	PVHEAST	J14	-151.26	0.43	0.65	0.08	Open	151.26	00:00	151.26	00:00
5	P19	J14	TRIPDEMANDNODE	-151.26	0.43	0.09	0.08	Open	151.26	00:00	151.26	00:00
6	P21	TRIPDEMANDNODE	J18	-229.70	0.65	0.05	0.17	Open	229.70	00:00	229.70	00:00
7	P23	J18	J20	-229.70	0.65	0.25	0.17	Open	229.70	00:00	229.70	00:00
8	P25	J20	J22	-229.70	0.65	0.17	0.17	Open	229.70	00:00	229.70	00:00
9	P27	J22	J24	-229.70	0.65	0.25	0.17	Open	229.70	00:00	229.70	00:00
10	P29	J24	J26	217.63	0.62	0.53	0.15	Open	217.63	00:00	217.63	00:00
11	P31	J26	J28	217.63	0.62	0.45	0.15	Open	217.63	00:00	217.63	00:00
12	P33	J28	FUTUREBUSINESS	217.63	0.62	1.20	0.15	Open	217.63	00:00	217.63	00:00
13	P35	FUTUREBUSINESS	J32	-120.51	0.34	0.20	0.05	Open	120.51	00:00	120.51	00:00
14	P37	J32	J34	-120.51	0.34	0.02	0.05	Open	120.51	00:00	120.51	00:00
15	P39	J34	J36	-120.51	0.34	0.05	0.05	Open	120.51	00:00	120.51	00:00
16	P41	J36	PVHEAST	-120.51	0.34	0.45	0.05	Open	120.51	00:00	120.51	00:00
17	P45	J38	J40	604.21	1.71	0.39	1.00	Open	604.21	00:00	604.21	00:00
18	P47	J40	J42	604.21	1.71	0.83	1.00	Open	604.21	00:00	604.21	00:00
19	P49	J42	J44	592.55	1.68	0.10	0.96	Open	592.55	00:00	592.55	00:00
20	P51	J44	J46	126.21	0.81	0.41	0.40	Open	126.21	00:00	126.21	00:00
21	P53	J46	J48	126.21	0.81	0.14	0.40	Open	126.21	00:00	126.21	00:00
22	P55	J48	J50	126.21	0.81	0.24	0.40	Open	126.21	00:00	126.21	00:00
23	P57	J50	J52	96.53	0.62	0.24	0.24	Open	96.53	00:00	96.53	00:00
24	P59	J52	J55	96.53	0.62	0.21	0.24	Open	96.53	00:00	96.53	00:00
25	P61	J55	J56	96.53	0.62	0.15	0.24	Open	96.53	00:00	96.53	00:00
26	P63	J56	J58	232.26	1.48	0.06	1.22	Open	232.26	00:00	232.26	00:00
27	P65	J58	J63	184.56	1.18	0.81	0.80	Open	184.56	00:00	184.56	00:00
28	P67	J63	J62	184.56	1.18	0.61	0.80	Open	184.56	00:00	184.56	00:00
29	P69	J62	J64	184.56	1.18	0.28	0.80	Open	184.56	00:00	184.56	00:00
30	P71	J64	J66	184.56	1.18	0.12	0.80	Open	184.56	00:00	184.56	00:00
31	P73	J66	J68	184.56	1.18	0.18	0.80	Open	184.56	00:00	184.56	00:00
32	P75	J68	J70	184.56	1.18	0.27	0.80	Open	184.56	00:00	184.56	00:00
33	P77	J70	J72	265.87	1.70	0.16	1.57	Open	265.87	00:00	265.87	00:00
34	P79	J72	J74	265.87	1.70	0.43	1.57	Open	265.87	00:00	265.87	00:00
35	P81	J74	J76	265.87	1.70	0.88	1.57	Open	265.87	00:00	265.87	00:00
36	P83	J76	J78	265.87	1.70	0.16	1.57	Open	265.87	00:00	265.87	00:00
37	P85	J78	J80	-181.46	1.16	0.23	0.77	Open	181.46	00:00	181.46	00:00
38	P87	J80	J82	-181.46	1.16	0.22	0.77	Open	181.46	00:00	181.46	00:00
39	P89	J82	J85	-181.46	1.16	0.62	0.77	Open	181.46	00:00	181.46	00:00
40	P95	J88	J90	-187.82	1.20	0.38	0.83	Open	187.82	00:00	187.82	00:00
41	P97	J90	J92	-187.82	1.20	0.28	0.82	Open	187.82	00:00	187.82	00:00
42	P99	J92	J106	-303.04	1.93	0.63	2.00	Open	303.04	00:00	303.04	00:00
43	P103	J96	J98	-303.04	1.93	0.58	2.00	Open	303.04	00:00	303.04	00:00
44	P105	J98	J100	-303.04	1.93	0.60	2.00	Open	303.04	00:00	303.04	00:00
45	P107	J100	J44	-303.04	1.93	1.09	2.00	Open	303.04	00:00	303.04	00:00
46	P109	J78	J79	447.33	1.27	0.06	0.57	Open	447.33	00:00	447.33	00:00
47	P111	J79	J24	447.33	1.27	0.63	0.57	Open	447.33	00:00	447.33	00:00

	PIPE: ID (Char)	OUTPUT: FROM_NODE	OUTPUT: TO_NODE	OUTPUT: FLOW (gpm)	OUTPUT: VELOCITY (ft/s)	OUTPUT: HEADLOSS (ft)	OUTPUT: HL_1000 (ft/kft)	OUTPUT: STATUS	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
48	P119	J106	J96	-303.04	1.93	0.38	2.00	Open	303.04	00:00	303.04	00:00
49	P121	J88	J85	187.82	1.20	0.32	0.82	Open	187.82	00:00	187.82	00:00
50	P123	J38	TANK1	-604.21	1.71	2.99	1.00	Open	604.21	00:00	604.21	00:00
51	P125	J44	J108	163.29	1.04	0.38	0.64	Open	163.29	00:00	163.29	00:00
52	P127	J108	J56	135.73	0.87	1.01	0.45	Open	135.73	00:00	135.73	00:00
53	P129	J92	J110	115.22	0.74	0.26	0.33	Open	115.22	00:00	115.22	00:00
54	P131	J110	J70	81.30	0.52	0.17	0.18	Open	81.30	00:00	81.30	00:00

NWDC - Water Project - Alt. 3 - Tank Report - Peak Hour Demand

	TANK: ID (Char)	TANKHYD: ELEVATION (Real)	TANKHYD: DIAMETER (Real)	TANKHYD: MAX_LEVEL (Real)	TANKHYD: MIN_LEVEL (Real)	TANKHYD: INIT_LEVEL (Real)	OUTPUT: FLOW (gpm)	OUTPUT: HEAD (ft)	OUTPUT: PERCENT (%)	OUTPUT: LEVEL (ft)	RANGE: MAX_VALUE (gpm)	RANGE: MAX_TIME (hrs.)	RANGE: MIN_VALUE (gpm)	RANGE: MIN_TIME (hrs.)
1	TANK1	5,960.00	73.52	24.25	0.00	24.25	-604.21	5,984.25	100.00	24.25	-604.21	00:00	-604.21	00:00

NWDC - Water Project - Alt. 3 - Fire Flow Analysis

	ID	Total Demand (gpm)	Critical Fire Node ID	Critical Fire Node Pressure (psi)	Critical Fire Node Head (ft)	Design Flow (gpm)
1	FUTUREBUSINESS	1,725.53	FUTUREBUSINESS	38.00	5,830.69	1,989.72
2	J100	1,500.00	J100	50.65	5,921.90	2,562.72
3	J106	1,500.00	J106	52.91	5,906.12	2,403.62
4	J14	1,500.00	J22	44.96	5,863.77	1,959.29
5	J18	1,500.00	J22	44.76	5,863.30	1,953.91
6	J20	1,500.00	J22	44.48	5,862.64	1,946.61
7	J22	1,500.00	J22	44.20	5,862.01	1,939.74
8	J24	1,500.00	J22	47.34	5,869.26	2,025.11
9	J26	1,500.00	FUTUREBUSINESS	48.69	5,855.37	1,991.79
10	J28	1,500.00	FUTUREBUSINESS	45.30	5,847.55	1,912.56
11	J32	1,500.00	J36	40.20	5,831.77	1,794.60
12	J34	1,500.00	J36	39.96	5,831.23	1,790.20
13	J36	1,500.00	J36	39.30	5,829.69	1,777.72
14	J38	1,500.00	J40	42.41	5,950.88	3,081.74
15	J40	1,500.00	J40	41.09	5,947.83	2,864.44
16	J42	1,507.78	J42	44.16	5,940.91	2,782.24
17	J44	1,500.00	J42	44.16	5,940.91	2,774.46
18	J46	1,500.00	J46	51.67	5,918.25	2,476.74
19	J48	1,500.00	J46	52.78	5,920.80	2,553.14
20	J50	1,519.80	J50	63.41	5,909.34	2,635.58
21	J52	1,500.00	J52	59.82	5,907.05	2,511.25
22	J55	1,500.00	J55	64.03	5,909.78	2,657.25
23	J56	1,500.00	J42	44.16	5,940.91	2,774.46
24	J58	1,531.81	J42	44.16	5,940.91	2,806.29
25	J62	1,500.00	J70	56.65	5,904.74	2,501.96
26	J63	1,500.00	J70	59.53	5,911.39	2,681.50
27	J64	1,500.00	J70	55.32	5,901.68	2,428.66
28	J66	1,500.00	J70	54.76	5,900.37	2,398.70
29	J68	1,500.00	J70	53.87	5,898.33	2,353.96
30	J70	1,500.00	J70	52.56	5,895.30	2,290.88
31	J72	1,500.00	J74	51.67	5,893.25	2,258.01
32	J74	1,500.00	J74	49.25	5,887.66	2,160.25
33	J76	1,500.00	J22	51.75	5,879.43	2,163.59
34	J78	1,500.00	J22	51.11	5,877.96	2,139.44
35	J79	1,500.00	J22	50.80	5,877.23	2,129.27
36	J80	1,500.00	J22	52.20	5,880.48	2,181.13
37	J82	1,500.00	J22	53.21	5,882.80	2,218.95
38	J85	1,504.24	J22	55.88	5,888.97	2,329.75
39	J88	1,500.00	J74	54.14	5,898.95	2,369.23
40	J90	1,500.00	J90	59.05	5,893.27	2,396.17
41	J92	1,500.00	J92	57.78	5,901.36	2,462.74
42	J96	1,500.00	J96	52.17	5,909.39	2,422.99
43	J98	1,500.00	J98	51.99	5,914.99	2,491.59
44	PVHEAST	1,509.90	J36	44.67	5,842.10	1,895.47
45	TRIPDEMANDNODE	1,552.32	J22	44.81	5,863.41	2,007.82

Appendix D

Plum Valley Heights Subdistrict of the Roxborough Water and Sanitation District
Estimated Cash Flow 2014-2036

Estimated Revenue

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	Total
PVHSD Grant			50,000																					50,000
RWSD Transfer of Funds	50,000																							50,000
Loan Financing Fees (DC)	50,000	250,000																						300,000
Douglas County Costs Advanced			1,688,411	1,688,411																				3,376,822
Tap Fees PVHSD				2,219,869	1,687,100	1,664,902																		5,571,871
Inclusion Fees PVHSD			125,500																					125,500
CWCB Loan Proceeds PVHSD			2,226,245																					2,226,245
CWPDRA Loan Proceeds PVHSD			5,200,000																					5,200,000
Douglas County Engineering Subsidy	70,000	574,000	250,000	250,000																				1,144,000
Property Taxes PVHSD				380,952	384,762	388,609	392,495	396,420	400,384	404,388	408,432	412,516	416,642	420,808	425,016	429,266	433,559	437,895	442,273	446,696	451,163	455,675	460,232	8,388,184
PVHSD Surcharge			188,250	225,900	228,159	230,441	232,745	235,072	237,423	239,797	242,195	244,617	247,064	249,534	252,029	254,550	257,095	259,666	262,263	264,886	267,534	204,564	204,564	5,028,349
Total Estimated Revenue	170,000	824,000	9,728,406	4,765,132	2,300,021	2,283,952	625,240	631,493	637,808	644,186	650,627	657,134	663,705	670,342	677,046	683,816	690,654	697,561	704,536	711,582	718,698	660,239	664,796	31,460,971

Estimated Expenses

Douglas County Tap Fees				1,464,869	1,113,300	1,098,652																		3,676,821
RWSD Fees			125,500	755,000	573,800	566,250																		2,020,550
Loan Financing Fees	50,000	250,000																						300,000
Engineering Fees	70,000	574,000	250,000	250,000																				1,144,000
Election Costs	30,000																							30,000
Water Supply			1,236,803	1,236,802																				2,473,605
PVHSD Construction Project			4,157,231	4,157,231																				8,314,462
CWPDRA PVHSD Debt Service				380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	380,952	7,619,040
CWCB- PVHSD Debt Service				133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	133,272	2,665,440
Total Estimated Expenses	150,000	824,000	5,769,534	8,378,126	2,201,324	2,179,126	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	514,224	28,243,918
Estimated Annual Cash Flow	20,000	0	3,958,872	-3,612,994	98,697	104,826	111,016	117,269	123,584	129,962	136,403	142,910	149,481	156,118	162,822	169,592	176,430	183,337	190,312	197,358	204,474	146,015	150,572	3,217,053
Cumulative	20,000	20,000	3,978,872	365,878	464,575	569,400	680,416	797,685	921,269	1,051,230	1,187,634	1,330,544	1,480,025	1,636,143	1,798,964	1,968,556	2,144,987	2,328,323	2,518,636	2,715,993	2,920,467	3,066,482	3,217,053	

Appendix E

INTERGOVERNMENTAL AGREEMENT FOR SUPPLY OF UP TO 150 ACRE-FEET OF WATER BETWEEN ROXBOROUGH WATER AND SANITATION DISTRICT, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE AND THE CITY OF AURORA, ACTING BY AND THROUGH ITS UTILITY ENTERPRISE

This Intergovernmental Agreement for the supply of up to 150 acre-feet of raw water ("150 IGA") is executed this 15th day of October, 2014, by and between the Roxborough Water and Sanitation District (previously known as Roxborough Park Metropolitan District), acting by and through its Water Enterprise ("District" or "Roxborough"), and the City of Aurora, acting by and through its Utility Enterprise ("Aurora"), jointly ("Parties"). The Execution Date of this 150 IGA, is the date inserted above. While this IGA is binding upon the Parties as of the Execution Date, the Parties' performance pursuant to this IGA will commence on the Effective Date which is January 1, 2015.

WITNESSETH

WHEREAS, the Parties have previously entered into various agreements concerning water and water supply and as a result of the performance thereof, the Parties have determined that it is in their best interest to enter into the following agreement; and

WHEREAS, this 150 IGA is entered into pursuant to C.R.S. 29-1-201 *et seq.* with each of the Parties a Political Subdivision in the State of Colorado, and with Roxborough, a Special District organized and existing pursuant to the provisions of C.R.S. 32-1-101 *et seq.*, whose current location and boundaries are described in the attached **Exhibit 1**, and Aurora, a home rule City pursuant to Article XX of the Colorado Constitution, acting by and through its Utility Enterprise; and

WHEREAS, Roxborough joined the South Metro Water Supply Authority ("Authority") in 2002 with the express purpose of exploring solutions to its long-term water supply needs; and

WHEREAS, the Authority entered into a Memorandum of Understanding on November 20, 2008, with Aurora and the City and County of Denver, acting by and through its Board of Water Commissioners ("Denver Water") to implement a cooperative study to identify water resources including infrastructure that might be available for a joint water supply project to facilitate efficient and cost effective delivery of water to a variety of users; and

WHEREAS, Aurora, Denver Water and the Authority entered into an Intergovernmental Agreement dated May 13, 2009, regarding the leasing of water and infrastructure to be used within a regional water supply project in forming the Water, Infrastructure and Supply Efficiency Partnership, which Agreement acknowledges that Aurora and Roxborough may conduct other discussions and conclude other agreements; and

WHEREAS, Douglas County has established a water activity enterprise to assist in facilitating development of renewable water in that County for the propose of reducing its inhabitants dependence on nonrenewable groundwater supplies; and

WHEREAS, Roxborough wishes to use the water it may obtain under this 150 IGA to help a small discrete portion of Douglas County to assist in alleviating perceived emergency circumstances concerning water supply to certain specific properties identified herein that are proximate to Roxborough known as Plum Valley Heights, Chatfield East, Chatfield Estates, Titan Road Industrial Park, and the areas generally adjacent (collectively referred to herein as the "150 Service Area") which 150 Service Area is specifically described in the attached **Exhibit 2**.

NOW THEREFORE, in consideration of the mutual promises and benefits described herein, the adequacy and sufficiency of which are hereby acknowledged, Aurora and Roxborough agree as follows:

1. Term. The primary term of this 150 IGA shall be ninety (90) years from the Effective Date hereof, January 1, 2015, and this 150 IGA shall automatically and continuously renew thereafter for an additional ninety (90) years on the same terms and conditions as contained herein.

2. Time Within Which to Initiate Operations by Payment of the Development and Connection Fee or Otherwise Terminate this 150 IGA. The Parties agree that Roxborough will have until five (5) years following the Effective Date of this 150 IGA, January 1, 2015, in which to initiate operations for up to a total amount of 150 acre-feet of raw water per year from Aurora per the terms described in this 150 IGA. Any such initiation will require the payment of the Development and Connection Fee (described in Paragraph 10 hereinafter) that is required therefor. If Roxborough does not initiate operations by paying the required Development and Connection Fee for a requested portion of the raw water made available by Aurora pursuant to this 150 IGA before the expiration of the aforesaid five (5) year period (i.e. midnight on December 31, 2020), then its rights to receive any raw water hereunder shall expire and this 150 IGA shall be null and void. Any decision by Roxborough to initiate operations by paying the Development and Connection Fee for any requested amount of raw water shall be pursuant to the notice provisions hereinafter set forth. Any portion of the raw water that may be available to Roxborough pursuant to this 150 IGA for which operations are not initiated by the payment of the required Development and Connection Fee within the five (5) year period shall not be available to Roxborough following such five (5) year period. The Parties however acknowledge that upon timely payment of the Development and Connection Fee within the five (5) year period, the actual physical delivery of the water for that portion so paid may commence at any time in the future (either within or beyond the five (5) year period) as may be convenient and agreed upon by the Parties.

3. Total Water Delivery, Location of Use and Rate of Delivery. Aurora agrees to deliver raw water to Roxborough pursuant to the terms and conditions set forth in this 150 IGA. Roxborough acknowledges and agrees that only up to a total of 150 acre-feet of raw water per year will be delivered by Aurora to Roxborough and the only parties that may receive this water by or through Roxborough are those parties whose property both 1) lies within the boundaries of the 150 Service Area, which area is within Douglas County, Colorado, and 2) is included within Roxborough's district boundaries. The amount of raw water supplied to Roxborough pursuant to this 150 IGA by Aurora will be limited for all time to a maximum of 150 acre-feet per year, provided the full rate of such raw water delivery in combination with

the flow rate of any water delivered pursuant to any other agreement between Roxborough and Aurora does not exceed 6 MGD. Roxborough further agrees that raw water supplied by Aurora pursuant to this 150 IGA is supplied exclusively for use only within the 150 Service Area as set forth on **Exhibit 2.** No additional land may be included within the boundaries of the 150 Service Area. The total raw water delivery by Aurora pursuant to this 150 IGA shall never exceed 150 acre-feet per year and this maximum 150 acre-foot annual cap on deliveries applies in all circumstances regardless of any need or excess demand by Roxborough or the 150 Service Area.

4. Water Quality. Aurora makes no representation or warranty as to the quality of water delivered under this 150 IGA; provided that any raw water delivered under this 150 IGA is deliverable at the South Platte River above the Chatfield Reservoir.

5. Declaration of Restrictions. This 150 IGA contemplates the furnishing of raw water outside the city limits of the City of Aurora. However, it may become necessary for Aurora to limit or restrict the use of water inside the currently or future defined Aurora service area. In such case of any restrictions within the City of Aurora, the District agrees it shall impose the same or more stringent water-use limits or restrictions on all of its customers and the entire service area permitted by this 150 IGA including the 150 Service Area. Any such limitation or restriction imposed within the City of Aurora shall be at the sole discretion of Aurora, and such determination of same shall be based on valid reasons and approved by the City's governing body, its City Council. Aurora's limitations or restrictions will be in compliance with the applicable Aurora Water Management Plan, which is adopted from time to time by Aurora's City Council. The Aurora Water Management Plan will be made available to the District upon request. The District acknowledges that modifications may be made periodically throughout any year by Aurora to the Aurora Water Management Plan and those modifications may result in more stringent restrictions.

6. No Reuse of Delivered Water. It is agreed that all raw water provided to Roxborough by Aurora pursuant to this 150 IGA will be treated as single-use only by Roxborough and/ or the 150 Service Area. Any and all rights for successive use, re-use, and use to extinction are reserved by Aurora. If Aurora pursuant to this 150 IGA, at its discretion, delivers any reusable water to Roxborough, it is further agreed that Aurora may recapture any of the return flows from Roxborough's initial use of that reusable supply, including use by the 150 Service Area. Further Roxborough agrees that as a condition of water service to the 150 Service Area the property owners will be required to provide reasonable access to their property as may be required for Aurora to obtain this reusable water if said reusable water can be reasonably recovered. In no instance shall Roxborough, including the 150 Service Area, be allowed multiple use of any raw water supplied under this 150 IGA.

7. Delivery. Aurora agrees to deliver to the District, on the terms and conditions herein contained, up to the maximum specified amount of raw water to a tap that is currently located within the Roxborough Water Treatment Plant site and to a tap currently located at a location near the existing Rampart Reservoir, from which the District may serve the 150 Service Area. Aurora will maintain raw water meters at these taps within existing vaults or facilities that have been

or will be supplied by the District. Aurora will continue to maintain these meters and Aurora shall have permanent access to such vaults or facilities and meters.

8. Payment Rate. It is agreed that the initial rate to be paid by Roxborough to Aurora will be $3.77 per 1,000 gallons of raw water delivered to the aforementioned meter by Aurora. This rate is based upon the 2010 raw water service rate developed through a cost of service model and City Council policy applicable to the provision of service out of the City boundaries. Following the Effective Date of this 150 IGA, January 1, 2015, that rate shall increase annually in an amount equal to seventy percent (70%) of the percentage increase in Aurora's treated water user rates charged within its service area. The rate applicable at the execution of this 150 IGA will be the 2010 baseline of $3.77 per thousand gallons. The District will be notified of such increase no later than December 15 and any increases will take effect on January 1 of the year immediately following.

9. Billing. Aurora shall read the meters described in Paragraph 7 above once a month and shall bill the District for the amount of raw water run through its meters during the preceding month at the applicable rate. The District further agrees to pay Aurora the amount of such statements within fifteen (15) days after receipt of billing.

10. Development and Connection Fee. Upon the date Roxborough notifies Aurora pursuant to Paragraph 2 hereinabove that it wishes to begin taking raw water deliveries under this 150 IGA, the District will pay Aurora a Development and Connection Fee. Per the terms of this 150 IGA, Roxborough may not pay the Development and Connection Fee prior to January 1, 2015. Aurora will provide to Roxborough by December 15, 2014, the amount for this Development and Connection Fee on a per residential equivalent unit ("REU") basis; this amount will not exceed $9,855.00 per each REU to be served within the boundaries of the 150 Service Area. The amount of the Development and Connection Fee will escalate in subsequent years by the cumulative percentage increases in the City of Aurora's water fund development fee during that time between Aurora's December 15, 2014, initial notification of the amount of the Development and Connection Fee and the subsequent periodic initiation of operations by payment of the Development and Connection Fee by Roxborough. The Parties agree there will be a maximum of three hundred sixteen (316) REUs at full build-out of the 150 Service Area. For every year after the year 2015, the District will report to Aurora all additional REUs developed in the 150 Service Area that year, on or before February 1 of the following year. The District will pay the Development and Connection Fee, on or before March 1 of such year, for each additional REU up to the maximum build-out number of three hundred sixteen (316) at the then applicable rate as adjusted for any additional increases in the City of Aurora's water fund development fee since Aurora's December 15, 2014, initial notification of the amount for the Development and Connection Fee. Regardless of the number of REUs existing at any particular time, the additional Development and Connection Fee for the build-out maximum of three hundred sixteen (316) REUs must be paid to Aurora in total if in any year Aurora delivers a total 150 acre-feet per year of raw water to Roxborough pursuant to this 150 IGA. The District will be notified of the succeeding year's water fund development fee increase, if any, no later than December 15 of the prior year. Regardless of the number of actual REUs connected to the District's system within the 150 Service Area, the District shall only be permitted to pay the applicable Development and Connection Fee for up to three hundred

sixteen (300) REUs and only during the five (5) year period following January 1, 2015, as described in Paragraph 2 hereinabove.

11. Notice. For purposes of notice pursuant to this 150 IGA the Parties' representatives shall be:

For the District:	Manager, Roxborough Water and Sanitation District 6222 North Roxborough Park Road Littleton, CO 80125
For Aurora:	Director of Water Resources City of Aurora 15151 E. Alameda Parkway, #3600 Aurora, CO 80012

Any notices required or permitted to be given hereunder shall be in writing and shall be deemed given when given personally or sent by certified or registered mail, return receipt requested, postage prepaid. Either party hereto may designate a new address by giving written notice thereof to the other party hereto in the aforesaid manner. Notice shall be effective upon receipt.

12. No Assignment or Delegation. Neither party may assign its rights nor delegate its duties hereunder without the prior written consent of the other.

13. Indemnification. To the extent it lawfully may, the District shall defend, indemnify, and hold harmless, Aurora and its officers, agents, and employees against any liability, loss, damage, demand, action, or cause of action of third party which may occur as a result of the delivery of water by Aurora under this 150 IGA, except as to any portion of negligence judicially determined to be caused by Aurora. This includes, but is not limited to, any damages which may result from the transportation of water under this 150 IGA by means of any water carriage facilities or existing or future infrastructure. No provision of this 150 IGA shall be construed as a waiver or release of the immunities, limitations, or defenses afforded to Aurora or the District under the Colorado Governmental Immunity Act.

14. Amendments. Amendments to this 150 IGA shall only be effective if entered into with the same formality as this 150 IGA.
15. Venue and Governing Law. The forum for resolution of any dispute resulting in litigation regarding this 150 IGA shall be the District Court for the County of Arapahoe. This 150 IGA shall be governed by and construed under the laws of the State of Colorado.

16. Waiver of Rights. The failure of either party to exercise any right under this 150 IGA shall not be deemed a waiver of such party's right and shall not affect the right of such party to exercise at some future time the right or rights or any other right it may have under this 150 IGA.

17. Headings and Captions. The headings and captions in this 150 IGA are for convenience of reference only, are not part of this 150 IGA and shall not define or limit any of the terms or provisions hereof.

18. Failure to Perform Due to Force Majeure. Subject to the terms and conditions in this Paragraph, no party to this 150 IGA shall be liable for any delay or failure to perform under this 150 IGA due solely to conditions or events of force majeure, as that term is specifically defined herein; provided that: (i) the non-performing party gives the other party prompt written notice describing the particulars of the occurrence of the force majeure; (ii) the suspension of performance is of no greater scope and of no longer duration than is required by the force majeure event or condition; and (iii) the non-performing party proceeds with reasonable diligence to remedy its inability to perform and provides weekly progress reports to the other party describing the actions taken to remedy the consequences of the force majeure event or condition. As used herein force majeure shall mean any delay or failure of a party to perform its obligations under this 150 IGA caused by events beyond the party's reasonable control and without the fault or negligence of the party, including, without limitation (a) acts of God, (b) sudden actions of the elements such as floods, earthquakes, rock slides, avalanches, hurricanes, or tornadoes, (c) sabotage, (d) vandalism beyond that which can be reasonably prevented by the Party, (e) terrorism, (f) war, (g) riots, (h) fire, (i) explosion, (j) severe cold or hot weather, (k) extreme snow, (l) drought such that Aurora determines that a Stage III Water Availability Condition Response (or more severe) exists as said Stages are described in the Aurora Water 2010, and subsequently adopted Water Management Plan), (m) blockades, (n) insurrection, (o) strike, slow down or labor disruptions (even if such difficulties could be resolved by conceding to the demands of a labor group), (p) changes of law relating to financial obligations, revenues and budgetary matters concerning Colorado local governments and their enterprises, (q) actions by federal, state, municipal, or any other government or agency (including but not limited to, the adoption or change in any rule or regulation, compact calls, revised compact administration or environmental constraint, imposed by, or in any contract with, any federal, state or local government bodies) but only if such requirements, actions, or failures to act prevent or delay performance, (r) changes in state or federal law or administrative practice concerning water rights administration, water storage, water quality or stream flow requirements, and (s) inability, despite due diligence, to obtain required licenses, permits or approvals.

19. Enforcement. This 150 IGA may be enforced in law or equity, by a decree of specific performance, damages, or such other legal and equitable relief as may be available to a party.

20. Defense Against Third Parties. In the event of litigation by any third party concerning this 150 IGA, and to the extent permitted by law, the Parties agree to jointly defend any such third party action.

21. No Third Party Beneficiaries. Except as otherwise explicitly provided for herein, there are no third party beneficiaries of this 150 IGA. No third party, including the 150 Service Area or property owners therein has any right to enforce this 150 IGA.

22. Sole Obligation of Utility Enterprise.

1. This 150 IGA shall never constitute a general obligation or other indebtedness of the City of Aurora, or a multiple fiscal year direct or indirect debt or other financial obligation

whatsoever of the City of Aurora within the meaning of the Constitution and laws of the State of Colorado or of the Charter and ordinances of the City of Aurora.

2. In the event of a default by Aurora's Utility Enterprise of any of its obligations under this 150 IGA, Roxborough shall have no recourse for any amounts owed to it against any funds or revenues of the City of Aurora except for those revenues derived from rates, fees or charges for the services furnished by, or the direct or indirect use of, the Water System and deposited in the Water Enterprise Fund, as the terms "Water System" and "Water Enterprise Fund" are defined in City Ordinance No. 2003-18, and then only after the payment of all operation and maintenance expenses of the Water System and all debt service and reserve requirements of any bonds, notes, or other financial obligations of the Utility Enterprise secured by a pledge of the net revenues of the Water Enterprise Fund. Notwithstanding any language herein to the contrary, nothing in this 150 IGA shall be construed as creating a lien upon any revenues of the Utility Enterprise or the City of Aurora.

3. Aurora represents that this 150 IGA has been duly authorized, executed and delivered by Aurora and constitutes a valid and legally binding obligation of Aurora, enforceable against Aurora in accordance with the terms hereof, subject only to the terms hereof and to applicable bankruptcy, insolvency and similar laws affecting the enforceability of the rights of creditors generally and to general principles of equity.

23. No Transfer of Ownership. Except as specifically stated herein nothing in this 150 IGA shall constitute or be interpreted as constituting the transfer of any ownership interests in the infrastructure assets or water rights of the Parties. Each party shall remain individually responsible for the operation, maintenance, repair and replacement of their infrastructure and water rights absent express written agreement to the contrary.

24. Binding Agreement. This 150 IGA, when executed, shall inure to the benefit of and be binding on the successors and assigns of the respective Parties hereto if any are allowed.

25. Entire Agreement. This 150 IGA represents the entire agreement of the Parties and neither party has relied upon any fact or representation not expressly set forth herein.

26. Multiple Originals. This 150 IGA may be simultaneously executed in any number of counterparts each of which shall be deemed original but all of which constitute one and the same agreement.

27. Non-severability and Affect of Invalidity. Each provision of this 150 IGA is intertwined with and integral to the others and is not severable from the others. If any portion of this 150 IGA is held invalid or unenforceable for any reason by a court of competent jurisdiction as to either party or as to both Parties, the Parties will immediately attempt to negotiate either valid alternative portions that as near as possible give effect to any stricken portions or a valid replacement agreement.

28. No Attorney's Fees and Costs. In the event of any litigation arising out of this 150 IGA, the Parties agree that each will be responsible for their own attorney's fees and costs associated with any such legal action.

29. Joint Draft. The Parties agree they drafted this 150 IGA jointly with each having the advice of legal counsel and an equal opportunity to contribute to its content. Therefore, this 150 IGA shall not be construed for or against a party on the basis of authorship.

30. Intent of 150 IGA. This 150 IGA is intended to describe the rights and responsibilities of and between the Parties and is not intended to and shall not be deemed to confer rights upon any persons or entities not signatories hereto nor to limit, impair, or enlarge in any way the powers, regulatory authority and responsibilities of either party or any other governmental entity not a party hereto.

31. Non-Business Days. If any date for any action under this 150 IGA falls on a Saturday, Sunday or a day that is a "holiday" as such term is defined in Rule 6 of the Colorado Rules of Civil Procedure, then the relevant date shall be extended automatically until the next business day.

32. Prohibition on Sale or Transfer. During this 150 IGA, Roxborough may not sell, lease or otherwise transfer or alienate any of the water supplied by Aurora, absent the consent of Aurora hereto. Water that Roxborough may supply to customers within its boundaries, including those within the 150 Service Area will not be considered a violation of this prohibition.

33. No Amendments of Any Previous Agreements. This 150 IGA and nothing herein amends or modifies any previous agreement, contract or intergovernmental agreement between these parties, including but not limited to any agreements, contract or intergovernmental agreements mentioned or described herein and that INTERGOVERNMENTAL AGREEMENT FOR WATER SUPPLY BETWEEN THE ROXBOROUGH WATER AND SANITATION DISTRICT, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE AND THE CITY OF AURORA, ACTING BY AND THROUGH ITS UTILITY ENTERPRISE with Execution Date of December 20, 2010.

IN WITNESS WHEREOF, the Parties hereby have hereunto placed their hands and seals on the dates written below.

CITY OF AURORA, COLORADO,
ACTING BY AND THROUGH ITS
UTILITY ENTERPRISE

Stephen D. Hogan, Mayor — 10-6-14 Date

ATTEST:

Janice Napper, City Clerk — 10-7-14 Date

APPROVED AS TO FORM FOR AURORA:

Christine McKenney, Assistant City Attorney — 7/30/2014 Date — 14031842 ACS#

John M. Dingess, Special Counsel — July 30, 2014 Date

STATE OF COLORADO)
) ss
COUNTY OF ARAPAHOE)

The foregoing instrument was acknowledged before me this 6th day of October 2014, by Stephen D. Hogan, Mayor acting on behalf of the Utility Enterprise of the City of Aurora, Colorado.

Witness my hand and official seal.

Notary Public

My commission expires: 04/20/2016

(SEAL)

JEAN M RUSSELL
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID 20004011854
MY COMMISSION EXPIRES 04/20/2016

ROXBOROUGH WATER AND SANITATION DISTRICT
ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE

David Bane, President — Date: 10/15/14

Attest:

~~Tim Moore, Secretary~~
DAVE THOMAS, VICE-PRESIDENT — Date: 10/15/14

APPROVED AS TO FORM FOR ROXBOROUGH:

Alan D. Pogue, General Counsel — Date: 15 OCTOBER 2014

STATE OF COLORADO)
) ss
COUNTY OF DOUGLAS)

The foregoing instrument was acknowledged before me this 15th day of October, 2014, by David Bane, President, and attested to by ~~Tim Moore~~, as ~~Secretary~~, acting on behalf of the Roxborough Water and Sanitation District acting by and through its Water Activity Enterprise.

Witness my hand and official seal. Victoria C. Nolen
Notary Public

My commission ~~expires~~:

VICTORIA C NOLEN
NOTARY PUBLIC
STATE OF COLORADO
NOTARY ID # 19984001059
MY COMMISSION EXPIRES JANUARY 18, 2018

(SEAL)

Exhibit 1

Description of the present boundaries of the Roxborough Water & Sanitation District

Exhibit 2

Description (not depiction) of 150 Service Area Property

Appendix F

INTERGOVERNMENTAL AGREEMENT FOR WATER TREATMENT SERVICES BETWEEN ROXBOROUGH WATER AND SANITATION DISTRICT AND THE BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF DOUGLAS

THIS INTERGOVERNMENTAL AGREEMENT FOR WATER TREATMENT SERVICES ("IGA") is made and entered into this 26th day of August, 2014, by and between Roxborough Water and Sanitation District, a quasi-municipal and political subdivision of the State of Colorado ("RWSD"), and the Board of County Commissioners of the County of Douglas, a body politic organized under and existing by virtue of the laws of the State of Colorado (the "County"), collectively, the "Parties."

Definitions

The following terms, when used in this IGA, shall have the meaning set forth below:

150 IGA: That certain proposed intergovernmental agreement for the acquisition of up to 150 acre-feet of water between RWSD, acting by and through its Water Activity Enterprise, and Aurora, acting by and through its Utility Enterprise, to provide RWSD additional water supplies to serve the 150 IGA Area. The 150 IGA is anticipated to be approved and executed no later than October 20, 2014.

150 IGA Area: The existing developments of Plum Valley Heights, Titan Road Industrial Park, Chatfield East, and Chatfield Acres in addition to those areas in the general vicinity of such existing developments, as more particularly depicted on **Exhibit A**, attached hereto and incorporated herein.

Actual Project Cost: The actual and final total cost of completing the Project.

Contract Amount: The amount of the contract for the construction of the Project, as awarded and executed by the RWSD Board. The Contract Amount may be adjusted by the approval of change orders, the costs of which shall be addressed as provided in Paragraph 3.4.1.

County's Estimated Project Cost: The County's share of the Project Cost, which amount is estimated to be $4,820,822.

County's Maximum Project Cost: The maximum amount to be paid by the County for the County's share of the Actual Project Cost, which amount shall not exceed $5,000,000, unless otherwise increased upon the agreement of the Parties.

County Tap Fee: The fee imposed by the County and collected by RWSD at the time the property owner in the Project Area connects his or her property to the Project, as further described in Paragraph 3.6.3 hereof.

Court: The District Court in and for Douglas County, Colorado.

Election: The election to be held on November 4, 2014, at which the eligible electors of Inclusion Area shall vote on the questions of inclusion, as described in Paragraph 4.1 hereof, and the eligible electors of Project Area shall vote on certain ballot issues, as described in Paragraph 4.2 hereof.

Escrow: The escrow account into which the County shall deposit all amounts required by this IGA at the times set forth herein. The escrow will be administered by a third party agent acceptable to the Parties.

Estimated Project Cost: The total estimated cost to complete the Project as contemplated by this IGA, which amount is estimated to be $14,960,316.

Fire Flow: The capacity in a water system necessary to deliver water at a pressure and flow rate adequate for fire suppression.

Inclusion Area: The existing developments of Titan Road Industrial Park, Chatfield East, and Chatfield Acres.

Inclusion Effective Date: The date the order for inclusion of the Inclusion Area into RWSD and the PVH Subdistrict is recorded with the Douglas County Clerk and Recorder as provided in Paragraph 4.4 hereof.

Inclusion Order: An order of the Court to include the Inclusion Area into RWSD and the PVH Subdistrict.

Project: The design, installation and construction of water infrastructure and facilities to connect the Project Area to RWSD's municipal water system, together with the acquisition of raw water supply sufficient for RWSD to provide treated water service to the Project Area. The Project generally includes the acquisition of up to 150 acre-feet of raw water pursuant to the 150 IGA, and a main water distribution line extension, storage facility, internal water distribution lines (not including service lines to individual homes or structures), and all related and necessary appurtenances.

Project Area: The existing developments of Plum Valley Heights, Titan Road Industrial Park, Chatfield East, and Chatfield Acres, as depicted on **Exhibit A**.

Project Cost: Costs associated with the Project as further defined in Paragraph 3.1.

PVH Area: That portion of the Plum Valley Heights subdivision, located in northwestern Douglas County, which was included into the boundaries of RWSD pursuant to the PVH Order for Inclusion.

PVH Board of Directors: The Board of Directors for the PVH Subdistrict.

PVH Order for Inclusion: That certain Order of the District Court in and for Douglas County, Colorado for the inclusion of the PVH Area into the boundaries of RWSD, as recorded in the Douglas County Clerk and Recorder's Office on March 15, 2013 at Reception No. 2013021272.

PVH Subdistrict: The Plum Valley Heights Subdistrict of the Roxborough Water and Sanitation District.

RWSD Board: The Board of Directors for Roxborough Water and Sanitation District.

RWSD's Estimated Project Cost: RWSD's share of the Project Cost, which amount is estimated to be $10,139,494.

Special District Act: Part 1 of Title 32 of the Colorado Revised Statutes.

Water Supply IGA: That certain Intergovernmental Agreement for Water Supply, dated December 20, 2010, entered into between RWSD and the City of Aurora ("Aurora") pursuant to which Aurora agreed to provide a permanent water supply to RWSD, subject to the specific terms, conditions, and limitations contained therein.

1. Recitals

WHEREAS, RWSD is a quasi-municipal corporation and political subdivision of the State of Colorado formed and organized pursuant to the Special District Act; and

WHEREAS, the County is a body corporate and politic of the State of Colorado and subject to Title 30, C.R.S.; and

WHEREAS, pursuant to the Colorado Constitution, Article XIV, Section 18(2)(a) and Section 29-1-203, C.R.S., local governments may cooperate or contract with each other to provide any function, service or facility lawfully authorized to each, and any such contract may provide for the sharing of costs, the imposition of taxes, and the incurring of debt notwithstanding any provision of law limiting the length of the financial contracts or obligations of government; and

WHEREAS, RWSD is authorized, pursuant to its service plan and the Special District Act, to provide treated water services to customers located both within and outside of its boundaries; and

WHEREAS, the County is authorized pursuant to Sections 30-20-402(1)(a) and (b), C.R.S., to construct, improve, and extend water facilities and operate and maintain the same; and

WHEREAS, RWSD and the City of Aurora entered into that certain Water Supply IGA, pursuant to which Aurora agreed to provide a permanent water supply to RWSD, subject to the specific terms, conditions, and limitations contained therein; and

WHEREAS, RWSD and the County have been collectively working on a plan to provide a renewable treated water supply to certain areas located in northwest Douglas County; and

WHEREAS, the County and RWSD have determined that RWSD could provide water service to the Project Area upon satisfaction of certain conditions; and

WHEREAS, RWSD does not have a sufficient water supply to provide treated water service to the Project Area from the water supply provided pursuant to the Water Supply IGA; and

WHEREAS, Aurora and RWSD, with input from the County, have determined that Aurora is able to assist RWSD and the County in providing service to the 150 IGA Area by making additional raw water supplies available to RWSD and the County pursuant to the 150 IGA; and

WHEREAS, the PVH Area was included into the boundaries of RWSD pursuant to the PVH Order for Inclusion; and

WHEREAS, on August 13, 2013, via Resolution No. 13-08-03, as recorded in the Douglas County Clerk and Recorder's Office on August 22, 2013 at Reception No. 2013070670, the RWSD Board approved the formation of the PVH Subdistrict, which includes the PVH Area, for purposes of financing and constructing necessary public improvements to connect the PVH Area to RWSD's municipal water system and to fund ongoing operations and maintenance of those public improvements; and

WHEREAS, the Parties believe that the most effective and efficient means to connect the Project Area to RWSD's municipal water system and for RWSD to provide treated water to the Project Area is to include the existing developments of Chatfield East, Chatfield Acres, and Titan Road Industrial Park into the boundaries of RWSD and the PVH Subdistrict; and

WHEREAS, including the Inclusion Area into the boundaries of RWSD and the PVH Subdistrict will permit the properties within the Project Area to share in the overall costs associated with acquisition of raw water and the installation and construction of the public infrastructure to connect the Project Area to RWSD's municipal water system and for RWSD to supply treated water to the Project Area; and

WHEREAS, RWSD does not currently have sufficient funds to pay for the costs associated with the acquisition of raw water pursuant to the 150 IGA and the construction and installation of infrastructure to connect the Project Area to the RWSD's municipal water system and to provide treated water service to the Project Area; and

WHEREAS, the Parties have engaged in negotiations associated with the financing, construction, operations, and maintenance of the Project, and desire to enter into this IGA to set forth the commitments and responsibilities of the Parties related to the financing, construction, operations, and maintenance of the Project.

NOW THEREFORE, in consideration of the mutual promises and benefits described herein, the receipt, adequacy, and sufficiency of which are hereby acknowledged, RWSD and the County hereby agree as follows:

2. Design and Construction of the Project; 150 IGA

2.1 RWSD will be solely responsible for the design and construction of the Project, subject to the terms and conditions set forth in this IGA. Following the completion of design, RWSD will advertise for public bids or otherwise seek proposals to construct the Project. Commencement of construction of the Project will be contingent upon satisfaction of all conditions set forth in Paragraph 4.3 hereof. The County has determined that the provision of Fire Flow to the Project Area would be cost prohibitive to the inhabitants of the Project Area. Therefore, RWSD and the County acknowledge and agree that the Project will not be designed to provide Fire Flow initially or at any point in the future to the Project Area.

2.2. RWSD shall make good faith efforts to accomplish the 150 IGA by not later than December 31, 2014.

3. Project Cost and Financing

3.1 RWSD and the County hereby agree to share the Project Cost as set forth in this Part 3 of the IGA. The Parties acknowledge and agree that the Estimated Project Cost is $14,960,316 based on the following estimated costs:

Project Engineering and Design Cost:[1]	$1,144,000
Shared Infrastructure Cost:[2]	$4,322,100
Local Infrastructure Cost:[3]	$3,992,361
Water Supply Cost:[4]	$2,473,605
RWSD Water Customer Cost:[5]	$2,698,250
Financing Fees and Debt Reserve Cost:[6]	$ 300,000
Election Cost:[7]	$ 30,000
Estimated Project Cost:	$14,960,316

[1] All costs of engineering and designing the Project including construction oversight, materials, testing and analysis, and all costs related thereto.
[2] All costs associated with the main water distribution line extension and storage facility.
[3] All costs associated with the construction of the local water distribution lines (does not include service line extensions to a home or structure).
[4] All costs associated with the acquisition of raw water to serve 251 residential equivalent units pursuant to the 150 IGA.
[5] Costs recovered through Water Customer Fees, including System Development Charge ($5,900), Permit/Meter Charge ($1,650) and, Inclusion Fee ($3,200). All estimates based on current fees and charges and are subject to change by the RWSD Board.
[6] Cost of application and for loans and related fees for loans contemplated herein and reserve requirements related thereto.
[7] The cost of conducting the Election.

3.2 The Estimated Project Cost, based on estimates described in Paragraph 3.1 above, will be allocated, paid, and subsequently recovered, if at all, by and to RWSD and the County as set forth below in Paragraphs 3.2.1 through 3.2.7.

3.2.1 Project Engineering and Design Cost: All Project Engineering and Design Costs shall be paid by the County. The County hereby agrees to deposit $1,144,000 into the Escrow for payment of such cost on or before January 15, 2015, as further provided in Paragraph 3.3 hereof. RWSD is not responsible for the payment of any portion of the Project Engineering and Design Costs. The County acknowledges that it has no expectation of recovery of any portion of the Project Engineering and Design Costs from revenues generated in the Project Area.

3.2.2 Shared Infrastructure Cost: The Shared Infrastructure Cost shall be the responsibility of RWSD. RWSD expects that the Shared Infrastructure Cost of the Project will be financed through a loan made by the Colorado Water Resources and Power Development Authority to either RWSD or the PVH Subdistrict and that the proceeds from such loan will be received by RWSD or the PVH Subdistrict in May or June 2015.

3.2.3 Local Infrastructure Cost: The Local Infrastructure Cost will be allocated between RWSD and the County as follows:

(i) RWSD shall be responsible for a portion of the Local Infrastructure Cost estimated to be in the amount of $877,900. RWSD or the PVH Subdistrict expect to pay such costs from a portion of the proceeds of the loan described in 3.2.2 hereof.

(ii) The County shall be responsible for a portion of the Local Infrastructure Cost estimated to be in the amount of $3,114,461. The County hereby agrees to deposit its estimated share of the Local Infrastructure Cost into the Escrow on or before January 15, 2015, as further provided in Paragraph 3.3 hereof. The County anticipates the recovery of all or a portion of its share of the Local Infrastructure Cost as described in Paragraph 3.6 hereof.

3.2.4 Water Supply Costs: The Water Supply Costs will be allocated between RWSD and the County as follows:

(i) RWSD shall be responsible for a portion of the Water Supply Costs to serve 251 residential equivalent units estimated to be in the amount of $2,226,244. RWSD expects that the Water Supply Costs of the Project will be financed through a loan made by the Colorado Water Conservation Board to either RWSD or the PVH Subdistrict and that the proceeds from such loan will be received by RWSD or the PVH Subdistrict in the first quarter of 2015. The County shall be responsible for the remaining amount of the Water Supply Costs that is not financed through the loan made by the Colorado Water Conservation Board to either RWSD or the PVH Subdistrict.

(ii) Pursuant to the 150 IGA, up to 150 acre-feet of raw water may be acquired, which would permit service to 316 residential equivalent units. The Parties anticipate approximately 251 residential equivalent units will be located in the Project Area. As a result,

water to service an additional 65 residential equivalent units within the 150 IGA Area may be acquired pursuant to the 150 IGA by separate agreement of the Parties.

3.2.5 Financing Fees and Debt Reserve Cost: All Financing Fees and Debt Reserve Costs of the Project shall be paid by the County. The County shall deposit an amount equal to $300,000 into the Escrow, as further discussed in Paragraph 3.3 hereof, immediately upon mutual execution of this IGA. RWSD is not responsible for the payment of any portion of any Financing Fees and Debt Reserve Costs. The County anticipates the recovery of all or a portion of the Financing Fees and Debt Reserve Cost as described in Paragraph 3.6 hereof.

3.2.6 Election Costs: Costs associated with the Election shall be allocated between RWSD and the County as follows: The County shall be responsible for the first $15,000 in Election Costs and RWSD shall be responsible for all Election Costs in excess of $15,000. In December 2014, RWSD will invoice the County for its portion of Election Costs. The County hereby agrees to remit payment to RWSD within thirty (30) days of receipt of said invoice. The County acknowledges that it has no expectation of recovering any portion of the Election Costs from revenues generated in the Project Area.

3.2.7 RWSD Water Customer Fees: All RWSD Water Customer Fees shall be imposed and collected as provided in RWSD's Rules and Regulations and as described in Paragraph 3.6 hereof.

3.3 As set forth in Paragraph 3.2.5, the County hereby agrees to deposit into the Escrow the amount of $300,000 in order to pay the Finance Fees and Debt Reserve Costs upon mutual execution of this IGA and an amount equal to the County's Estimated Project Cost, less the $300,000 deposited to pay the Finance Fees and Debt Reserve Costs, on or before January 15, 2015, as set forth in Paragraphs 3.2.1, 3.2.3, 3.2.4, and 3.2.5 above. The County shall adjust the amount on deposit in the Escrow based on the contract bids tabulated for the Project, as set forth in Paragraph 3.4 below, provided that any adjustment shall not cause the County's share of the Actual Project Costs to exceed the County's Maximum Project Cost. RWSD shall draw amounts from the Escrow as needed to pay invoices for the Project as such invoices become due. Prior to the withdrawal of any amounts from the Escrow, RWSD shall provide copies of invoices and contractor pay applications to the County for review and a statement with regard to the amount RWSD intends to withdraw from the Escrow. The County may not object to any withdrawals made by RWSD, provided that RWSD has provided copies of all invoices to the County as set forth in this Paragraph 3.3 and such invoices are related to the Project consistent with this IGA.

3.4 The Parties acknowledge and agree that the Project Cost set forth in Paragraph 3.1 hereof is an estimate only and is subject to change. Upon the tabulation of bids for the construction of the Project, RWSD will advise the County of the bid amounts and the County shall adjust the amount of funds escrowed, pursuant to Paragraph 3.3 hereof, as necessary, provided that any adjustment shall not cause the County's Actual Project Cost to exceed the County's Maximum Project Cost. Provided that: (1) all funds necessary to award the construction contract have been provided and obtained as contemplated herein, and (2) RWSD receives an acceptable responsive bidder as determined by the RWSD Board or the PVH Subdistrict Board, then the RWSD Board

or the PVH Subdistrict Board will determine whether to award a construction contract for the Project and will immediately notify the County of such determination.

3.4.1 In the event adjustments are necessary to the Project Cost due to change orders impacting the Contract Amount, RWSD shall notify the County of such adjustments and the Parties will determine if additional funding of the Escrow is necessary by the County, provided that the County's share of the Project Cost shall not cause the County's Actual Project Cost to exceed the County's Maximum Project Cost.

3.4.2 Following determination of the Actual Project Cost and release of final retainage for final payment on the construction contract for the Project, RWSD will provide the County with a summary of total costs and amounts paid by each party, to determine if each party's payments are consistent with the allocations set forth in this IGA. In the event, following review of such summary, the Parties determine that an adjustment or true-up to the amounts paid by each party is required, provided that any adjustment for the County shall not cause the County's Actual Project Cost to exceed the County's Maximum Project Cost. Such review shall be completed within sixty (60) days of RWSD's delivery of the summary of costs and payments to the County. Any funds remaining on deposit in the Escrow upon completion of the Project shall be released to the County.

3.5 RWSD hereby agrees to work with the County in obtaining a grant from the Colorado Water Conservation Board to assist in the payment of the Project Cost. Any funds received from the successful award of a grant will be applied to the County's share of the Project Cost, which shall reduce the County's overall share of the Project Cost. In the event the County and/or RWSD are successful in obtaining other sources of payment of the Project Cost, such funds will be applied to the County's share of the Project Cost first and the remainder, if any, to RWSD's share of the Project Cost.

3.6 A portion of the Project Cost is anticipated to be recovered by the Parties as follows:

3.6.1 RWSD Inclusion Fee. Each property within the Project Area will be obligated to pay $500 of the RWSD Inclusion Fee within sixty (60) days of the Inclusion Effective Date. The balance of the RWSD Inclusion Fee due from each property owner in the Project Area, totaling $2,700 per property, shall be prorated over ten years, including interest, and such pro-rated amounts shall be included in each property's monthly water service bill from RWSD.

3.6.2 RWSD System Development Charge and Permit Fee. The System Development Charge and Permit Fee shall be payable at the time the property owner connects his or her property to the Project, as further described in Paragraph 3.6.6 hereof. The RWSD System Development Charge and Permit Fee shall be payable at the then-current RWSD rates, at the time the property connects to the Project.

3.6.3 County Tap Fee. The County Tap Fee shall be payable at the time the property owner connects his or her property to the Project, as further described in Paragraph 3.6.6 hereof. The County Tap Fee will be established by the County in an amount currently estimated to total

$14,645 per residential equivalent unit. The County Tap Fee is calculated based on an anticipated 251 residential equivalent units within the Project Area. RWSD will collect the County Tap Fee on the County's behalf and remit the proceeds from the County Tap Fee to the County on a quarterly basis, free of any collection or remittance charges.

3.6.4 Monthly Charges. RWSD or the PVH Subdistrict will impose and collect as part of its monthly water bill a surcharge in an amount adequate to collect the balance of the RWSD Inclusion Fee as described in Paragraph 3.6.1 hereof, and in an amount adequate to make principal and interest payments on the loan from the Colorado Water Conservation Board described in Paragraph 3.2.4(i) hereof. The surcharge described herein will be imposed on each property as further described in Paragraph 3.6.6 hereof. The amount of the surcharge will be determined annually by the RWSD Board or PVH Subdistrict Board, as applicable, and is subject to change from year to year. Based on current estimates, the surcharge is initially anticipated to be $65 to $75 per month per residential equivalent unit.

3.6.5 Property Taxes. The PVH Subdistrict will impose a mill levy on each property within the PVH Subdistrict boundary, in an amount adequate to make principal and interest payments on the loan from the Colorado Water Resources and Power Development Authority described in Paragraph 3.2.2 hereof. The amount of the mill levy will be determined annually by the PVH Subdistrict Board and is subject to change from year to year subject to the authority provided by the electors at the Election. Based on current estimates, the mill levy is initially anticipated to be 36 mills. This mill levy will be in addition to any other mill levies imposed by the RWSD Board within the RWSD boundaries. The PVH Subdistrict mill levy will be imposed as further described in Paragraph 3.6.6 hereof.

3.6.6 Timing of Charges and Mill Levy Imposition.

(i) The RWSD System Development Charge and Permit Fee as described in Paragraph 3.6.2 hereof and the County Tap Fee described in Paragraph 3.6.3 hereof, shall be due and payable by each property owner at the time the property owner's property is connected to the Project. All property owners within the Project Area will be required to connect their property to the Project no later than two years following substantial completion of the Project.

(ii) The monthly charges described in Paragraph 3.6.4 hereof shall commence in the month immediately following the Inclusion Effective Date.

(iii) The property taxes described in Paragraph 3.6.5 hereof will be imposed in the year of closing the loan from the Colorado Water Resources and Power Development Authority described in Paragraph 3.2.2 hereof, for collection beginning the immediately following year. By way of example, if the loan closes in May 2015, the mill levy will be imposed by the PVH Subdistrict Board in December 2015 and will be payable by the taxpayers commencing in 2016.

(iv) All fees and charges imposed by RWSD or the PVH Subdistrict shall be immediately secured until paid in full by the statutory lien set forth in Section 32-1-1001(1)(j), C.R.S.

4. Inclusion into RWSD

4.1 As a condition precedent to construction of the Project, the property within the Inclusion Area must be included into the boundaries of RWSD and the PVH Subdistrict. On September 17, 2014, the RWSD Board shall consider the adoption of a resolution to include the Inclusion Area into the boundaries of RWSD and the PVH Subdistrict. If adopted, the RWSD Board will file its resolution and order with the clerk of Court and, as required by § 32-1-401(2)(d), C.R.S., the Court shall direct that the questions of inclusion of the Inclusion Area within the RWSD and PVH Subdistrict be submitted to the eligible electors of the Inclusion Area together with a summary of any conditions, at the Election.

4.2 In addition to the question of inclusion submitted to the eligible electors of the Inclusion Area at the Election as set forth in Paragraph 4.1 above, ballot issues seeking voter authorization for the PVH Subdistrict to increase debt, increase ad valorem property taxes, and to maintain revenues from the imposition of tap fees and other charges on the property within the Project Area, shall be submitted to the eligible electors of the Project Area at the Election. All ballot questions and ballot issues are required to receive a majority of the votes cast at the Election in order for RWSD to complete the inclusion of the Inclusion Area into RWSD and the PVH Subdistrict. If any ballot question or ballot issue is not approved at the Election, the inclusion of the Inclusion Area shall not be consummated, and this IGA shall immediately terminate; provided, however, the County's obligation for its share of the Election Costs, as set forth in Paragraph 3.2.6, hereof shall survive such termination.

4.3 If the majority of the votes cast at the Election are in favor of the inclusion (as set forth in Paragraph 4.1 hereof) and if the majority of the votes cast at the Election are in favor of the ballot issues (as set forth in Paragraph 4.2 hereof), the Court shall enter an order including the Inclusion Area into RWSD and the PVH Subdistrict. Prior to RWSD recording the Inclusion Order, the following must occur: a) execution of the 150 IGA; b) execution of this IGA; c) deposit by the County of the County's Estimated Project Cost into the Escrow (as set forth in Paragraph 3.3 hereof); d) successful closings of the financings described in Paragraphs 3.2.2 and 3.2.4(i) hereof; and e) the award of a construction contract for the Project by the RWSD Board or the PVH Subdistrict Board.

4.4 When all conditions set forth in Section 4.3 are met, RWSD shall record the Inclusion Area order for inclusion in the office of the Douglas County Clerk and Recorder. The Inclusion Area shall be deemed included into RWSD and the PVH Subdistrict upon the date of recording of the Inclusion Order.

5. Water Service

5.1 RWSD agrees to provide treated domestic water service to the Project Area upon completion of the Project, subject to the terms and conditions of the 150 IGA. Following connection to the Project, and in addition to the charges described in Paragraph 3.6 hereof, property owners in the Project Area will be charged for treated water service at RWSD's then existing rates. Treated water service rates and charges are set by the RWSD Board and adjusted by the RWSD Board as it deems necessary.

6. Ownership and Operation of the Project

6.1 The Project will be owned by RWSD and the County on a pro-rata basis determined by the relative amounts of the Project Cost paid for by each party, as set forth in Paragraph 3 hereof. The County shall transfer its pro-rata ownership in the Project to RWSD upon the recovery by the County of costs paid by the County for Local Infrastructure and Financing Fees and Debt Reserve from County Tap Fees. The County may, in its discretion, transfer its pro-rata ownership of the Project, or any portion thereof, to RWSD at any time prior to the recovery by the County of Local Infrastructure Costs and Financing Fees and Debt Reserve Costs from County Tap Fees; provided, however, that the County shall be obligated to transfer all of its pro-rata ownership of the Project to RWSD no later than the fifth anniversary of the effective date of the 150 IGA.

6.2 Operation of the Project and delivery of treated domestic water to the Project Area will be the sole obligation of RWSD.

6.3 In the event future upgrades, major repairs, or replacements to the Project are mandated by any State, Federal or other law, rule or regulation, RWSD shall be responsible for making such upgrade, repair or replacement.

6.3.1 Prior to the County's transfer of its ownership in the Project to RWSD, the costs of any upgrades, major repairs, or replacements to the Project contemplated by Paragraph 6.3 shall be shared between RWSD and the County based on each party's pro-rata share of ownership in the Project. RWSD will provide the County with plans for any future changes or upgrades to the Project. Nothing in this Paragraph 6.3.1 shall obligate the County for any costs associated with routine repairs to the Project or for any costs associated with routine maintenance or operation of the Project.

6.3.2 Prior to the transfer of the County's pro-rata ownership in the Project to RWSD, the Project shall be the sole responsibility of RWSD, including any and all costs associated with the operation, maintenance, routine repair and replacement of the Project, including all infrastructure necessary for RWSD to deliver treated domestic water to the Project Area. Upon the transfer of the County's pro-rata ownership in the Project to RWSD, all aspects of operating, maintaining, repairing, replacing and upgrading the Project shall be the sole obligation of RWSD and each party shall have no obligation to the other pursuant to this IGA.

7. General Provisions

7.1 Term. The term of this IGA shall commence on the date it is mutually executed by the Parties, and shall terminate as set forth in Paragraph 7.18.

7.2 Amendment. Except as otherwise provided herein, this IGA may be modified, amended, changed, or terminated, in whole or in part, only by an agreement in writing duly authorized and executed by both Parties.

7.3 Notice. For purposes of notice pursuant to this IGA, the Parties' representatives shall be:

For RWSD:
Roxborough Water and Sanitation District
Attn: Larry Moore, General Manager
6222 N Roxborough Park Rd
Littleton, CO 80125

With a copy to:
Icenogle Seaver Pogue, P.C.
Attn: Alan Pogue
4725 South Monaco Street, Suite 225
Denver, CO 80237

For the County:
County of Douglas:
Attn: County Manager
Douglas County
100 Third Street
Castle Rock, Colorado 80104

With a copy to:
County of Douglas
Attn: County Attorney
100 Third Street
Castle Rock, Colorado 80104

All notices, demands, requests or other communications required hereunder shall be in writing and shall be given when given personally or sent by registered or certified mail, return receipt requested, postage prepaid. Either party hereto may designate a new address for purposes of notices sent pursuant to this IGA, which may include an electronic mail address, by giving written notice thereof to the other party as provided herein.

7.4 Assignment. This IGA shall not be assignable by either party unless the other party consents in its sole discretion.

7.5 Successors and Assigns. The terms, conditions, and provisions of this IGA shall be binding upon and inure to the benefit of the Parties hereto and their permitted successors and assigns.

7.6 Governing Law. The terms, conditions, and provisions of this IGA shall be governed by and construed in accordance with the laws of the State of Colorado.

7.7 Failure to Perform Due to Force Majeure. Subject to the terms and conditions of this paragraph, no party to this IGA shall be liable for any delay or failure to perform under this IGA due solely to conditions or events of force majeure, as that term is specifically defined herein; provided that (i) the non-performing party gives the other party prompt written notice describing the particulars of the occurrence of the force majeure; (ii) the suspension of performance is of no greater scope and of no longer duration than is required by the force majeure event or condition; and (iii) the non-performing party proceeds with all necessary diligence to remedy its inability to perform and provides weekly progress reports to the other party describing the actions taken to remedy the consequences of the force majeure event or condition. As used herein, force majeure shall mean any delay or failure of a party to perform its obligations under this IGA caused by events beyond the party's reasonable control and without the fault or negligence of the party, including, without limitation, (a) acts of God, (b) sudden actions of the elements such as floods, earthquakes, rock slides, avalanches, or tornadoes, (c) sabotage, (d) vandalism beyond that which can be reasonably prevented by the party, (e) terrorism, (f) war, (g) riots, (h) fire, (i) explosion, (j) severe and unusually cold or hot weather, (k) extreme snow, (l) blockades, (m) insurrection, (n) strike, slowdown or other labor disruptions, (o) changes of law relating to financial obligations, revenues and budgetary matters concerning Colorado local governments and their enterprises, (p) actions by federal, state, municipal, county or other government or agency but only if such requirements, actions or failures to act prevent or delay performance, (q) changes in state or federal law or administrative practice concerning water rights administration, water storage, water quality or stream flow requirements that prevent or delay performance, and (r) inability, despite good faith efforts, to obtain required licenses, permits or approval, which prevents or delays performance.

7.8 Enforcement. This IGA may be enforced in law or equity, by a decree of specific performance, damages, or such other legal and equitable relief as may be available to a party.

7.9 Defense Against Third Parties. In the event of litigation by any third party concerning this IGA, and to the extent permitted by law, the Parties agree to jointly defend any such third party action.

7.10 No Third Party Beneficiaries. Unless otherwise explicitly provided for herein, this IGA shall not grant any status or right to any third party, specifically any owner of any property, to make any claim as a third party beneficiary, or for deprivation of any right, violation of any vesting or rights, or inverse or other condemnation. This IGA is for the benefit of the Parties only to resolve issues between the Parties.

7.11 Entire Agreement. This IGA represents the entire agreement of the Parties and neither party has relied upon any fact or representation not expressly set forth herein.

7.12 Counterparts. This IGA may be executed in any number of counterparts, each of which shall be deemed original, but all of which constitute one and the same agreement.

7.13 Non-severability and Effect of Invalidity. Each provision of this IGA is integral to the others and is not severable from the others. If any portion of this IGA is held invalid or unenforceable for any reason by a court of competent jurisdiction as to either party or as to both Parties, the Parties will immediately attempt to negotiate either valid alternative portions that as near as possible give effect to any stricken portions or a valid replacement agreement.

7.14 No Attorney's Fees and Costs. In the event of any litigation arising out of this IGA, the Parties agree that each will be responsible for its own attorney's fees and costs associated with any such legal action.

7.15 Joint Draft. The Parties agree they drafted this IGA jointly with each having the advice of legal counsel and an equal opportunity to contribute to its content. Therefore, this IGA shall not be construed for or against a party on the basis of authorship.

7.16 Intent of IGA. This IGA is intended to describe the rights and responsibilities of and between the Parties and is not intended to and shall not be deemed to confer rights upon any persons or entities not signatories hereto nor to limit, impair, or enlarge in any way the powers, regulatory authority, and responsibilities of either party or any other governmental entity not a party hereto.

7.17 Non-Business Days. If any date for any action under this IGA falls on a Saturday, Sunday or Holiday, as such term is defined in Rule 6 of the Colorado Rules of Civil Procedure, then the relevant date shall be extended automatically until the next business day.

7.18 Termination. This IGA will terminate in the event: (i) the County fails to deposit the appropriate funds in the Escrow by the deadlines set forth in Paragraph 3.3 hereof; (ii) the Election is unsuccessful as set forth in Paragraph 4.2 hereof; (iii) RWSD provides notice to the County by or before August 30, 2015, that RWSD will be unable to close on the loan from the Colorado Water Resources and Power Development Authority and/or the Colorado Water Conservation Board, as set forth in Paragraphs 3.2.2 and 3.2.4(i) hereof; (iv) 150 IGA is not approved and executed by RWSD and Aurora by December 31, 2014; or (v) upon mutual written agreement of the Parties.

7.19 Appropriation. The obligations of each party to the other, described in this IGA, do not constitute multiple year fiscal obligations of either party. As such, this IGA is not to be considered or construed as a multiple year fiscal obligation of either party and any obligations described in this IGA running from one party to the other are subject to annual appropriation by the applicable party's board. The failure of either party to annually appropriate funds owed to the other as required by this IGA shall result in the immediate termination of this IGA. The amount of funds appropriated for this IGA by the County is $5,000,000. In no event shall the County be liable for payment under this IGA for any amount in excess thereof.

7.20 Recitals. All recitals are incorporated herein.

IN WITNESS WHEREOF, this Intergovernmental Agreement is executed by the Roxborough Water and Sanitation District and the Board of County Commissioners of Douglas County as of the date first above written.

ROXBOROUGH WATER AND SANITATION DISTRICT

David Bane, President

ATTEST:

Tim Moore, Secretary

BOARD OF COUNTY COMMISSIONERS OF THE COUNTY OF DOUGLAS, COLORADO

BY: Roger Partridge, Chair
Board of County Commissioners

ATTEST:

Melissa Pelletier, Deputy Clerk to the Board

APPROVED AS TO FORM:

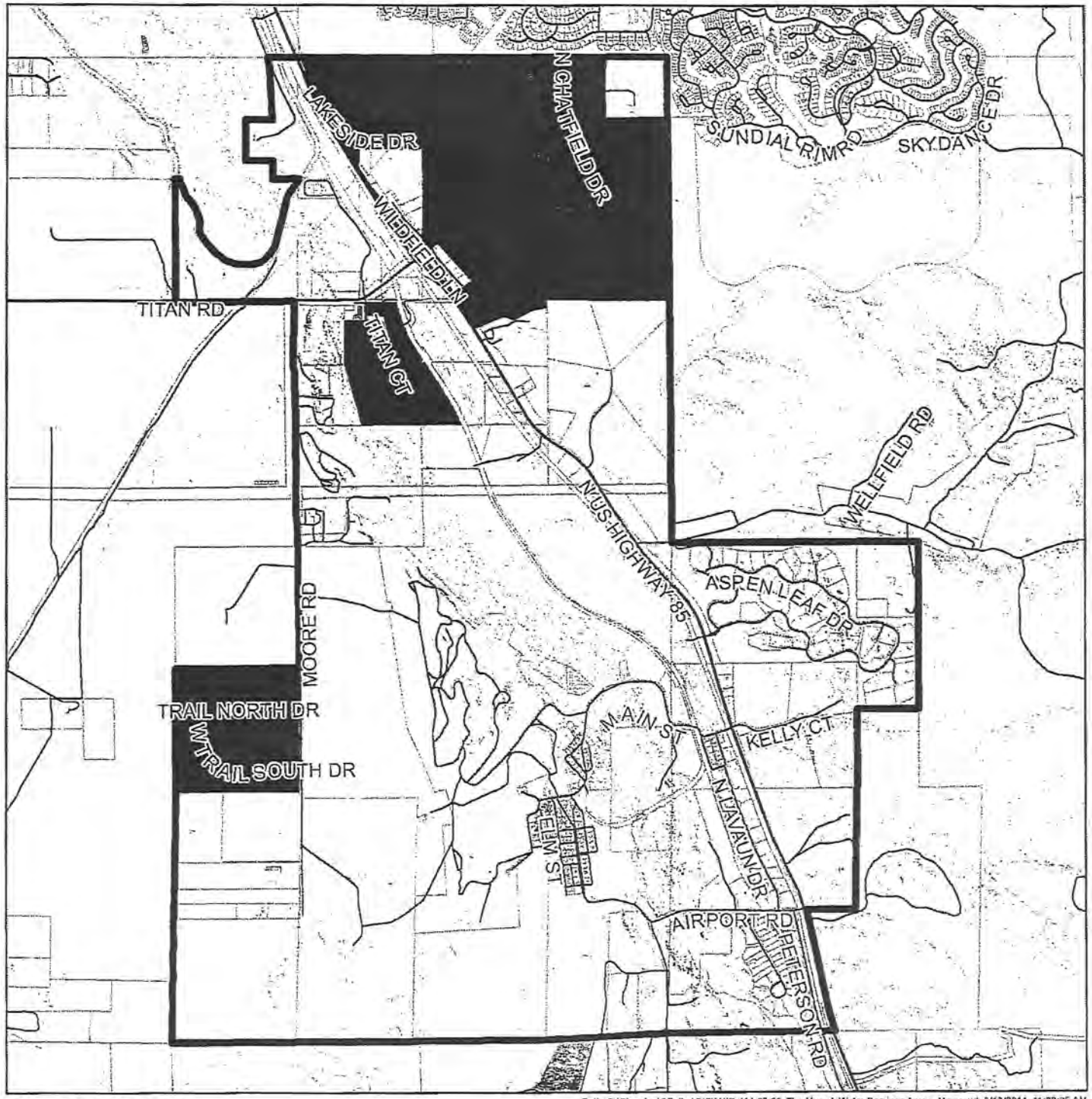
Kristin Decker, Sr. Asst. County Attorney

APPROVED AS TO FISCAL CONTENT:

8/26/14

Andrew Copland, Director of Finance

EXHIBIT A - 150 IGA AREA



Legend

- Project Area
- 150 IGA Area

Roads

- Major Roads
- Other Roads

N

0 1,150 2,300 4,600 6

Feet

August 2014
Douglas County
Department of
Community Development

Path: O:\Planning\CZeiler\GIS\MXDs\14.07.28_Tim Murrel_Water Services Areas_Map.mxd 8/13/2014 11:22:25 AM

DOUGLAS COUNTY