APPENDIX II

WATER STORAGE AND DISTRIBUTION

Section 1 Inventory and Capacities of Existing Water System Facilities

1.1 EXISTING WATER SYSTEM

WELLS

The City currently uses four wells (identified as Wells # 7, 8, 9 and 10) located in Abrams Park.

Wells 7,8 and 9 were constructed in 1986 and can each yield approximately 400 gallons per minute. Presently, each well produces an average of 300 gpm, with the exception of Well #9, which produces 400 gpm. The well water is chlorinated using a sodium hypochlorite injection system located at the pump house. The water quality is excellent and meets all present and anticipated drinking water standards.

In 2007, the City drilled a new Well #10 in Abrams Park. The City has equipped this well for a capacity of 165 gpm.

Wells #1 and #2, both located in Abrams Park, were decommissioned in 2007. One additional well (Well #3 drilled in 1965) is also located within Abrams Park. Well No. 3 is off line and has not been used in many years. Since Wells #1, #2, and #3 are located in Abrams Park, drilling a replacement well would likely be the most efficient option to put water rights to beneficial use for Wells #1, #2, and #3.

The Ridgefield Junction Area was formerly served by a well developed for the Port of Ridgefield Industrial Park. This well has not been used since a water transmission main was extended to the Junction Area in 1996. The well was originally equipped with a 100 gpm pump, but recent pump tests have shown it to have a capacity of 400 gpm. The City is in the process of obtaining water rights for this well. If successful, this well will be equipped with a 400 gpm pump and iron and manganese treatment system.

Water service to most of the existing residences in the rural areas of the Ridgefield UGA is supplied by private wells. As water mains are extended throughout the City, it is expected that most of these residences will connect to the City's water system.

WATER RIGHTS

According to the 2005 Water System Plan, the City currently holds water rights for 962 acre-ft of annual withdrawal and 1,875 gpm of instantaneous withdrawal. These water rights are attached to various current and historical well sources. As the City's water demands increase, rights associated with well sources not currently in use will likely need to be transferred to productive well sources. Additional water rights will also need to be obtained. The City is currently in the process of obtaining 400 gpm and 483 acre-feet of water rights for the Junction Well.

WATER STORAGE FACILITIES

The storage facilities serving the City consist of a low zone 400,000 gallon reservoir located near the cemetery and a 600,000 gallon standpipe reservoir located on Hillhurst Road near Ridgefield High School that serves the upper pressure zone. The upper zone also has a 100,000 gallon reservoir located at the Ridgefield Junction, which, in conjunction with booster pumps, can supplement fire flow to the service area around the Junction Area. A schematic showing the pressure zones and related storage facilities is shown on Figure II.1.

Cemetery Reservoir. The Cemetery Reservoir, serving the lower pressure zone, is a 400,000 gallon, at-grade bolted steel tank which was constructed in 1999. Well #7 in Abrams Park supplies water to the reservoir. Water can also be supplied to the lower pressure zone from the upper pressure zone through pressure reducing valves (PRV's).

High School Reservoir. The High School Reservoir, serves the upper pressure zone. It was constructed in 1986 and has a capacity of approximately 600,000 gallons. Approximately 400,000 gallons are available for fire protection and standby use. The remaining volume cannot be delivered at required system pressures but would still be useful in an emergency. The reservoir is served by Abrams Park Wells #8 and #10, which feed directly into the high pressure zone. The Cemetery Booster Station can also transfer water to the high pressure zone from the Cemetery Reservoir when necessary.

Junction Reservoir. The Junction Reservoir is a 100,000 gallon at grade concrete reservoir located at the Ridgefield Junction on the west side of Interstate-5. The overflow for this reservoir is lower than the hydraulic grade line for the upper pressure zone so water must be pumped from this reservoir to supply the upper pressure zone. The Junction Booster Station is equipped with three 1,000 gpm booster pumps, so it can reliably pump 2,000 gpm from the Junction Reservoir into the upper pressure zone.

Cemetery Hydropneumatic Tank. The City also owns a 3,000 gallon hydropneumatic tank, located adjacent to the Cemetery Booster Station. The tank was originally built with the Cemetery Booster Station to serve the area along the ridge in the southeast part of the City before the High School Reservoir was constructed and the CPU interties were completed. Currently this tank does not serve a significant purpose.

WATER DISTRIBUTION

The City's distribution system consists of approximately 210,600 feet of water main ranging in size from smaller than 3-inches to 16-inches (including steel, PVC, and ductile iron mains). Figure II.2 shows the City's existing water distribution system with color designations for pipe sizes. The 2005 Water System Plan notes several of the 4-inch water lines located downtown need to be replaced to improve fire flow in the downtown area.

1.2 SYSTEM INTERTIES

The City's water system is intertied with Clark Public Utilities (CPU) in three separate locations. The City has an agreement with CPU regarding use of all interties. The first intertie is east of I-5 near the corner of S. 5th Street and S. 85th Avenue. The intertie is owned by CPU and consists of a 10-inch CPU main connected to a 6-inch meter, which is then connected to the City of Ridgefield's water system. The intertie is hydraulically controlled and can provide up to 1,200 gpm as an alternative source of supply during an emergency within Ridgefield's water system. The City and CPU intend for this intertie to transition from emergency to general use over the next several years.

The second intertie the City has with CPU is located at the intersection of NW 279th Street and N. 65th Avenue. It currently serves only the Clark County Fire District No. 12 Fire Station. The third intertie is located at the intersection of NW 289th Street and N. 65th Avenue. This third intertie serves the North Pacific Union Conference Headquarters and Washington State Patrol I-5 Weigh Station. These two interties currently act as satellite systems; however, once a water main is extended up N. 65th Avenue from Pioneer Street, these interties will connect to the City's main distribution system and increase system reliability.

1.3 SCADA SYSTEM

In 2002, the City upgraded their Supervisory Control and Data Acquisition (SCADA) system to include controls over several of the water system components as well as monitoring capabilities. The SCADA operating system is housed at the Wastewater Treatment Plant and is combined with the treatment plant's control program. The SCADA system displays the levels of both the High School Reservoir and the Cemetery Reservoir as well as the status of the pumps in Abrams Park and the booster pump at the Cemetery Reservoir. The system sends alarms when low or high levels occur in either of these reservoirs. The operator may change the on/off settings for the well pumps at Abrams Park as well as the booster pump at the Cemetery Reservoir. The controls presently regulate well production based on storage levels in the Cemetery Reservoir and the High School Reservoir. At this time, the SCADA system does not have control or monitoring capabilities for the booster pumps and the reservoir located at the Junction Area.

1.4 AVAILABLE FIRE FLOW

Previous fire hydrant testing and hydraulic modeling completed as part of the 2005 Water System Plan Update has shown that available fire flows throughout the water system range from approximately 900 gpm to over 3,000 gpm. The areas with less than 1,000 gpm generally occur in the downtown areas that are served by water mains that are 4" in diameter or less. Several projects were identified in the Water System Plan to improve the fire flow in this area. The available fire flow will increase when these undersized water mains are replaced.

1.5 WATER CONSERVATION MEASURES

In order to meet DOH requirements for water conservation, the City has implemented a water conservation program. The measures are based on the DOE-DOH, "Interim Guidelines for Public Water Systems Regarding Water Use Reporting, Demand Forecasting Methodology, and Conservation Programs." This level is appropriate for a system up to 1,000 connections with limited staff resources. The City's conservation measures have been updated with the 2005 Water System Plan. The City has adopted additional water use efficiency goals to comply with the State of Washington's new Water Use Efficiency rules.

The water system encourages water conservation through its rate structure. The commodity charge is among the highest in Clark County and has proven to be a very effective water conservation measure. In addition, new homes are required to install water conserving fixtures such as low flow toilets. Public education has also been utilized to promote water conservation.

Another element of the water conservation program is the accurate measurement of water consumption. Most water service meters are fairly new, less than 15 years old. Accurate water meter information provides an opportunity to compare water production to water consumption and estimate of system losses. Current regulations require utilities to implement a leak detection program if they have more than 10% lost and unaccounted for water. The City is

implementing programs to better document unmetered water use such as hydrant flushing and construction water. The City will also be implementing a leak detection and repair program. Currently, the City's lost and unaccounted for water is below 10%, however for the purpose of this plan, all projections will assume 10% lost and unaccounted for water.

1.6 SERVICE AREA

The City of Ridgefield's current water service area boundary is shown in Figure II.2. This boundary was determined as part to the Clark County Coordinated Water System Planning process. Over time, the City's Urban Growth Area has expanded into areas previously determined to be served by Clark Public Utilities (CPU). The City of Ridgefield has established a policy within its Comprehensive Plan to be the only provider of water service with the Ridgefield Urban Growth Area. The City has initiated discussions with CPU to adjust service area boundaries where appropriate within the City's expanding Urban Growth Area. Where Clark Public Utilities has existing water infrastructure additional discussions will be necessary to determine how to best serve these customers while meeting the City's planning goals.

SECTION 2 FORECAST OF FUTURE WATER SYSTEM NEEDS

2.1 POPULATION AND WATER SYSTEM DEMAND PROJECTIONS

Water system needs will be assessed on the basis of an EDU (Equivalent Dwelling Unit). An EDU is considered to be equal to the amount of water that will be used on an average day by a typical single family residence. To be consistent with the City's 2005 Water System Plan, an EDU will be considered to use 227 gallons per day (gpd). Assuming that lost and unaccounted for water is 10%, the average daily water production required to serve one EDU will be assumed to be 250 gpd. The 2005 Water System Plan showed that the ratio of maximum day usage to average day usage averaged 2.47 from 2002 to 2004. Assuming this peaking factor the maximum day demand for one EDU will be assumed to be 618 gpd. Per the Comprehensive Plan, each EDU is assumed to house 2.53 people.

Water demand projections for the UGA were determined by using the EDU projections developed in Appendix I. These EDU projections include adjustments for several proposed landuse changes from the 2008 CFP. The water demand projections shown in Table II.1 were calculated based upon the following assumptions:

1. Total EDUs equal to 2,416 in 2010 based on the 2008 CFP.
2. Year 2025 UGA population of 26,687
3. Year 2025 UGA retail employment population of 1,771.
4. Year 2025 UGA non-retail employment population of 14,580.
5. Year 2025 projections were adjusted from the 2008 CFP based on changes in projected population and employment identified by the Vacant Buildable Lands Model (VBLM).
6. EDUs between 2010 and 2025 have been assumed to increase at a constant annual rate of 11.53% equal to the average annual increase required to reach 12,420 EDUs in 2025.
7. EDUs after 2025 increase at an annual rate of 4.15% annually to be consistent with the projected growth rate in the Sewer CFP.

Table II.1
Population, Demand, and EDU Projections

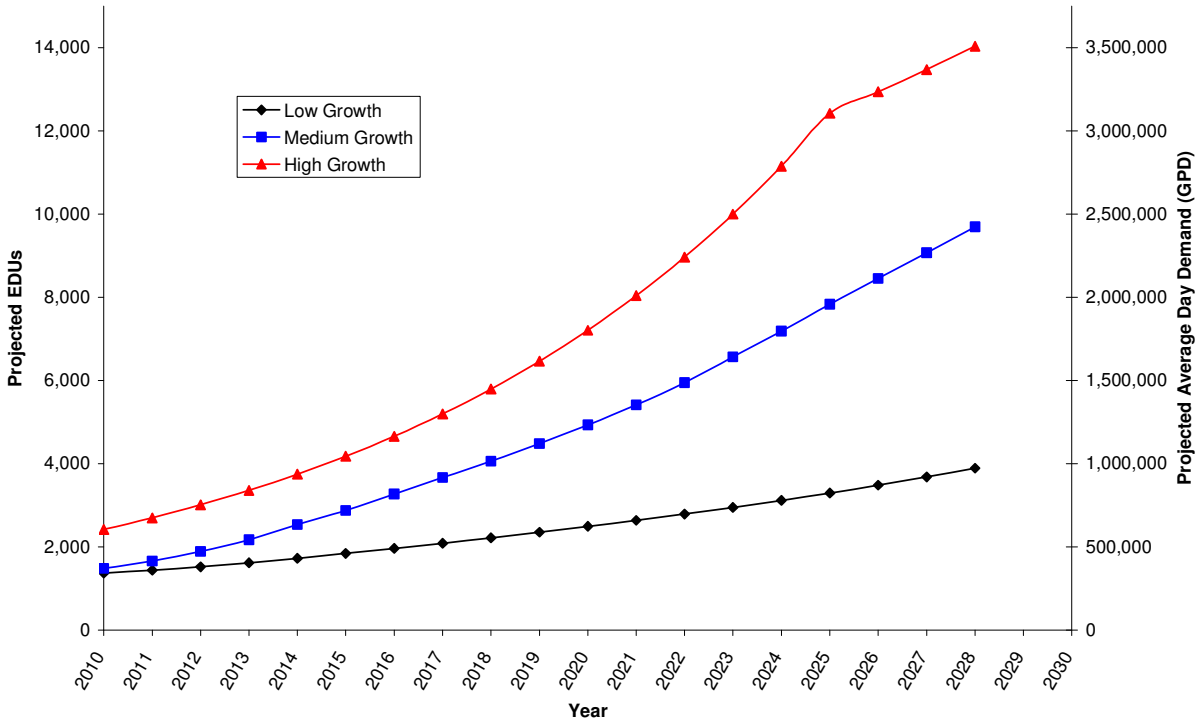
Year	Average Day Demand (gpd) (1)	Maximum Day Demand (gpd) (2)	Total EDUs(3)
2010	604,000	1,492,000	2,416
2011	674,000	1,665,000	2,696
2012	752,000	1,857,000	3,008
2013	839,000	2,072,000	3,356
2014	936,000	2,312,000	3,744
2015	1,044,000	2,579,000	4,176
2016	1,164,000	2,875,000	4,656
2017	1,298,000	3,206,000	5,192
2018	1,448,000	3,577,000	5,792
2019	1,615,000	3,989,000	6,460
2020	1,801,000	4,448,000	7,204
2021	2,009,000	4,962,000	8,036
2022	2,241,000	5,535,000	8,964
2023	2,499,000	6,173,000	9,996
2024	2,787,000	6,884,000	11,148
2025	3,105,000	7,669,000	12,420
2026	3,234,000	7,741,000	12,936
2027	3,368,000	7,813,000	13,472
2028	3,508,000	8,672,000	14,032

(1) Average day demand shown is 250 gpd/ERU from the 2005 Water System Plan;
(2) Maximum day demand is calculated based on the average day demand multiplied by 2.47.
(3) Total EDU's are calculated based on the EDUs computed in the 2008 CFP update adjusted for projected landuse changes.

Table II.1 shows growth under a high growth scenario consistent with projections in regional planning documents. However, this projection was formulated in 2007-2008 when local development was surging. Due to the recent downturn in the economy, this projected growth rate has not materialized and it is not certain whether growth will occur at this rate again in the future. To account for this uncertainty, low and moderate growth scenarios have also been developed.

Figure II.4 shows EDU growth projections under low, medium, and high growth rate scenarios. The high growth rate scenario was used in preparing water demand projections for this Plan. If growth does not proceed at the rate indicated in the high growth rate scenario, capital projects will need to be delayed until the time they are needed based upon system demands.

Figure II.4 Projected EDUs by Growth Scenario



2.2 Comparison of Future Demand and Existing Capacity

The City must evaluate the existing system in order to determine the capital improvements that will be necessary to serve development within the 20-year planning period. Facilities that lack capacity to serve the estimated population must be upgraded in order to provide capacity concurrent with growth. The required capacity is determined using the City's level of service standards, described herein, to estimate future demand. The current capacity is then subtracted from the calculated future capacity, to determine the amount of improvements that will be necessary.

2.3 Level of Service Standards

The minimum level of service (LOS) is set by the standards presented in the Washington State Department of Health's (DOH) "Sizing Guidelines for Public Water Systems". These standards, as applied to Ridgefield's water system, include the following:

1. DOH requires that the minimum production capability of the source and pumping equipment meet the peak (also called maximum) day demand of the system. The City has adopted a slightly more stringent source reliability criteria, requiring the maximum day demand to be supplied while replenishing fire suppression storage within 72 hours. Based on the current fire suppression storage requirement of 240,000 gallons described below, source capacity must be at least 56 gpm greater than the maximum day demand to meet this standard. The City would like to increase this value to 125 gpm, once the Junction Reservoir is constructed and the fire suppression storage criteria is increased to 540,000 gallons.

2. DOH requires that standby storage equal to twice the average day demand connection be provided. This standard may be reduced for systems with multiple sources and a reliable power supply. The allowable reduction is based on the following equation:

SB_{MS} = (2 days) (ADD)(N) - t_m (Q_s - Q_L), where

ADD - Average Day Demand (gpd/EDU) - *250 gpd for Ridgefield per Section 2.1*
N - Number of Service Connections, EDU's
t_m - Time that remaining sources are pumped on the day when largest source is not available, in minutes
Q_s - Sum of all installed, continuously available source of supply capacities, gpm
Q_L - The largest source capacity source available to the system in gpm

DOH recommends that standby volumes be not less than 200 gallons/EDU.

3. Equalization storage is required when the maximum instantaneous demand exceeds the total capacity of the source pumping. Equalizing storage is calculated by the following equation:

ES = (PHD - Qs) * 150 minutes, where

ES - Equalizing Storage
PHD - Peak Hour Demand, in gpm as defined by DOH Water System Design Manual as shown below.
Qs - Sum of all installed and active source of supply capacities

PHD = (MDD/1440)[(C)(N) + F] + 18, where

PHD - Peak Hourly Demand (gallons per minute)
C - Coefficient Associated with Ranges of EDU's, *1.6 for systems > 500 EDU's*
N - Number of Service Connections, EDU's
F - Factor Associated with Ranges of EDU's, *225 for systems > 500 EDU's*
MDD - Maximum Day Demand (gpd/EDU) - *618 gpd for Ridgefield per Section 2.1*

4. Fire storage requirements are based on the fire flow rates and fire durations. For residential areas, the City has adopted a fire flow rate of 1,000 gpm for 120 minutes. The fire flow requirement for non-residential land uses depends on the type of construction, building size, and presence of automatic sprinkler systems. The minimum required fire flow is 1,500 gpm for 120 minutes. The 2005 Water System Plan uses this criteria for commercial and multifamily areas. For industrial areas, the 2005 Water System Plan uses 2,000 gpm for 120 minutes. The City's goal for industrial areas is to have 3,000 gpm available for 180 minutes, however, this goal will not be attainable until additional storage is constructed in the Junction Area.

5. Since standby storage and fire suppression storage serve similar purposes, the Department of Health allows water systems to determine whether these components can be nested (i.e. the components need not be additive) provided that the local fire authority approves of this arrangement. The City of Ridgefield has elected to allow nesting of fire and standby storage components.

6. The City's Engineering Standards provide the minimum standards required for water system design, construction, and materials. The Engineering Standards provide the

regulations that keep the City's utilities functioning effectively for the entire community. For example, dead-end water mains decrease water quality, increase the vulnerability to service interruptions, and reduce fire flow capability. The Engineering Standards encourage good design and construction practices, thus decreasing long-term operation, maintenance, and capital costs.

7. Water system pressures should be maintained in the range of 40 to 80 psi. The system must provide a normal operation pressure of 30 psi at all points in the system during peak hour demands and a minimum of 20 psi at all points in the system during combined fire flow and maximum day demands. This requirement governs the location of storage reservoirs, sizing of booster pumps and distribution mains, and installation of pressure-reducing and pressure-sustaining valves.

2.4 SOURCE CAPACITY NEEDS ASSESSMENT

A. SOURCE CAPACITY

Instantaneous Source Capacity. The City's well system must be able to meet the established production capability LOS standard for the 20-year planning period. The adequacy of the source of supply can be determined by comparing the required supply to the available source of supply needs. The required supply is equal to the projected number of EDUs times the maximum day demand of 618 gpd/EDU. The required supply must also be increased by the flow necessary to support replenishment of fire suppression storage in 72 hours. Through 2015, it was assumed that source capacity would need to be increased by 56 gpm to replenish fire suppression storage. For the purposes of this evaluation, it was assumed that the fire suppression storage would be 540,000 gallons (3,000 gpm for 180 minutes) by 2015 increasing the required supply by 125 gpm. The results are summarized in Table II.2.

Table II.2
INSTANTANEOUS SOURCE CAPACITY EVALUATION

Year	EDUs	Required Supply (gpm)	Available Supply (gpm)[1][2]	Available Water Rights (gpm)[2]	Additional Supply Required (gpm)	Additional Water Rights Required (gpm)
2010	2,416	1,092	1,165	1,875	0	0
2011	2,696	1,212	1,165	1,875	47	0
2012	3,008	1,346	1,165	1,875	181	0
2013	3,356	1,495	1,165	1,875	330	0
2014	3,744	1,662	1,165	1,875	497	0
2015	4,176	1,847	1,165	1,875	682	0
2016	4,656	2,053	1,165	1,875	888	178
2017	5,192	2,282	1,165	1,875	1,117	407
2018	5,792	2,540	1,165	1,875	1,375	665
2019	6,460	2,826	1,165	1,875	1,661	951
2020	7,204	3,145	1,165	1,875	1,980	1,270
2021	8,036	3,502	1,165	1,875	2,337	1,627
2022	8,964	3,900	1,165	1,875	2,735	2,025
2023	9,996	4,342	1,165	1,875	3,177	2,467
2024	11,148	4,836	1,165	1,875	3,671	2,961
2025	12,420	5,382	1,165	1,875	4,217	3,507
2026	12,936	5,432	1,165	1,875	4,267	3,557
2027	13,472	5,482	1,165	1,875	4,317	3,607
2028	14,032	6,078	1,165	1,875	4,913	4,203

(1) Available supply includes 165 gpm from a new Abrams Park Well 10
(2) The available supply and available water rights do not include the Junction Well water right application that is currently being processed.

Table II.2 shows that the City currently has adequate source capacity to serve its existing customers through 2010. By 2028, the City will need an additional 4,913 gpm of source capacity and 4,203 gpm of instantaneous water rights.

Annual Source Capacity. A water system's annual source capacity is based upon its annual water rights. To evaluate the adequacy of the City's annual water rights, the water system's projected annual demands must be compared to its water rights. As discussed in Section 1, the City currently has annual water rights for the withdrawal of 962 acre-ft/yr. To calculate the water system's annual demands the average demand per EDU (250 gpd) is multiplied by the projected number of EDUs. Table II.3 summarizes the results of this analysis.

Table II.3
Annual Source Capacity Evaluation

Year	EDUs	Required Water Rights (acre-ft)	Available Water Rights (acre-ft)	Additional Water Rights Required (acre-ft)
2010	2,416	677	962	0
2011	2,696	755	962	0
2012	3,008	842	962	0
2013	3,356	940	962	0
2014	3,744	1,049	962	87
2015	4,176	1,170	962	208
2016	4,656	1,304	962	342
2017	5,192	1,454	962	492
2018	5,792	1,622	962	660
2019	6,460	1,809	962	847
2020	7,204	2,018	962	1,056
2021	8,036	2,251	962	1,289
2022	8,964	2,510	962	1,548
2023	9,996	2,799	962	1,837
2024	11,148	3,122	962	2,160
2025	12,420	3,478	962	2,516
2026	12,936	3,623	962	2,661
2027	13,472	3,773	962	2,811
2028	14,032	3,930	962	2,968

(1) Available water rights does not include the Junction Well water right application that is currently being processed.

Table II.3 shows that the City currently has adequate annual water rights, but will likely require additional annual water rights before 2015. By 2028, the City will require 2,968 acre-ft of additional water rights.

2.5 STORAGE CAPACITY NEEDS ASSESSMENT

The water system storage capacity must be evaluated by comparing the required amount of storage to the storage available. The required storage consists of the sum of the required operational storage, equalization storage, and the greater of fire storage and standby storage. Required storage volumes have been determined in Table II.4 as follows:

1. The current fire flow requirement is shown as 2,000 for 120 minutes. For 2015 and beyond, the fire flow requirement has been assumed to be 3,000 gpm for 180 minutes.

2. Standby storage is calculated per the DOH requirements with a minimum value of 200 gpd/connection based upon the allowable reduction per DOH requirements.

3. Equalization storage is calculated per the DOH criteria discussed in Section 2.3.

4. Operating storage has been taken as 5% of the total of the other three components (fire flow, standby, and equalization).

5. Available source capacity has been assumed to be the minimum required for the EDUs to be served while providing maximum day demand in 18 hours of pumping.

Table II.4
Storage Needs Projection

	Existing (2010)	2015	2020	2025	2028
EDUs	2,416	4,176	7,204	12,420	14,032
Fire [1]	240,000	540,000	540,000	540,000	540,000
Standby[2]	483,200	835,200	1,440,800	2,484,000	2,806,400
Equalization	91,300	170,300	287,400	489,200	550,800
Operating	40,700	77,300	113,400	175,700	194,900
Total Needed[3]	615,200	1,082,800	1,841,600	3,148,900	3,552,100
Total Available[4]	872,000	872,000	872,000	872,000	872,000
Additional Needed	0	210,800	969,600	2,276,900	2,680,100
Peak Hour Demand (gpm)	1,774	2,982	5,061	8,643	9,750
Assumed Source Capacity (gpm) [5]	1,165	1,847	3,145	5,382	6,078

(1) Assumes that Fire suppression requirements will increase to 3,000 gpm for 3 hours by 2015.
(2) Standby storage is computed as 200 gallons per day/per ERU
(3) Assumes that Fire Storage and Standby Storage can be nested. Therefore the total equals the sum of Fire or Standby, which ever is greater, plus Equalization plus Operating Storage components.
(4) Includes 400,000 gal for the Cemetery Reservoir, 100,000 gal for the Junction Reservoir and 372,000 gallons for High School Reservoir. The remainder of the High School Reservoir storage is dead storage as it cannot be supplied at greater than 20 psi.
(5) Assumes that source capacity is brought on-line as required to meet minimum DOH recommended source capacity to provide maximum day demand in 24-hours of pumping.

Table II.4 shows the City currently has adequate storage capacity. The City will need additional storage capacity shortly after 2010. The 1,000,000 gallon Junction reservoir has been designed to address this deficit. By 2028, the City will need 1,680,100 gallons of storage capacity in addition to that provided by the Junction Reservoir.

2.6 WATER DISTRIBUTION SYSTEM NEEDS ASSESSMENT

Within the UGA, all existing development is currently served by a distribution system that meets minimum requirements. As growth occurs, water mains will need to be extended to serve development. The existing system generally meets the LOS requirements for pressure during normal operating conditions. Some of the older areas of the City cannot meet required minimum pressure while providing the required fire flows due to undersized and dead-end water mains.

The City's 2005 Water System Plan identified the major distribution system improvements necessary to provide a grid for serving future growth. Additional projects will be required to serve the entire UGA.

2.7 IMPROVEMENT ALTERNATIVES

There are numerous alternatives for meeting the deficiencies outlined above. The following paragraphs present the capital improvement program needed to meet future water system needs. It follows the program outlined in the 2005 Water System Plan, with the exception of updated information and cost estimates to meet the expanded UGA.

As an alternative to the City developing its own sources, the City may pursue a wholesale water agreement with Clark Public Utilities. A preliminary evaluation of source alternatives in the 2005 Water System Plan showed that it would be more cost effective for the City to develop its own source if the City can find an adequate quantity and quality of water on its own and obtain the water rights to this water. If the City is unsuccessful in developing its own water resources, the City will pursue a long-term arrangement with CPU.

2.8 CAPITAL IMPROVEMENT PROGRAM

As is shown in the needs assessment, various system improvements will be required as the system grows. Required projects are discussed below. The approximate locations of the various projects are shown in Figure II.3, included in Attachment 1. The actual location of these facilities will be determined based on available land at the time of final design. Detailed cost estimates for source, storage, and distribution projects can be found in Attachment 2.

Source Improvements. As shown previously, the City will need to develop approximately 4,913 gpm of additional source capacity and approximately 2,968 acre-ft of water rights. The City will be performing a hydrogeologic study to determine the most appropriate locations to drill additional wells and evaluate the likelihood of obtaining the quantity and quality of water needed by the City. For the purposes of this analysis, it was assumed that the City would be able to develop 8 additional well sources with a capacity of averaging 615 gpm each. Because of the unknown water quality, it was assumed that each well would require treatment for removal of iron and manganese at a cost of approximately $1.25 per gallon per day of capacity. It was assumed that water rights could be obtained at a cost of $1,000 per acre-ft. If the City is unable to develop additional sources of supply, the City will need to reach an agreement with CPU to provide water to the City.

Storage Improvements. A storage deficiency of approximately 2,680,100 gallons was shown for the 20-year planning period. Since most new development is occurring in the upper pressure zone and water in the upper pressure zone can be supplied to the lower pressure zone, it was assumed that the new reservoirs would all be constructed in the upper pressure zone. To balance out storage in the upper pressure zone, three new storage reservoirs would be constructed. The reservoirs would each have active storage capacities ranging from 800,000 gallons to 1,000,000 gallons. Potential locations of these reservoirs are shown on Figure II.3. Final locations will need to be determined prior to design.

Distribution/Transmission System Improvements. Table II.5 presents the capital improvement plan for the water transmission and distribution system. Pipe sizing was determined based on a hydraulic analysis. All water mains are 12-inches in diameter except D-1 and D-4 through D-7, which are 8-inches in diameter. Costs are in 2010 dollars and include sales tax (8.2%), engineering (25%), and contingency (20%). Figure II.3 provides a map of the existing distribution system and the capital improvements needed to serve the UGA. For each project, a portion of the eligible cost has been allocated to the City and a portion has been allocated to developers. The allocation is based on several factors including the proximity to existing water mains, construction and permitting issues and known and anticipated development patterns. For most water mains, it was assumed that

the cost allocation would be 75% developer/25% City as developers will construct most projects and the City will participate in oversizing of mains to serve larger geographic areas. The actual division of costs will change based on developer needs, parcel subdivisions and other factors that cannot be fully predicted at this time. The City share will be paid through system development charges and system development charge credits.

Table II.5
Distribution and Transmission Improvement Summary

No.	Project Description	Total Estimated Cost	Estimated City Share	Estimated Developer Share
D-1	Mill Street, Railroad Avenue to West	$86,100	$86,100	$0
D-2	Royle Road - High School to Gee Creek	$1,344,000	$336,000	$1,008,000
D-3	45th Ave. - Gee Creek to Pioneer	$778,000	$194,000	$584,000
D-4	8th Street, Pioneer to Shobert	$182,800	$182,800	$0
D-5	4th Street, Pioneer to Sargent	$101,800	$101,800	$0
D-6	Sargent Street, 4th to 5th	$64,600	$64,600	$0
D-7	Mill Street, Main to 5th	$164,000	$164,000	$0
D-9	45th Ave. - Pioneer to N. 10th St.(1)	$261,900	$65,900	$196,000
D-10	NW 279th - 45th Ave. to N. 65th Ave.	$809,400	$202,400	$607,000
D-11	NW 279th Street Boring	$267,500	$267,500	$0
D-12	N. 65th Ave. - Pioneer St to NW 279th	$537,900	$134,900	$403,000
D-13	Future Street, NW 279th to NW 289th	$514,300	$128,300	$386,000
D-14	Bertsinger Road - Pioneer to 45th Ave	$1,871,000	$468,000	$1,403,000
D-15	Future Street, S. 45th Ave. to 11th St.	$566,300	$141,300	$425,000
D-16	I-5 Bridge Crossing(2)	$621,100	$155,100	$466,000
D-17	East Side of I-5 - S. Doland Rd. to S. 10th St.	$413,400	$103,400	$310,000
D-18	Cemetery Booster Station Upgrade	$346,000	$346,000	$0
D-21	NW 51st Ave., Heron Dr. to NW 281st St.	$135,900	$33,900	$102,000
D-23	Future Street., Future Street to NW Carthy Rd.	$1,076,800	$268,800	$808,000
D-25	S. 5th St., NE 10th Ave. to NE 20th Ave.	$615,600	$153,600	$462,000
D-27	Future Rd.; NE 259th to NE 279th	$1,021,000	$255,000	$766,000
D-28	Carty Rd; Hillhurst to I-5	$1,967,900	$491,900	$1,476,000
D-29	Hillhurst, NW 219th, Carty Rd; Loop	$2,092,600	$523,600	$1,569,000
D-30	Future Street to New Reservoir	$481,400	$120,400	$361,000
D-31	Future Street, NW 279th to S 5th St.	$767,400	$191,400	$576,000
Total		**$17,088,700**	**$5,180,700**	**$11,908,000**

(1) The water main from 45th Ave to N. 10th St. has already been partially constructed.
(2) The I-5 bridge crossing was constructed as part of the I-5 bridge replacement.

The capital improvement program summarized in Table II.6 summarizes the capital improvement plan for all water system components. Improvements have been scheduled per five year period; however, this schedule is subject to change based upon the actual pace of development. All costs shown in Table II.6 are shown in 2010 dollars.

Table II.6
Capital Improvement Program

No.	Description	2010[1]	2015	2020	2025
Source					
SO-1	Conduct hydrogeologic study		$25,000		
SO-3	Obtain additional water rights	$1,000,000	$1,000,000	$1,000,000	$1,000,000
SO-5	Complete Fluoridation Study	$5,000			
SO-6	Drill 2 New Wells at Abrams Park	$2,093,000	$2,039,000		
SO-7	Drill 2 New Wells at Junction	$2,229,000		$2,060,000	
SO-8	Drill 2 New Wells near Railroad			$4,289,000	
SO-9	New Interties with CPU				
SO-11	Drill 2 New Wells S 5th St.				$4,289,000
Storage					
St-1	Junction Reservoir Upgrade	$1,824,000			
St-2	New North-West Reservoir		$2,728,000		
St-4	New NE 20th Ave. Reservoir			$2,889,000	
System Control					
SC-1	Telemetry System Upgrade	$45,000			
Distribution					
D-1	Mill Street, Railroad Avenue to West	$86,100			
D-2	Royle Road - High School to Gee Creek	$336,000			
D-3	45th Ave. - Gee Creek to Pioneer	$194,000			
D-4	8th Street, Pioneer to Shobert	$182,800			
D-5	4th Street, Pioneer to Sargent	$101,800			
D-6	Sargent Street, 4th to 5th	$64,600			
D-7	Mill Street, Main to 5th	$164,000			
D-9	45th Ave. - Pioneer to N. 10th St.[2]	$65,900			
D-10	NW 279th - 45th Ave. to N. 65th Ave.			$202,400	
D-11	NW 279th Street Boring			$267,500	
D-12	N. 65th Ave. - Pioneer St to NW 279th		$134,900		
D-13	Future Street, NW 279th to NW 289th		$128,300		
D-14	Bertsinger Road - Pioneer to 45th Ave			$234,000	$234,000
D-15	Future Street, S. 45th Ave. to 11th St.		$141,300		
D-16	I-5 Bridge Crossing[3]				
D-17	East Side of I-5 - S. Doland Rd. to S. 10th St.		$103,400		
D-18	Cemetery Booster Station Upgrade			$346,000	
D-21	NW 51st Ave., Heron Dr. to NW 281st St.		$33,900		
D-23	Future Street., Future Street to NW Carthy Rd.		$268,800		
D-25	S. 5th St., NE 10th Ave. to NE 20th Ave.				$153,600
D-27	Future Rd.; NE 259th to NE 279th				$255,000
D-28	Carty Rd; Hillhurst to I-5			$491,900	

Table II.6
Capital Improvement Program
(cont.)

No.	Description	2010	2015	2020	2025
D-29	Hillhurst, NW 219th, Carty Rd; Loop			$523,600	
D-30	Future Street to New Reservoir			$120,400	
D-31	Future Street, NW 279th to S 5th St.			$191,400	
Total		**$8,391,200**	**$6,602,600**	**$12,615,200**	**$5,931,600**

(1) Projects scheduled for 2010 may be completed at any time between 2010 and 2015.
(2) This project has been partially completed.
(3) The I-5 bridge crossing has already been completed as part of the bridge replacement.

Section 3 Financing Water System Improvements

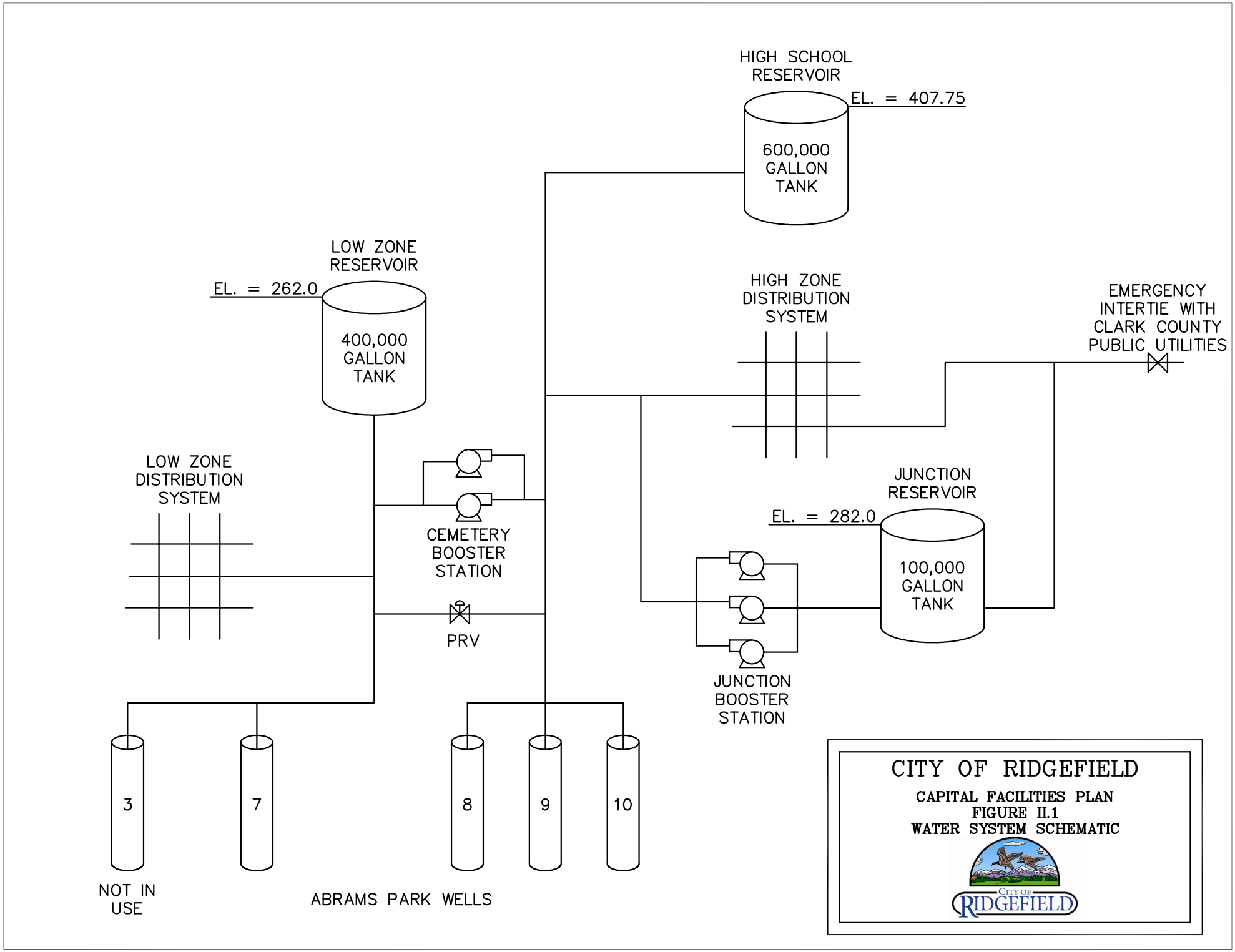
3.1 Recommended Financing Plan

A significant portion of the recommended improvements will primarily benefit new development; therefore, these projects will likely be financed by system development charges (SDCs) and developer funded improvements. An SDC consists of a future facility and an existing facility component. The future facility component covers the cost of capital improvements necessary to serve new customers. The existing facility component reimburses current customers for constructing facilities that will benefit future customers and is calculated based on the original cost of existing facilities divided by the current number of customers. Since the City currently only has an estimated 2,416 EDUs and a substantial amount of existing infrastructure, the existing facility component makes up a significant portion of the total SDC.

In 2005, the City completed an evaluation of its system development charges. Based on this evaluation, the City increased its system development charge to $3,950 to ensure that it adequately reflects the cost of improvements required to serve new development and the value of existing water system assets. Assuming 11,616 new EDUs over the period from 2010 to 2028, the current SDC would generate approximately $45.9 million dollars. The total estimated cost of the capital improvements shown in Tables II.6 is $33.5 million dollars (in 2010 dollars). Therefore it appears that the City will have adequate financial resources to execute this plan. The projected additional SDC revenue generated will be used to cover the cost of inflation during the planning period and will be used to finance replacement of aging existing capital facilities. Even though it appears that SDC revenue will be adequate to fund necessary improvements in the long term, additional sources of funding may be necessary to finance needed improvements. Since water service must exist at the time of development, water facilities must be constructed in advance and it may not be possible to finance them on a "pay-as-you-go" basis. Instead costs may need to be pre-paid through loans that are repaid with connection revenues from new users added over a period of time.

ATTACHMENT 1

FIGURES


HIGH SCHOOL
RESERVOIR
EL. = 407.75
600,000
GALLON
TANK
LOW ZONE
RESERVOIR
EL. = 262.0
400,000
GALLON
TANK
HIGH ZONE
DISTRIBUTION
SYSTEM
EMERGENCY
INTERTIE WITH
CLARK COUNTY
PUBLIC UTILITIES
LOW ZONE
DISTRIBUTION
SYSTEM
CEMETERY
BOOSTER
STATION
JUNCTION
RESERVOIR
EL. = 282.0
100,000
GALLON
TANK
PRV
JUNCTION
BOOSTER
STATION
3
7
8
9
10
NOT IN
USE
ABRAMS PARK WELLS
CITY OF RIDGEFIELD
CAPITAL FACILITIES PLAN
FIGURE II.1
WATER SYSTEM SCHEMATIC
CITY OF
RIDGEFIELD

N

0 2,500 5,000 Feet

LEGEND:

- EXISTING WELL
- EXISTING INTERTIE
- EXISTING RESERVOIR
- CPU WELL
- CPU WATER LINE
- 3-INCH AND LESS
- 4-INCH WATER LINE
- 6-INCH WATER LINE
- 8-INCH WATER LINE
- 10-INCH WATER LINE
- 12-INCH WATER LINE
- 14-INCH WATER LINE
- 16-INCH WATER LINE
- UGA BOUNDARY
- RIVERS AND STREAMS
- EXISTING CITY LIMITS
- EXISTING CPU/RIDGEFIELD WATER SERVICE AREA BOUNDARY
- PARCELS
- WATER

CITY OF RIDGEFIELD

CAPITAL FACILITIES PLAN
FIGURE II.2
EXISTING DISTRIBUTION SYSTEM

CITY OF RIDGEFIELD

cgaskin C:\GIS\DATA\RIDGEFIELD\Project MXDs\07376.00 - CFP Revisions\WATER\CFP Fig. II.2.mxd

N

0 2,500 5,000 Feet

ST-2
SO-8
D-1
D-7
D-5
D-6
D-4
D-18
D-21
SO-2
SO-6
D-10
D-9
D-11
D-10
D-16
D-13
D-12
D-31
D-30
ST-4
SO-11
D-27
D-25
SO-7
ST-1
D-3
D-15
D-14
D-17
D-23
D-28
D-2
D-29

LEGEND:

- EXISTING WELL
- EXISTING INTERTIE
- NEW WELL
- CPU WELL
- EXISTING RESERVOIR
- NEW RESERVOIR
- UGA BOUNDARY
- CPU WATER LINE
- NEW WATER MAINS
- EXISTING WATER LINES
- RIVERS AND STREAMS
- EXISTING CITY LIMITS
- EXISTING CPU/RIDGEFIELD WATER SERVICE AREA BOUNDARY
- PARCELS
- WATER

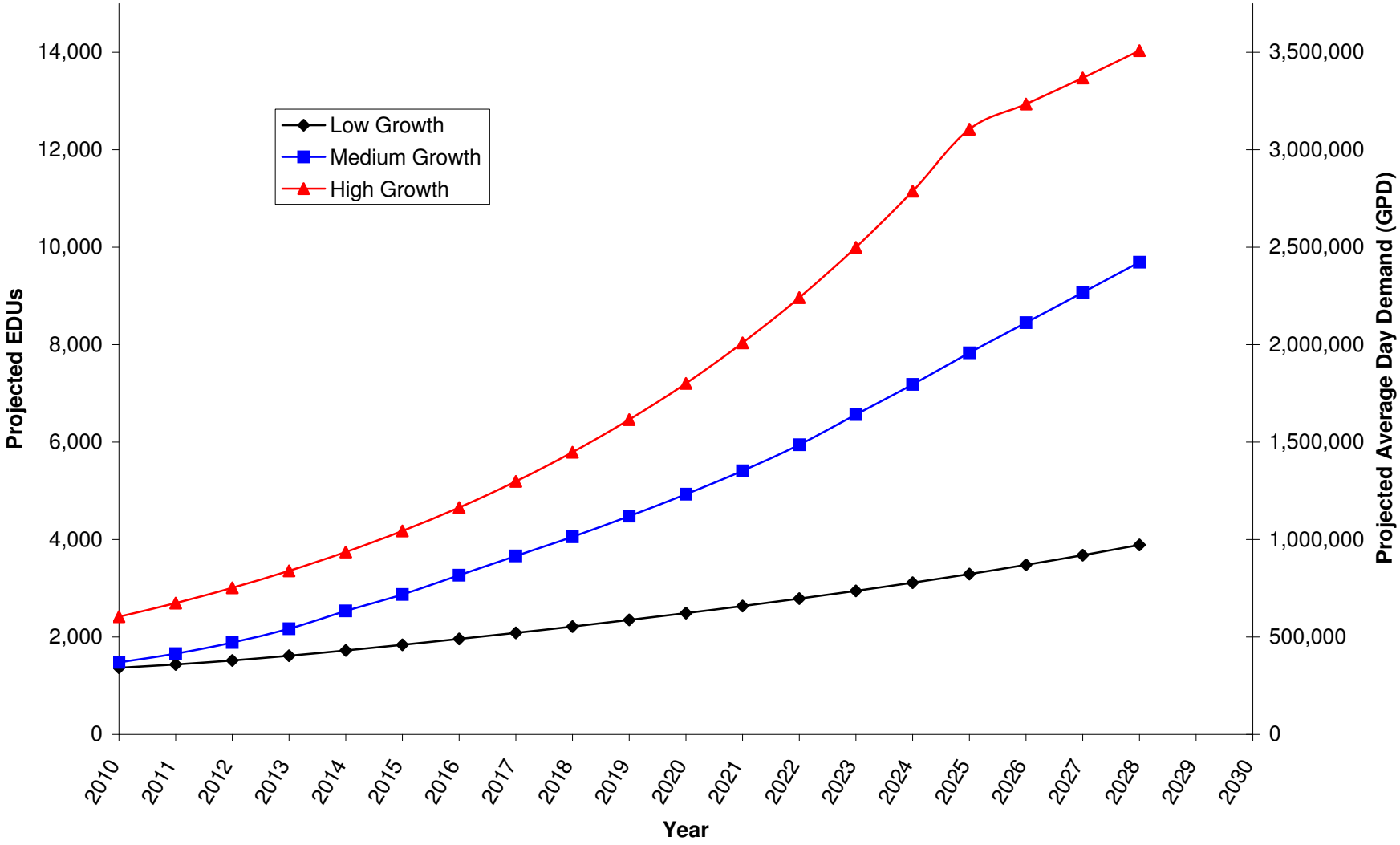
CITY OF RIDGEFIELD

CAPITAL FACILITIES PLAN
FIGURE II.3
WATER SYSTEM IMPROVEMENTS

CITY OF RIDGEFIELD

cgaskin C:\GIS\DATA\RIDGEFIELD\Project MXDs\07376.00 - CFP Revisions\WATER\CFP Fig. II.3.mxd

Figure II.4 Projected EDUs by Growth Scenario



ATTACHMENT 2

DETAILED COST ESTIMATES

City of Ridgefield
Capital Facilities Plan
Capital Improvement Projects

Project Number	Name	Size (in.)	Length (LF)	Total Project Cost	City Funded	Developer Funded	Notes
D-1	Mill Street, Railroad Avenue to West	8	350	$86,100	$86,100	$0	Includes 75 LF of boring under railroad
D-2	Royle Road - High School to Gee Creek	12	5,850	$1,344,000	$336,000	$1,008,000	
D-3	45th Ave. - Gee Creek to Pioneer	12	4,000	$778,000	$194,000	$584,000	
D-4	8th Street, Pioneer to Shobert	8	900	$182,800	$182,800	$0	
D-5	4th Street, Pioneer to Sargent	8	450	$101,800	$101,800	$0	
D-6	Sargent Street, 4th to 5th	8	330	$64,600	$64,600	$0	
D-7	Mill Street, Main to 5th	8	850	$164,000	$164,000	$0	
D-9	45th Ave. - Pioneer to N. 10th St.	12	1,320	$261,900	$65,900	$196,000	
D-10	NW 279th - 45th Ave. to N. 65th Ave.	12	4,150	$809,400	$202,400	$607,000	Not including bridge crossing
D-11	NW 279th Street Boring	12	350	$267,500	$267,500	$0	Boring under I-5 @ 279th
D-12	N. 65th Ave. - Pioneer St to NW 279th	12	2,750	$537,900	$134,900	$403,000	
D-13	Future Street, NW 279th to NW 289th	12	2,625	$514,300	$128,300	$386,000	
D-14	Bertsinger Road - Pioneer to 45th Ave	12	9,630	$1,871,000	$468,000	$1,403,000	
D-15	Future Street, S. 45th Ave. to 11th St.	12	3,525	$566,300	$141,300	$425,000	
D-16	I-5 Bridge Crossing	12	1,700	$621,100	$155,100	$466,000	I-5 crossing on Pioneer St. bridge
D-17	East Side of I-5 - S. Doland Rd. to S. 10th St.	12	2,540	$413,400	$103,400	$310,000	
D-18	Cemetery Booster Station Upgrade	-	-	$346,000	$346,000	$0	
D-21	NW 51st Ave., Heron Dr. to NW 281st St.	12	670	$135,900	$33,900	$102,000	
D-23	Future Street., Future Street to NW Carthy Rd.	12	5,550	$1,076,800	$268,800	$808,000	
D-25	S. 5th St., NE 10th Ave. to NE 20th Ave.	16	2,660	$615,600	$153,600	$462,000	
D-27	Future Rd.; NE 259th to NE 279th	12	5,230	$1,021,000	$255,000	$766,000	
D-28	Carty Rd; Hillhurst to I-5	12	10,150	$1,967,900	$491,900	$1,476,000	
D-29	Hillhurst, NW 219th, Carty Rd; Loop	16	9,150	$2,092,600	$523,600	$1,569,000	
D-30	Future Street to New Reservoir	12	2,430	$481,400	$120,400	$361,000	
D-31	Future Street, NW 279th to S 5th St.	12	3,940	$767,400	$191,400	$576,000	
	Total			**$ 17,088,700**	**$ 5,180,700**	**$ 11,908,000**	

ASSUMPTIONS FOR COST ESTIMATES

Tax rate	8.2	%						
Contingency	20	%						
Engineering and Administrative Costs	25	%						
Mobilization, Cleanup and Demobilization	10%	of subtotal without tax and contingency (round to $1000)						
4-inch DI Water Pipe, Including Fittings	N/A	=UNIT PRICE						
6-inch DI Water Pipe, Including Fittings	$ 40	=UNIT PRICE						
8-inch DI Water Pipe, Including Fittings	$ 44	=UNIT PRICE						
12-inch DI Water Pipe, Including Fittings	$ 50	=UNIT PRICE						
16-inch DI Water Pipe, Including Fittings	$ 58	=UNIT PRICE						
Locate Existing Utilities	2%	of subtotal without mobilization, tax and contingency (round to $1000)						
Erosion Control	2%	of subtotal without mobilization, tax and contingency (round to $1000)						
Additional Pipe Fittings (LBS)	4	-inch	0.08	* Pipe Length=LBS (Round to 50 LBS)				
Additional Pipe Fittings (LBS)	6	-inch	0.12	* Pipe Length=LBS (Round to 50 LBS)				
Additional Pipe Fittings (LBS)	8	-inch	0.45	* Pipe Length=LBS (Round to 50 LBS)				
Additional Pipe Fittings (LBS)	12	-inch	0.50	* Pipe Length=LBS (Round to 50 LBS)				
Additional Pipe Fittings (LBS)	16	-inch	0.60	* Pipe Length=LBS (Round to 50 LBS)				
UNIT PRICE	$ 4.00	PER LB						
Trench Safety Systems	$ 2.00	per LF of Pipe Length						
4-inch Gate Valves	N/A	EA	2	Every	300	feet		
6-inch Gate Valves	$ 900	EA	2	Every	300	feet		
8-inch Gate Valves	$ 1,100	EA	2	Every	300	feet		
12-inch Gate Valves	$ 1,500	EA	2	Every	300	feet		
16-inch Butterfly Valves	$ 2,800	EA	2	Every	600	feet		
18-inch Butterfly Valves	N/A	EA	2	Every	600	feet		
Hydrant Assembly	$ 3,500	EA	Every	400	feet			

TRENCH WIDTH	PIPE SIZE	WIDTH (ft)
	4	2.5
	6	2.5
	8	3.0
	12	3.5
	16	4.0
	18	4.5

LANE WIDTH — WIDTH (ft) 12.0

	MATL DEPTH (feet)	UNT WEIGHT (TN/CY)	EXTRA MATL FACTOR	FRACTION OF LENGTH	PRODUCT
Gravel Backfill	4.00	1.0	1.1	1.00	0.163 * Trench Width = CY/LF
Cost per CY	$ 20.00				
CDF	4.00	1.0	1.1	1.00	0.163 * Trench Width = CY/LF
Cost per CY	$ 85.00				
Foundation Gravel	0.50	1.8	1.1	0.50	0.018 * Trench Width = TN/LF
Cost per TN	$ 25.00				
Asphalt Concrete Pavement Repair	0.25	2.05	1.0	1.00	0.066 * Lane Width = TN/LF
Cost per TN	$ 120.00				
Sawcutting	$ 2.00	= Cost per LF of sawcutting			
Crushed Surfacing, Top Course	0.17	1.8	1.1	1.00	0.012 * Lane Width = TN/LF
Cost per TN	$ 25.00				
Cold Mix Asphalt	0.25	1.800	1.1	0.50	0.009 * Lane Width = TN/LF
Cost per TN	$ 75.00				

Connections to Existing System	$ 1,200	EA						
3/4" Service Connections, complete	$ 750	EA	40	Conn. Per	5,280	feet		
Traffic Control	$ 45	EA	8	HRS per	300	feet		

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-1
Mill Street, Railroad Avenue to West

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 4,800	$ 4,800
2	8-inch DI Water Pipe, Including Fittings	275 LF	$ 44	$ 12,100
3	8-inch DI, inside casing, including boring	75 LF	$ 350	$ 26,250
4	Locate Existing Utilities	LUMP SUM	$ 400	$ 400
5	Erosion Control	LUMP SUM	$ 400	$ 400
6	Additional Pipe Fittings	100 LB	$ 4	$ 400
7	Trench Safety Systems	LUMP SUM	$ 600	$ 600
8	8-inch Gate Valves	2 EA	$ 1,100	$ 2,200
9	Gravel Backfill	130 CY	$ 20	$ 2,600
10	Foundation Gravel	20 TN	$ 25	$ 500
11	Connections to Existing System	2 EA	$ 1,200	$ 2,400
12	Traffic Control	8 HRS	$ 45	$ 360
	Subtotal			$ 53,010
	Tax rate (8.2%)			4,390
	Subtotal:			$ 57,400
	Contingency (20%)			11,500
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 68,900
	Engineering and AdministrativeCosts (25%):			17,200
	TOTAL ESTIMATED PROJECT COST:			**$ 86,100**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-2
Royle Road - High School to Gee Creek

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 75,300	$	75,300
2	12-inch DI Water Pipe, Including Fittings	5,850	LF	$ 50	$	292,500
3	Locate Existing Utilities	LUMP SUM		$ 14,500	$	14,500
4	Erosion Control	LUMP SUM		$ 14,500	$	14,500
5	Additional Pipe Fittings	2,950	LB	$ 4	$	11,800
6	Trench Safety Systems	LUMP SUM		$ 11,700	$	11,700
7	12-inch Gate Valves	39	EA	$ 1,500	$	58,500
8	Gravel Backfill	3,340	CY	$ 20	$	66,800
9	Foundation Gravel	380	TN	$ 25	$	9,500
10	Asphalt Concrete Class B	1,330	TN	$ 120	$	159,600
11	Sawcutting	11,700	LF	$ 2	$	23,400
12	Crushed Surfacing, Top Course	360	TN	$ 25	$	9,000
13	Cold Mix Asphalt	270	TN	$ 75	$	20,250
14	Connections to Existing System	1	EA	$ 1,200	$	1,200
15	Fire Hydrant	15	EA	$ 3,500	$	52,500
16	Traffic Control	156	HRS	$ 45	$	7,020
	Subtotal				$	828,070
	Tax rate (8.2%)					67,930
	Subtotal:				$	896,000
	Contingency (20%)					179,200
	TOTAL ESTIMATED CONSTRUCTION COST:				$	1,075,200
	Engineering and AdministrativeCosts (25%):					268,800
	TOTAL ESTIMATED PROJECT COST:				**$**	**1,344,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-3
45th Ave. - Gee Creek to Pioneer

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 43,600	$ 43,600
2	12-inch DI Water Pipe, Including Fittings	4,000	LF	$ 50	$ 200,000
3	Locate Existing Utilities	LUMP SUM		$ 8,400	$ 8,400
4	Erosion Control	LUMP SUM		$ 8,400	$ 8,400
5	Additional Pipe Fittings	2,000	LB	$ 4	$ 8,000
6	Trench Safety Systems	LUMP SUM		$ 8,000	$ 8,000
7	12-inch Gate Valves	27	EA	$ 1,500	$ 40,500
8	Gravel Backfill	2,280	CY	$ 20	$ 45,600
9	Foundation Gravel	260	TN	$ 25	$ 6,500
10	Asphalt Concrete Class B	270	TN	$ 120	$ 32,400
11	Sawcutting	8,000	LF	$ 2	$ 16,000
12	Crushed Surfacing, Top Course	250	TN	$ 25	$ 6,250
13	Cold Mix Asphalt	180	TN	$ 75	$ 13,500
14	Connections to Existing System	2	EA	$ 1,200	$ 2,400
15	Fire Hydrant	10	EA	$ 3,500	$ 35,000
16	Traffic Control	108	HRS	$ 45	$ 4,860
	Subtotal				$ 479,410
	Tax rate (8.2%)				39,290
	Subtotal:				$ 518,700
	Contingency (20%)				103,700
	TOTAL ESTIMATED CONSTRUCTION COST:				$ 622,400
	Engineering and AdministrativeCosts (25%):				155,600
	TOTAL ESTIMATED PROJECT COST:				**$ 778,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-4
8th Street, Pioneer to Shobert

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 10,200	$	10,200
2	8-inch DI Water Pipe, Including Fittings	900	LF	$ 44	$	39,600
3	Locate Existing Utilities	LUMP SUM		$ 2,000	$	2,000
4	Erosion Control	LUMP SUM		$ 2,000	$	2,000
5	Additional Pipe Fittings	400	LB	$ 4	$	1,600
6	Trench Safety Systems	LUMP SUM		$ 1,800	$	1,800
7	8-inch Gate Valves	6	EA	$ 1,100	$	6,600
8	Gravel Backfill	440	CY	$ 20	$	8,800
9	Foundation Gravel	50	TN	$ 25	$	1,250
10	Asphalt Concrete Class B	60	TN	$ 120	$	7,200
11	Sawcutting	1,800	LF	$ 2	$	3,600
12	Crushed Surfacing, Top Course	60	TN	$ 25	$	1,500
13	Cold Mix Asphalt	40	TN	$ 75	$	3,000
14	Connections to Existing System	3	EA	$ 1,200	$	3,600
15	Service Connections, complete	11	EA	$ 750	$	8,250
16	Fire Hydrant	3	EA	$ 3,500	$	10,500
17	Traffic Control	24	HRS	$ 45	$	1,080
	Subtotal				$	112,580
	Tax rate (8.2%)					9,220
	Subtotal:				$	121,800
	Contingency (20%)					24,400
	TOTAL ESTIMATED CONSTRUCTION COST:				$	146,200
	Engineering and AdministrativeCosts (25%):					36,600
	TOTAL ESTIMATED PROJECT COST:				**$**	**182,800**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-5
4th Street, Pioneer to Sargent

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 5,700	$ 5,700
2	8-inch DI Water Pipe, Including Fittings	450 LF	$ 44	$ 19,800
3	Locate Existing Utilities	LUMP SUM	$ 1,100	$ 1,100
4	Erosion Control	LUMP SUM	$ 1,100	$ 1,100
5	Additional Pipe Fittings	200 LB	$ 4	$ 800
6	Trench Safety Systems	LUMP SUM	$ 900	$ 900
7	8-inch Gate Valves	3 EA	$ 1,100	$ 3,300
8	Gravel Backfill	220 CY	$ 20	$ 4,400
9	Foundation Gravel	20 TN	$ 25	$ 500
10	Asphalt Concrete Class B	30 TN	$ 120	$ 3,600
11	Sawcutting	900 LF	$ 2	$ 1,800
12	Crushed Surfacing, Top Course	30 TN	$ 25	$ 750
13	Cold Mix Asphalt	20 TN	$ 75	$ 1,500
14	Connections to Existing System	2 EA	$ 1,200	$ 2,400
15	Service Connections, complete	10 EA	$ 750	$ 7,500
16	Fire Hydrant	2 EA	$ 3,500	$ 7,000
15	Traffic Control	12 HRS	$ 45	$ 540
	Subtotal			$ 62,690
	Tax rate (8.2%)			5,110
	Subtotal:			$ 67,800
	Contingency (20%)			13,600
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 81,400
	Engineering and AdministrativeCosts (25%):			20,400
	TOTAL ESTIMATED PROJECT COST:			**$ 101,800**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-6
Sargent Street, 4th to 5th

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 3,600	$ 3,600
2	8-inch DI Water Pipe, Including Fittings	330	LF	$ 44	$ 14,520
3	Locate Existing Utilities	LUMP SUM		$ 700	$ 700
4	Erosion Control	LUMP SUM		$ 700	$ 700
5	Additional Pipe Fittings	150	LB	$ 4	$ 600
6	Trench Safety Systems	LUMP SUM		$ 700	$ 700
7	8-inch Gate Valves	3	EA	$ 1,100	$ 3,300
8	Gravel Backfill	160	CY	$ 20	$ 3,200
9	Foundation Gravel	20	TN	$ 25	$ 500
10	Asphalt Concrete Class B	20	TN	$ 120	$ 2,400
11	Sawcutting	660	LF	$ 2	$ 1,320
12	Crushed Surfacing, Top Course	20	TN	$ 25	$ 500
13	Cold Mix Asphalt	20	TN	$ 75	$ 1,500
14	Connections to Existing System	2	EA	$ 1,200	$ 2,400
15	Fire Hydrant	1	EA	$ 3,500	$ 3,500
16	Traffic Control	8	HRS	$ 45	$ 360
	Subtotal				$ 39,800
	Tax rate (8.2%)				3,300
	Subtotal:				$ 43,100
	Contingency (20%)				8,600
	TOTAL ESTIMATED CONSTRUCTION COST:				$ 51,700
	Engineering and AdministrativeCosts (25%):				12,900
	TOTAL ESTIMATED PROJECT COST:				**$ 64,600**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-7
Mill Street, Main to 5th

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 9,200	$ 9,200
2	8-inch DI Water Pipe, Including Fittings	850 LF	$ 44	$ 37,400
3	Locate Existing Utilities	LUMP SUM	$ 1,800	$ 1,800
4	Erosion Control	LUMP SUM	$ 1,800	$ 1,800
5	Additional Pipe Fittings	400 LB	$ 4	$ 1,600
6	Trench Safety Systems	LUMP SUM	$ 1,700	$ 1,700
7	8-inch Gate Valves	6 EA	$ 1,100	$ 6,600
8	Gravel Backfill	420 CY	$ 20	$ 8,400
9	Foundation Gravel	50 TN	$ 25	$ 1,250
10	Asphalt Concrete Class B	60 TN	$ 120	$ 7,200
11	Sawcutting	1,700 LF	$ 2	$ 3,400
12	Crushed Surfacing, Top Course	50 TN	$ 25	$ 1,250
13	Cold Mix Asphalt	40 TN	$ 75	$ 3,000
14	Connections to Existing System	4 EA	$ 1,200	$ 4,800
15	Fire Hydrant	3 EA	$ 3,500	$ 10,500
16	Traffic Control	24 HRS	$ 45	$ 1,080
	Subtotal			$ 100,980
	Tax rate (8.2%)			8,320
	Subtotal:			$ 109,300
	Contingency (20%)			21,900
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 131,200
	Engineering and AdministrativeCosts (25%):			32,800
	TOTAL ESTIMATED PROJECT COST:			**$ 164,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-9
45th Ave. - Pioneer to N. 10th St.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 14,700	$ 14,700
2	12-inch DI Water Pipe, Including Fittings	1,320 LF	$ 50	$ 66,000
3	Locate Existing Utilities	LUMP SUM	$ 2,800	$ 2,800
4	Erosion Control	LUMP SUM	$ 2,800	$ 2,800
5	Additional Pipe Fittings	650 LB	$ 4	$ 2,600
6	Trench Safety Systems	LUMP SUM	$ 2,600	$ 2,600
7	12-inch Gate Valves	9 EA	$ 1,500	$ 13,500
8	Gravel Backfill	750 CY	$ 20	$ 15,000
9	Foundation Gravel	80 TN	$ 25	$ 2,000
10	Asphalt Concrete Class B	90 TN	$ 120	$ 10,800
11	Sawcutting	2,640 LF	$ 2	$ 5,280
12	Crushed Surfacing, Top Course	80 TN	$ 25	$ 2,000
13	Cold Mix Asphalt	60 TN	$ 75	$ 4,500
14	Connections to Existing System	1 EA	$ 1,200	$ 1,200
15	Fire Hydrant	4 EA	$ 3,500	$ 14,000
16	Traffic Control	36 HRS	$ 45	$ 1,620
	Subtotal			$ 161,400
	Tax rate (8.2%)			13,200
	Subtotal:			$ 174,600
	Contingency (20%)			34,900
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 209,500
	Engineering and AdministrativeCosts (25%):			52,400
	TOTAL ESTIMATED PROJECT COST:			**$ 261,900**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-10
NW 279th - 45th Ave. to N. 65th Ave.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 45,300	$ 45,300
2	12-inch DI Water Pipe, Including Fittings	4,150 LF	$ 50	$ 207,500
3	Locate Existing Utilities	LUMP SUM	$ 8,700	$ 8,700
4	Erosion Control	LUMP SUM	$ 8,700	$ 8,700
5	Additional Pipe Fittings	2,100 LB	$ 4	$ 8,400
6	Trench Safety Systems	LUMP SUM	$ 8,300	$ 8,300
7	12-inch Gate Valves	28 EA	$ 1,500	$ 42,000
8	Gravel Backfill	2,370 CY	$ 20	$ 47,400
9	Foundation Gravel	270 TN	$ 25	$ 6,750
10	Asphalt Concrete Class B	280 TN	$ 120	$ 33,600
11	Sawcutting	8,300 LF	$ 2	$ 16,600
12	Crushed Surfacing, Top Course	260 TN	$ 25	$ 6,500
13	Cold Mix Asphalt	190 TN	$ 75	$ 14,250
14	Connections to Existing System	1 EA	$ 1,200	$ 1,200
15	Fire Hydrant	11 EA	$ 3,500	$ 38,500
16	Traffic Control	112 HRS	$ 45	$ 5,040
	Subtotal			$ 498,740
	Tax rate (8.2%)			40,860
	Subtotal:			$ 539,600
	Contingency (20%)			107,900
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 647,500
	Engineering and AdministrativeCosts (25%):			161,900
	TOTAL ESTIMATED PROJECT COST:			**$ 809,400**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-11
NW 279th Street Boring

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 14,500	$	14,500
2	12-inch DI Water Pipe, with Bored and Encasement	350	LF	$ 400	$	140,000
3	Safety Systems	LUMP SUM		$ 1,500	$	1,500
4	Additional Pipe Fittings	200	LB	$ 4	$	800
5	12-inch Gate Valves	2	EA	$ 1,500	$	3,000
6	Connections to Existing System	2	EA	$ 2,500	$	5,000
	Subtotal				$	164,800
	Tax rate (8.2%)					13,500
	Subtotal:				$	178,300
	Contingency (20%)					35,700
	TOTAL ESTIMATED CONSTRUCTION COST:				$	214,000
	Engineering and AdministrativeCosts (25%):					53,500
	TOTAL ESTIMATED PROJECT COST:				**$**	**267,500**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-12
N. 65th Ave. - Pioneer St to NW 279th

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 30,100	$	30,100
2	12-inch DI Water Pipe, Including Fittings	2,750	LF	$ 50	$	137,500
3	Locate Existing Utilities	LUMP SUM		$ 5,800	$	5,800
4	Erosion Control	LUMP SUM		$ 5,800	$	5,800
5	Additional Pipe Fittings	1,400	LB	$ 4	$	5,600
6	Trench Safety Systems	LUMP SUM		$ 5,500	$	5,500
7	12-inch Gate Valves	19	EA	$ 1,500	$	28,500
8	Gravel Backfill	1,570	CY	$ 20	$	31,400
9	Foundation Gravel	180	TN	$ 25	$	4,500
10	Asphalt Concrete Class B	180	TN	$ 120	$	21,600
11	Sawcutting	5,500	LF	$ 2	$	11,000
12	Crushed Surfacing, Top Course	170	TN	$ 25	$	4,250
13	Cold Mix Asphalt	130	TN	$ 75	$	9,750
14	Connections to Existing System	2	EA	$ 1,200	$	2,400
15	Fire Hydrant	7	EA	$ 3,500	$	24,500
16	Traffic Control	72	HRS	$ 45	$	3,240
	Subtotal				$	331,440
	Tax rate (8.2%)					27,160
	Subtotal:				$	358,600
	Contingency (20%)					71,700
	TOTAL ESTIMATED CONSTRUCTION COST:				$	430,300
	Engineering and AdministrativeCosts (25%):					107,600
	TOTAL ESTIMATED PROJECT COST:				**$**	**537,900**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-13
Future Street, NW 279th to NW 289th

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 28,800	$ 28,800
2	12-inch DI Water Pipe, Including Fittings	2,625	LF	$ 50	$ 131,250
3	Locate Existing Utilities	LUMP SUM		$ 5,500	$ 5,500
4	Erosion Control	LUMP SUM		$ 5,500	$ 5,500
5	Additional Pipe Fittings	1,300	LB	$ 4	$ 5,200
6	Trench Safety Systems	LUMP SUM		$ 5,300	$ 5,300
7	12-inch Gate Valves	18	EA	$ 1,500	$ 27,000
8	Gravel Backfill	1,500	CY	$ 20	$ 30,000
9	Foundation Gravel	170	TN	$ 25	$ 4,250
10	Asphalt Concrete Class B	170	TN	$ 120	$ 20,400
11	Sawcutting	5,250	LF	$ 2	$ 10,500
12	Crushed Surfacing, Top Course	160	TN	$ 25	$ 4,000
13	Cold Mix Asphalt	120	TN	$ 75	$ 9,000
14	Connections to Existing System	2	EA	$ 1,200	$ 2,400
15	Fire Hydrant	7	EA	$ 3,500	$ 24,500
16	Traffic Control	72	HRS	$ 45	$ 3,240
	Subtotal				$ 316,840
	Tax rate (8.2%)				25,960
	Subtotal:				$ 342,800
	Contingency (20%)				68,600
	TOTAL ESTIMATED CONSTRUCTION COST:				$ 411,400
	Engineering and AdministrativeCosts (25%):				102,900
	TOTAL ESTIMATED PROJECT COST:				**$ 514,300**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-14
Bertsinger Road - Pioneer to 45th Ave

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$	104,800	$	104,800
2	12-inch DI Water Pipe, Including Fittings	9,630 LF	$	50	$	481,500
3	Locate Existing Utilities	LUMP SUM	$	20,200	$	20,200
4	Erosion Control	LUMP SUM	$	20,200	$	20,200
5	Additional Pipe Fittings	4,800 LB	$	4	$	19,200
6	Trench Safety Systems	LUMP SUM	$	19,300	$	19,300
7	12-inch Gate Valves	65 EA	$	1,500	$	97,500
8	Gravel Backfill	5,490 CY	$	20	$	109,800
9	Foundation Gravel	620 TN	$	25	$	15,500
10	Asphalt Concrete Class B	640 TN	$	120	$	76,800
11	Sawcutting	19,260 LF	$	2	$	38,520
12	Crushed Surfacing, Top Course	600 TN	$	25	$	15,000
13	Cold Mix Asphalt	440 TN	$	75	$	33,000
14	Connections to Existing System	2 EA	$	1,200	$	2,400
15	Fire Hydrant	25 EA	$	3,500	$	87,500
16	Traffic Control	256 HRS	$	45	$	11,520
	Subtotal				$	1,152,740
	Tax rate (8.2%)					94,560
	Subtotal:				$	1,247,300
	Contingency (20%)					249,500
	TOTAL ESTIMATED CONSTRUCTION COST:				$	1,496,800
	Engineering and AdministrativeCosts (25%):					374,200
	TOTAL ESTIMATED PROJECT COST:				**$**	**1,871,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-15
Future Street, S. 45th Ave. to 11th St.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 31,700	$ 31,700
2	12-inch DI Water Pipe, Including Fittings	3,525 LF	$ 50	$ 176,250
3	Locate Existing Utilities	LUMP SUM	$ 6,100	$ 6,100
4	Erosion Control	LUMP SUM	$ 6,100	$ 6,100
5	Additional Pipe Fittings	1,750 LB	$ 4	$ 7,000
6	Trench Safety Systems	LUMP SUM	$ 7,100	$ 7,100
7	12-inch Gate Valves	24 EA	$ 1,500	$ 36,000
8	Gravel Backfill	2,010 CY	$ 20	$ 40,200
9	Foundation Gravel	230 TN	$ 25	$ 5,750
10	Connections to Existing System	1 EA	$ 1,200	$ 1,200
11	Fire Hydrant	9 EA	$ 3,500	$ 31,500
	Subtotal			$ 348,900
	Tax rate (8.2%)			28,600
	Subtotal:			$ 377,500
	Contingency (20%)			75,500
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 453,000
	Engineering and AdministrativeCosts (25%):			113,300
	TOTAL ESTIMATED PROJECT COST:			**$ 566,300**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-16
I-5 Bridge Crossing

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 34,800	$ 34,800
2	12-inch DI Water Pipe, on I-5 Bridge	1,700 LF	$ 200	$ 340,000
3	Safety Systems	LUMP SUM	$ 1,500	$ 1,500
4	Additional Pipe Fittings	850 LB	$ 4	$ 3,400
5	12-inch Gate Valves	2 EA	$ 1,500	$ 3,000
	Subtotal			$ 382,700
	Tax rate (8.2%)			31,400
	Subtotal:			$ 414,100
	Contingency (20%)			82,800
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 496,900
	Engineering and AdministrativeCosts (25%):			124,200
	TOTAL ESTIMATED PROJECT COST:			**$ 621,100**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-17
East Side of I-5 - S. Doland Rd. to S. 10th St.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 23,200	$ 23,200
2	12-inch DI Water Pipe, Including Fittings	2,540 LF	$ 50	$ 127,000
3	Locate Existing Utilities	LUMP SUM	$ 4,500	$ 4,500
4	Erosion Control	LUMP SUM	$ 4,500	$ 4,500
5	Additional Pipe Fittings	1,250 LB	$ 4	$ 5,000
6	Trench Safety Systems	LUMP SUM	$ 5,100	$ 5,100
7	12-inch Gate Valves	17 EA	$ 1,500	$ 25,500
8	Gravel Backfill	1,450 CY	$ 20	$ 29,000
9	Foundation Gravel	160 TN	$ 25	$ 4,000
10	Connections to Existing System	2 EA	$ 1,200	$ 2,400
11	Fire Hydrant	7 EA	$ 3,500	$ 24,500
	Subtotal			$ 254,700
	Tax rate (8.2%)			20,900
	Subtotal:			$ 275,600
	Contingency (20%)			55,100
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 330,700
	Engineering and AdministrativeCosts (25%):			82,700
	TOTAL ESTIMATED PROJECT COST:			**$ 413,400**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-18
Cemetery Booster Station Upgrade

NO.	ITEM	QUANTITY		UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	1	LS	$ 19,000	$ 19,000
2	CMU Building, 12' x 14'	168	SQ FT	$ 300	$ 50,400
3	Site Piping	1	LS	$ 30,000	$ 30,000
4	Booster Pump, installed	2	EA	$ 15,000	$ 30,000
5	Electrical Service, Controls, and Telemetry	1	LS	$ 60,000	$ 60,000
6	Flow Meter	1	EA	$ 4,000	$ 4,000
7	Manual Transfer Switch	1	EA	$ 5,000	$ 5,000
8	Miscellaneous Site Improvements	1	LS	$ 15,000	$ 15,000
	Subtotal				$ 213,400
	Tax rate (8.2%)				17,500
	Subtotal:				$ 230,900
	Contingency (20%)				46,200
	TOTAL ESTIMATED CONSTRUCTION COST:				$ 277,100
	Engineering and AdministrativeCosts (25%):				68,900
	TOTAL ESTIMATED PROJECT COST:				**$ 346,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-21
NW 51st Ave., Heron Dr. to NW 281st St.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 7,600	$ 7,600
2	12-inch DI Water Pipe, Including Fittings	670 LF	$ 50	$ 33,500
3	Locate Existing Utilities	LUMP SUM	$ 1,500	$ 1,500
4	Erosion Control	LUMP SUM	$ 1,500	$ 1,500
5	Additional Pipe Fittings	350 LB	$ 4	$ 1,400
6	Trench Safety Systems	LUMP SUM	$ 1,300	$ 1,300
7	12-inch Gate Valves	5 EA	$ 1,500	$ 7,500
8	Gravel Backfill	380 CY	$ 20	$ 7,600
9	Foundation Gravel	40 TN	$ 25	$ 1,000
10	Asphalt Concrete Class B	40 TN	$ 120	$ 4,800
11	Sawcutting	1,340 LF	$ 2	$ 2,680
12	Crushed Surfacing, Top Course	40 TN	$ 25	$ 1,000
13	Cold Mix Asphalt	30 TN	$ 75	$ 2,250
14	Connections to Existing System	2 EA	$ 1,200	$ 2,400
15	Fire Hydrant	2 EA	$ 3,500	$ 7,000
16	Traffic Control	16 HRS	$ 45	$ 720
	Subtotal			$ 83,750
	Tax rate (8.2%)			6,850
	Subtotal:			$ 90,600
	Contingency (20%)			18,100
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 108,700
	Engineering and AdministrativeCosts (25%):			27,200
	TOTAL ESTIMATED PROJECT COST:			**$ 135,900**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-23
Future Street., Future Street to NW Carthy Rd.

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$	60,300	$	60,300
2	12-inch DI Water Pipe, Including Fittings	5,550 LF	$	50	$	277,500
3	Locate Existing Utilities	LUMP SUM	$	11,600	$	11,600
4	Erosion Control	LUMP SUM	$	11,600	$	11,600
5	Additional Pipe Fittings	2,800 LB	$	4	$	11,200
6	Trench Safety Systems	LUMP SUM	$	11,100	$	11,100
7	12-inch Gate Valves	37 EA	$	1,500	$	55,500
8	Gravel Backfill	3,170 CY	$	20	$	63,400
9	Foundation Gravel	360 TN	$	25	$	9,000
10	Asphalt Concrete Class B	370 TN	$	120	$	44,400
11	Sawcutting	11,100 LF	$	2	$	22,200
12	Crushed Surfacing, Top Course	350 TN	$	25	$	8,750
13	Cold Mix Asphalt	250 TN	$	75	$	18,750
14	Connections to Existing System	2 EA	$	1,200	$	2,400
15	Fire Hydrant	14 EA	$	3,500	$	49,000
16	Traffic Control	148 HRS	$	45	$	6,660
	Subtotal				$	663,360
	Tax rate (8.2%)					54,440
	Subtotal:				$	717,800
	Contingency (20%)					143,600
	TOTAL ESTIMATED CONSTRUCTION COST:				$	861,400
	Engineering and AdministrativeCosts (25%):					215,400
	TOTAL ESTIMATED PROJECT COST:				**$**	**1,076,800**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-25
S. 5th St., NE 10th Ave. to NE 20th Ave.

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM		$ 34,500	$	34,500
2	16-inch DI Water Pipe, Including Fittings	2,660	LF	$ 58	$	154,280
3	Locate Existing Utilities	LUMP SUM		$ 6,600	$	6,600
4	Erosion Control	LUMP SUM		$ 6,600	$	6,600
5	Additional Pipe Fittings	1,600	LB	$ 4	$	6,400
6	Trench Safety Systems	LUMP SUM		$ 5,300	$	5,300
7	16-inch Butterfly Valves	18	EA	$ 2,800	$	50,400
8	Gravel Backfill	1,730	CY	$ 20	$	34,600
9	Foundation Gravel	200	TN	$ 25	$	5,000
10	Asphalt Concrete Class B	180	TN	$ 120	$	21,600
11	Sawcutting	5,320	LF	$ 2	$	10,640
12	Crushed Surfacing, Top Course	170	TN	$ 25	$	4,250
13	Cold Mix Asphalt	120	TN	$ 75	$	9,000
14	Connections to Existing System	2	EA	$ 1,200	$	2,400
15	Fire Hydrant	7	EA	$ 3,500	$	24,500
16	Traffic Control	72	HRS	$ 45	$	3,240
	Subtotal				$	379,310
	Tax rate (8.2%)					31,090
	Subtotal:				$	410,400
	Contingency (20%)					82,100
	TOTAL ESTIMATED CONSTRUCTION COST:				$	492,500
	Engineering and AdministrativeCosts (25%):					123,100
	TOTAL ESTIMATED PROJECT COST:				**$**	**615,600**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-27
Future Rd.; NE 259th to NE 279th

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 57,200	$ 57,200
2	12-inch DI Water Pipe, Including Fittings	5,230 LF	$ 50	$ 261,500
3	Locate Existing Utilities	LUMP SUM	$ 11,000	$ 11,000
4	Erosion Control	LUMP SUM	$ 11,000	$ 11,000
5	Additional Pipe Fittings	2,600 LB	$ 4	$ 10,400
6	Trench Safety Systems	LUMP SUM	$ 10,500	$ 10,500
7	12-inch Gate Valves	35 EA	$ 1,500	$ 52,500
8	Gravel Backfill	2,980 CY	$ 20	$ 59,600
9	Foundation Gravel	340 TN	$ 25	$ 8,500
10	Asphalt Concrete Class B	350 TN	$ 120	$ 42,000
11	Sawcutting	10,460 LF	$ 2	$ 20,920
12	Crushed Surfacing, Top Course	330 TN	$ 25	$ 8,250
13	Cold Mix Asphalt	240 TN	$ 75	$ 18,000
14	Connections to Existing System	2 EA	$ 1,200	$ 2,400
15	Fire Hydrant	14 EA	$ 3,500	$ 49,000
16	Traffic Control	140 HRS	$ 45	$ 6,300
	Subtotal			$ 629,070
	Tax rate (8.2%)			51,630
	Subtotal:			$ 680,700
	Contingency (20%)			136,100
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 816,800
	Engineering and AdministrativeCosts (25%):			204,200
	TOTAL ESTIMATED PROJECT COST:			**$ 1,021,000**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-28
Carty Rd; Hillhurst to I-5

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 110,200	$ 110,200
2	12-inch DI Water Pipe, Including Fittings	10,150 LF	$ 50	$ 507,500
3	Locate Existing Utilities	LUMP SUM	$ 21,200	$ 21,200
4	Erosion Control	LUMP SUM	$ 21,200	$ 21,200
5	Additional Pipe Fittings	5,100 LB	$ 4	$ 20,400
6	Trench Safety Systems	LUMP SUM	$ 20,300	$ 20,300
7	12-inch Gate Valves	68 EA	$ 1,500	$ 102,000
8	Gravel Backfill	5,790 CY	$ 20	$ 115,800
9	Foundation Gravel	650 TN	$ 25	$ 16,250
10	Asphalt Concrete Class B	670 TN	$ 120	$ 80,400
11	Sawcutting	20,300 LF	$ 2	$ 40,600
12	Crushed Surfacing, Top Course	630 TN	$ 25	$ 15,750
13	Cold Mix Asphalt	470 TN	$ 75	$ 35,250
14	Connections to Existing System	2 EA	$ 1,200	$ 2,400
15	Fire Hydrant	26 EA	$ 3,500	$ 91,000
16	Traffic Control	272 HRS	$ 45	$ 12,240
	Subtotal			$ 1,212,490
	Tax rate (8.2%)			99,410
	Subtotal:			$ 1,311,900
	Contingency (20%)			262,400
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 1,574,300
	Engineering and AdministrativeCosts (25%):			393,600
	TOTAL ESTIMATED PROJECT COST:			**$ 1,967,900**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-29
Hillhurst, NW 219th, Carty Rd; Loop

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$	117,200	$	117,200
2	16-inch DI Water Pipe, Including Fittings	9,150 LF	$	58	$	530,700
3	Locate Existing Utilities	LUMP SUM	$	22,500	$	22,500
4	Erosion Control	LUMP SUM	$	22,500	$	22,500
5	Additional Pipe Fittings	5,500 LB	$	4	$	22,000
6	Trench Safety Systems	LUMP SUM	$	18,300	$	18,300
7	16-inch Butterfly Valves	61 EA	$	2,800	$	170,800
8	Gravel Backfill	5,960 CY	$	20	$	119,200
9	Foundation Gravel	670 TN	$	25	$	16,750
10	Asphalt Concrete Class B	610 TN	$	120	$	73,200
11	Sawcutting	18,300 LF	$	2	$	36,600
12	Crushed Surfacing, Top Course	570 TN	$	25	$	14,250
13	Cold Mix Asphalt	420 TN	$	75	$	31,500
14	Connections to Existing System	2 EA	$	1,200	$	2,400
15	Fire Hydrant	23 EA	$	3,500	$	80,500
16	Traffic Control	244 HRS	$	45	$	10,980
	Subtotal				$	1,289,380
	Tax rate (8.2%)					105,720
	Subtotal:				$	1,395,100
	Contingency (20%)					279,000
	TOTAL ESTIMATED CONSTRUCTION COST:				$	1,674,100
	Engineering and AdministrativeCosts (25%):					418,500
	TOTAL ESTIMATED PROJECT COST:				**$**	**2,092,600**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-30
Future Street to New Reservoir

NO.	ITEM	QUANTITY		UNIT PRICE		AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$	27,000	$	27,000
2	12-inch DI Water Pipe, Including Fittings	2,430 LF	$	50	$	121,500
3	Locate Existing Utilities	LUMP SUM	$	5,200	$	5,200
4	Erosion Control	LUMP SUM	$	5,200	$	5,200
5	Additional Pipe Fittings	1,200 LB	$	4	$	4,800
6	Trench Safety Systems	LUMP SUM	$	4,900	$	4,900
7	12-inch Gate Valves	17 EA	$	1,500	$	25,500
8	Gravel Backfill	1,390 CY	$	20	$	27,800
9	Foundation Gravel	160 TN	$	25	$	4,000
10	Asphalt Concrete Class B	160 TN	$	120	$	19,200
11	Sawcutting	4,860 LF	$	2	$	9,720
12	Crushed Surfacing, Top Course	150 TN	$	25	$	3,750
13	Cold Mix Asphalt	110 TN	$	75	$	8,250
14	Connections to Existing System	2 EA	$	1,200	$	2,400
15	Fire Hydrant	7 EA	$	3,500	$	24,500
16	Traffic Control	64 HRS	$	45	$	2,880
	Subtotal				$	296,600
	Tax rate (8.2%)					24,300
	Subtotal:				$	320,900
	Contingency (20%)					64,200
	TOTAL ESTIMATED CONSTRUCTION COST:				$	385,100
	Engineering and AdministrativeCosts (25%):					96,300
	TOTAL ESTIMATED PROJECT COST:				**$**	**481,400**

City of Ridgefield
Preliminary Project Cost Estimate
Distribution System Improvement D-31
Future Street, NW 279th to S 5th St.

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization, Cleanup, and Demobilization	LUMP SUM	$ 43,000	$ 43,000
2	12-inch DI Water Pipe, Including Fittings	3,940 LF	$ 50	$ 197,000
3	Locate Existing Utilities	LUMP SUM	$ 8,300	$ 8,300
4	Erosion Control	LUMP SUM	$ 8,300	$ 8,300
5	Additional Pipe Fittings	1,950 LB	$ 4	$ 7,800
6	Trench Safety Systems	LUMP SUM	$ 7,900	$ 7,900
7	12-inch Gate Valves	27 EA	$ 1,500	$ 40,500
8	Gravel Backfill	2,250 CY	$ 20	$ 45,000
9	Foundation Gravel	250 TN	$ 25	$ 6,250
10	Asphalt Concrete Class B	260 TN	$ 120	$ 31,200
11	Sawcutting	7,880 LF	$ 2	$ 15,760
12	Crushed Surfacing, Top Course	250 TN	$ 25	$ 6,250
13	Cold Mix Asphalt	180 TN	$ 75	$ 13,500
14	Connections to Existing System	2 EA	$ 1,200	$ 2,400
15	Fire Hydrant	10 EA	$ 3,500	$ 35,000
16	Traffic Control	104 HRS	$ 45	$ 4,680
	Subtotal			$ 472,840
	Tax rate (8.2%)			38,760
	Subtotal:			$ 511,600
	Contingency (20%)			102,300
	TOTAL ESTIMATED CONSTRUCTION COST:			$ 613,900
	Engineering and AdministrativeCosts (25%):			153,500
	TOTAL ESTIMATED PROJECT COST:			**$ 767,400**

City of Ridgefield
Capital Facilities Plan
ST-1 - Junction Reservoir
1.0 MG Total Storage - 1.0 MG Active Storage
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	**Mobilization and Demobilization**	1 LS	LUMP SUM	$84,000
2	**Demolition and Disposal**	1 LS	LUMP SUM	$25,000
3	**Reservoir with Appurtenances**	1 LS	LUMP SUM	$500,000
4	**Reservoir Foundation**	1 LS	LUMP SUM	$100,000
5	**Reservoir Painting**	1 LS	LUMP SUM	$150,000
6	**Excavation Safety Systems**	1 LS	LUMP SUM	$20,000
7	**Earthwork (exc., backfill, compaction)**	1 LS	LUMP SUM	$50,000
8	**Piping Valves and Appurtenances**	1 LS	LUMP SUM	$75,000
9	**Sitework (Fencing, Paving, Etc.)**	1 LS	LUMP SUM	$20,000
10	**Electrical and Telemetry**	1 LS	LUMP SUM	$100,000
	Subtotal			$1,124,000
	Washington State Sales Tax (8.2%)			$92,000
	Subtotal			$1,216,000
	Construction Contingency (20%)			$243,000
	Subtotal			$1,459,000
	Engineering and Construction Management (25%)			$365,000
	TOTAL ESTIMATED PROJECT COST			**$1,824,000**

City of Ridgefield
Capital Facilities Plan
ST-2 - Heron Ridge Reservoir
0.75 MG Total Storage - 0.75 MG Active Storage
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	**Mobilization and Demobilization**	1 LS	LUMP SUM	$150,000
2	**Sitework (clear and grub, fencing, etc.)**	1 LS	LUMP SUM	$30,000
3	**Reservoir with Appurtenances**	1 LS	LUMP SUM	$320,000
4	**Reservoir Foundation**	1 LS	LUMP SUM	$70,000
5	**Reservoir Painting**	1 LS	LUMP SUM	$110,000
6	**Excavation Safety Systems**	1 LS	LUMP SUM	$15,000
7	**Earthwork (exc., backfill, compaction)**	1 LS	LUMP SUM	$35,000
8	**Piping Valves and Appurtenances**	1 LS	LUMP SUM	$100,000
9	**Paving and Misc Concrete**	1 LS	LUMP SUM	$50,000
10	**Electrical and Telemetry**	1 LS	LUMP SUM	$150,000
11	**Booster Pump Station**	1 LS	LUMP SUM	$650,000
	Subtotal			$1,680,000
	Washington State Sales Tax (8.2%)			$138,000
	Subtotal			$1,818,000
	Construction Contingency (20%)			$364,000
	Subtotal			$2,182,000
	Engineering and Construction Management (25%)			$546,000
	TOTAL ESTIMATED PROJECT COST			**$2,728,000**

City of Ridgefield
Capital Facilities Plan
ST-4 - NE 20th Ave. Reservoir
0.75 MG Total Storage - 0.75 MG Active Storage
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	**Mobilization and Demobilization**	1 LS	LUMP SUM	$150,000
2	**Land Acquisition**	1 LS	LUMP SUM	$100,000
3	**Sitework (clear and grub, fencing, etc.)**	1 LS	LUMP SUM	$30,000
4	**Reservoir with Appurtenances**	1 LS	LUMP SUM	$320,000
5	**Reservoir Foundation**	1 LS	LUMP SUM	$70,000
6	**Reservoir Painting**	1 LS	LUMP SUM	$110,000
7	**Excavation Safety Systems**	1 LS	LUMP SUM	$15,000
8	**Earthwork (exc., backfill, compaction)**	1 LS	LUMP SUM	$35,000
9	**Piping Valves and Appurtenances**	1 LS	LUMP SUM	$100,000
10	**Paving and Misc Concrete**	1 LS	LUMP SUM	$50,000
11	**Electrical and Telemetry**	1 LS	LUMP SUM	$150,000
12	**Booster Pump Station**	1 LS	LUMP SUM	$650,000
	Subtotal			$1,780,000
	Washington State Sales Tax (8.2%)			$146,000
	Subtotal			$1,926,000
	Construction Contingency (20%)			$385,000
	Subtotal			$2,311,000
	Engineering and Construction Management (25%)			$578,000
	TOTAL ESTIMATED PROJECT COST			**$2,889,000**

Summary

Summary of Source of Supply Improvements
8 new wells needed to supply additional GMA
4 New Well Fields will be used, each with 2 wells

Well Field	Well No.	Capital Cost in 2005 Dollars
Abrams Park	11	$2,093,000
Abrams Park	12	$2,039,000
Abrams Park	**Total**	**$4,132,000**
Junction	1	$2,229,000
Junction	2	$2,060,000
Junction	**Total**	**$4,289,000**
Railroad	3	$2,229,000
Railroad	4	$2,060,000
Railroad	**Total**	**$4,289,000**
S 5th St.	15	$2,229,000
S 5th St.	16	$2,060,000
S 5th St.	**Total**	**$4,289,000**
	Total Capital Cost =	$16,999,000

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-6
New Well No. 11 (Abrams Park)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 21,000	$ 21,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 1,500	$ 1,500
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	160 LF	$ 55	$ 8,800
8	Furnish and Install 10-inch Casing	160 LF	$ 25	$ 4,000
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 40,000	$ 40,000
19	Electrical	1 LS	$ 50,000	$ 50,000
20	Telemetry (SCADA) and Control	1 LS	$ 7,500	$ 7,500
21	Treatment Equipment	1 LS	$ 2,500	$ 2,500
22	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000
	Subtotal			$ 1,289,320
	Washington State Sales Tax (8.2%)			$106,000
	Subtotal			$1,395,320
	Construction Contingency (20%)			$279,000
	Subtotal			$1,674,320
	Engineering and Construction Management (25%)			$419,000
	TOTAL ESTIMATED PROJECT COST			**$2,093,000**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-6
New Well No. 12 (Abrams Park)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 18,000	$ 18,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 1,500	$ 1,500
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	160 LF	$ 55	$ 8,800
8	Furnish and Install 10-inch Casing	160 LF	$ 25	$ 4,000
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 20,000	$ 20,000
19	Electrical	1 LS	$ 40,000	$ 40,000
20	Telemetry (SCADA) and Control	1 LS	$ 7,500	$ 7,500
21	Treatment Equipment	1 LS	$ 2,500	$ 2,500
22	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000
	Subtotal			$ 1,256,320
	Washington State Sales Tax (8.2%)			$103,000
	Subtotal			$1,359,320
	Construction Contingency (20%)			$272,000
	Subtotal			$1,631,320
	Engineering and Construction Management (25%)			$408,000
	TOTAL ESTIMATED PROJECT COST			**$2,039,000**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-7
New Well No. 1 (Junction)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 33,000	$ 33,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 15,000	$ 15,000
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 40,000	$ 40,000
19	Electrical	1 LS	$ 50,000	$ 50,000
20	Power Service	1 LS	$ 5,000	$ 5,000
21	Telemetry (SCADA) and Control	1 LS	$ 15,000	$ 15,000
22	Control Building	1 LS	$ 60,000	$ 60,000
23	Treatment Equipment	1 LS	$ 10,000	$ 10,000
24	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000

Subtotal	$ 1,373,020
Washington State Sales Tax (8.2%)	$113,000
Subtotal	$1,486,020
Construction Contingency (20%)	$297,000
Subtotal	$1,783,020
Engineering and Construction Management (25%)	$446,000
TOTAL ESTIMATED PROJECT COST	**$2,229,000**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-7
New Well No. 2 (Junction)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 19,000	$ 19,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 1,500	$ 1,500
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 20,000	$ 20,000
19	Electrical	1 LS	$ 40,000	$ 40,000
20	Telemetry (SCADA) and Control	1 LS	$ 7,500	$ 7,500
21	Treatment Equipment	1 LS	$ 2,500	$ 2,500
22	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000

Subtotal	$ 1,268,520
Washington State Sales Tax (8.2%)	$104,000
Subtotal	$1,372,520
Construction Contingency (20%)	$275,000
Subtotal	$1,647,520
Engineering and Construction Management (25%)	$412,000
TOTAL ESTIMATED PROJECT COST	**$2,059,500**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-8
New Well No. 3 (Railroad)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 33,000	$ 33,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 15,000	$ 15,000
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 40,000	$ 40,000
19	Electrical	1 LS	$ 50,000	$ 50,000
20	Power Service	1 LS	$ 5,000	$ 5,000
21	Telemetry (SCADA) and Control	1 LS	$ 15,000	$ 15,000
22	Control Building	1 LS	$ 60,000	$ 60,000
23	Treatment Equipment	1 LS	$ 10,000	$ 10,000
24	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000

Subtotal	$ 1,373,020
Washington State Sales Tax (8.2%)	$113,000
Subtotal	$1,486,020
Construction Contingency (20%)	$297,000
Subtotal	$1,783,020
Engineering and Construction Management (25%)	$446,000
TOTAL ESTIMATED PROJECT COST	**$2,229,000**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-8
New Well No. 4 (Railroad)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 19,000	$ 19,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 1,500	$ 1,500
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 20,000	$ 20,000
19	Electrical	1 LS	$ 40,000	$ 40,000
20	Telemetry (SCADA) and Control	1 LS	$ 7,500	$ 7,500
21	Treatment Equipment	1 LS	$ 2,500	$ 2,500
22	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000
	Subtotal			$ 1,268,520
	Washington State Sales Tax (8.2%)			$104,000
	Subtotal			$1,372,520
	Construction Contingency (20%)			$275,000
	Subtotal			$1,647,520
	Engineering and Construction Management (25%)			$412,000
	TOTAL ESTIMATED PROJECT COST			**$2,059,500**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-11
New Well No. 15 (S. 5th St.)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 33,000	$ 33,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 15,000	$ 15,000
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 40,000	$ 40,000
19	Electrical	1 LS	$ 50,000	$ 50,000
20	Power Service	1 LS	$ 5,000	$ 5,000
21	Telemetry (SCADA) and Control	1 LS	$ 15,000	$ 15,000
22	Control Building	1 LS	$ 60,000	$ 60,000
23	Treatment Equipment	1 LS	$ 10,000	$ 10,000
24	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000

Subtotal	$ 1,373,020
Washington State Sales Tax (8.2%)	$113,000
Subtotal	$1,486,020
Construction Contingency (20%)	$297,000
Subtotal	$1,783,020
Engineering and Construction Management (25%)	$446,000
TOTAL ESTIMATED PROJECT COST	**$2,229,000**

City of Ridgefield
Capital Facilities Plan
Source Improvement SO-11
New Well No. 16 (S. 5th St.)
Engineer's Estimate

NO.	ITEM	QUANTITY	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	1 LS	$ 19,000	$ 19,000
2	Trench Excavation Safety Systems	1 LS	$ 1,000	$ 1,000
3	Site Work	1 LS	$ 1,500	$ 1,500
4	Erosion Control	1 LS	$ 1,000	$ 1,000
5	Install Surface Seal	30 LF	$ 100	$ 3,000
6	10-Inch Drive Shoe	1 EA	$ 1,500	$ 1,500
7	Drill Hole for 10-inch Casing	300 LF	$ 55	$ 16,500
8	Furnish and Install 10-inch Casing	300 LF	$ 25	$ 7,500
9	10-Inch Shoe Cut	1 LS	$ 1,500	$ 1,500
10	Furnish and Install Screen Assembly and Other	1 LS	$ 10,000	$ 10,000
11	Authorized Hourly Work	75 HR	$ 160	$ 12,000
12	Furnish and Install Pump Test Equipment	1 LS	$ 2,000	$ 2,000
13	Pump Test	72 HR	$ 160	$ 11,520
14	Test Water Conveyance System	1 LS	$ 2,500	$ 2,500
15	Standby Time	10 HR	$ 100	$ 1,000
16	Well Building	1 LS	$ 15,000	$ 15,000
17	Well Assembly	1 LS	$ 30,000	$ 30,000
18	Site Piping, Valves, and Appurtenances	1 LS	$ 20,000	$ 20,000
19	Electrical	1 LS	$ 40,000	$ 40,000
20	Telemetry (SCADA) and Control	1 LS	$ 7,500	$ 7,500
21	Treatment Equipment	1 LS	$ 2,500	$ 2,500
22	Iron and Manganeese Removal Equipment	1 LS	$ 1,062,000	$ 1,062,000
	Subtotal			$ 1,268,520
	Washington State Sales Tax (8.2%)			$104,000
	Subtotal			$1,372,520
	Construction Contingency (20%)			$275,000
	Subtotal			$1,647,520
	Engineering and Construction Management (25%)			$412,000
	TOTAL ESTIMATED PROJECT COST			**$2,059,500**