3.18 Utilities

This section describes the relationship of the City Heights conceptual land use alternatives to the provision of City water and sewer services; on-site utilities that may or may not connect to City systems (depending on the alternative selected for implementation); stormwater management in compliance with State and local requirements; and franchise utilities for the provision of electrical service, natural gas, telecommunications, and solid waste collection and disposal. The description of water, sewer, and stormwater systems is summarized from the *Grading, Drainage and Utilities Technical Engineering Report* prepared for the project (Encompass Engineering & Surveying 2010). The description of franchise utilities is derived from personal communications with the respective utility representatives cited in the text and References section (Draft EIS Chapter 4).

3.18.1 Water Service

AFFECTED ENVIRONMENT

The City of Cle Elum and Town of South Cle Elum have an integrated water system. While each community owns various system components, the components are integrated into and operate as one water system. This system also serves the Suncadia Master Planned Resort (MPR) that lies outside the City limits to the west.

There are several agreements between Cle Elum, South Cle Elum, and/or Trendwest (Suncadia) that affect management of the water system and the allocation of water and costs. Among these are the Water Supply System Project Development Agreement, the Agreement Relating to Water Delivery to Mountainstar Resort, the Agreement relating to Water Supply for Bullfrog Flats Urban Growth Area (UGA) − all dated June 19, 2001 (the "Water Agreements"). The Mountainstar Resort referenced above is now known as the Suncadia Resort.

Subsections below describe the existing City of Cle Elum water system infrastructure, including surface water supply sources and wells, storage facilities, and distribution pipelines as reported in the 2006 *City of Cle Elum and Town of South Cle Elum Comprehensive Water Plan* (2006 Water Plan). Diagrams of existing water system facilities and of the Critical Water Supply Service Area Boundary are provided as Figures 4.1 and 4.2 in the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010).

Existing Water Supply Sources

The City's water system has three sources, two of which are water rights owned by the City of Cle Elum, and one owned by the Town of South Cle Elum. The City of Cle Elum has a considerable reserve quantity of water available to serve future development that is not currently being used by existing customers or targeted for specific projected growth.

Yakima River Water Supply System (owned by the City of Cle Elum). In 2004, a replacement intake structure was constructed in the south bank of the Yakima River, east of the South Cle Elum bridge. Two intake pipes in the intake structure convey water to a pumping station on top of the south bank dike in which there are three pumps with a capacity of 1,400 gallons per minute each. The system is designed to operate two pumps at a time with the third pump on standby. Raw water is conveyed across the Yakima River in two 18-inch diameter ductile iron pipes in a utility trench box constructed across the river

bottom, on the downstream side of the South Cle Elum bridge. A 12-inch diameter pipe in the utility trench box conveys treated water back across the river to the Town of South Cle Elum.

Additional pumps are not scheduled to be added to the Yakima River source at this time. The third pump can be utilized at the Yakima River source during times of high demand. There may also be the potential to increase the pumping capacity by increasing the size of the pumps at the Yakima River intake.

Cle Elum River Water Supply System (owned by the City of Cle Elum). The Cle Elum River Water Supply System is not being used as a primary water supply system on a regular basis at the time of this writing. It is intended to be used as a back-up system to the City's Yakima River Water Supply System. In the event that Yakima River water would reach unacceptable levels of certain water quality parameters (such as suspended sediments) to be used for drinking water, the Cle Elum Water Supply System would be utilized until such time as the Yakima River water returns to acceptable drinking water quality levels.

A former sidebank diversion further upstream on the Cle Elum River was converted in 2006 to a system of eight shallow (40 feet deep) groundwater wells between the old and new Bullfrog Road bridges. Each well is served by a 40 horse-power pump system with transducers. A 12-inch ductile iron pipe, which changes to polyvinyl chloride pipe after the first 450 feet, supplies the water from the well field to the City's water treatment plant adjacent to SR 903, east of the Cle Elum-Roslyn Schools complex. Even though it was assumed in the 2006 Water Plan that each of these wells would have the capacity to pump 350 gallons per minute, the actual capacities vary from well to well. Based on a conversation with City staff, the pumps can be set to supply the desired 1,400 gallons per minute to the water treatment plant. This system was completed in 2009.

Well No. 1 and Well No. 7 (owned by the Town of South Cle Elum). Well No. 1 and Well No. 7 are located in the Town of South Cle Elum Town Park, and operate as a well field. Well No. 1 produces 250 gallons per minute in the summer and 40 gallons per minute in the winter. Well No. 7 produces 150 gallons per minute in the summer and 30 gallons per minute in the winter. Both wells share a disinfection facility prior to entering the local distribution system. South Cle Elum well water is used in South Cle Elum, within their original distribution system, as a means to augment service to its customers. It is also integrated with the joint City of Cle Elum/Town of South Cle Elum water supply and distribution system.

Water Treatment

The City of Cle Elum Yakima River and Cle Elum River sources are pumped to the City's water treatment plant adjacent to SR 903, east of the Cle Elum-Roslyn Schools complex for filtration and chlorination prior to entering the distribution system. The water treatment plant, constructed in 2004, has an existing capacity of 4.0 million gallons per day (mgd) with the capacity to accommodate two additional treatment trains and booster pumps to increase the capacity to 8.0 mgd. In accordance with the 2006 Water Plan, the City of Cle Elum is scheduled to increase the treatment facility capacity to 6.0 mgd in 2016, and to 8.0 mgd in 2026. Existing agreements between the City of Cle Elum and Suncadia require the City to increase the treatment capacity at certain trigger points. A trigger point occurs when either water production exceeds 2.0 mgd for three or more days within a 12-month period, or when Suncadia has added 1,334 new residential (or equivalent residential unit [ERU]) water connections.

Water from the South Cle Elum wells is treated independently and does not enter the City of Cle Elum water treatment facility; however, it is added to the Cle Elum water system distribution system.

Water Storage

The City of Cle Elum/South Cle Elum integrated water system has five reservoirs serving three pressure zones. Pressure zones correlate relative elevation to sea level. Pressure Zone 1 serves customers located between elevations 1,865 and 1,965 feet above mean sea level (msl). There are two existing tanks within this pressure zone with capacity of 100,000 gallons and 200,000 gallons. In addition, a 500,000-gallon storage facility is located between Zone 1 and Zone 2 that serves Zone 1. Therefore, the total storage capacity in Pressure Zone 1 is 800,000 gallons. Pressure Zone 2 serves customers located between elevations 1,965 and 2,080 above msl. There is one existing storage facility serving this pressure zone with a storage capacity of 500,000 gallons. Pressure Zone 3 serves customers located between elevations 2,080 and 2,200 above msl. There is one existing storage facility serving this pressure zone with a storage capacity of 1,400,000 gallons.

Water Distribution System

The City of Cle Elum water distribution lines (those with service connections to water users) consist of pipes ranging in size from 2-inch to 16 inches in diameter, with the majority of the pipe diameters being 4-inch, 6-inch, 8-inch and 12 inches in size. The City's transmission lines (those that do not have service lines connected directly to them) consist of pipe diameters ranging in size from 12-inch to 20 inches in diameter. The distribution and transmission lines total approximately 26 miles of pipe.

Water Service Area

Portions of the City Heights site are not included within the City of Cle Elum Retail Service Area and the Critical Water Supply Service Area boundaries (see Figure 4.2 in the *Grading, Drainage and Utilities Technical Engineering Report*; Encompass Engineering & Surveying 2010).

POTENTIAL IMPACTS DURING CONSTRUCTION

Construction of a new or expanded water distribution system would be required throughout the City Heights Mixed-Use development within public rights-of-way or utility easements located under or adjacent to City streets, County roads, or private roads within the development (depending on the alternative selected for implementation). Construction activities related to installation of the system would include construction-related traffic to deliver pipe and other material to the site; noise and dust during trenching, excavation, import/export of material; coordinating the installation of other underground utilities; possible temporary disruptions in service to some customers; backfilling, paving and/or overlay of existing streets; and possible disruptions to traffic due to temporary traffic lane closures or detours. Excavations would increase the potential for soil erosion to occur during precipitation events.

Under the No Action Alternative, no water system would be installed on the property; therefore, there would be no utility construction impacts associated with this alternative.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Water Supply

Under any of the conceptual land use alternatives, areas of the City Heights project currently within the City limits (approximately 28 acres) would be served with City water from the City's existing supply, treatment, storage, and distribution system. The City is required to provide water for the equivalent residential units (ERUs) that could be developed in that area. The number of ERUs allowable within this area (based on the minimum residential density allowed within the City limits of 4 dwelling units per

acre) is 112. This number of ERUs is just an estimate; the actual number of ERUs for this area will be determined at a later time.

Northland Resources has applied to the City of Cle Elum to annex approximately 330 acres (i.e., the remainder) of the City Heights site to the City. To address the increased demand on the City's water supply system from that portion of the project to be annexed under Alternative 1 or 2, the City's water policy allows for two options. The developer has the right to either contribute water to the City in sufficient quantity to serve the ERUs in the annexed area, or may purchase water from the City's excess supply at the rate of $3,500 per ERU. Northland Resources could procure and transfer new water rights to the City sufficient to meet the expected annual demand for up to 875 Equivalent Residential Units (ERUs) within the development, and is in the process of seeking approvals from the Department of Ecology for such a transfer. Water required to service up to 110 additional ERUs under Alternative 1 (for a total of 985) would be provided from the City's existing water rights related to the property already within the City limits. Any shortfall in the amount of water rights that Northland Resources can transfer would need to be purchased by Northland from the City. Northland Resources anticipates that it may need to purchase water from the City to serve up to 250 ERUs. Final amounts, to be determined after negotiations conclude with the Department of Ecology, will be included in the terms of the Development Agreement to be negotiated with the City. The Northland Resources water supply proposal is described in Draft EIS Chapter 2, Section 2.9.2; and Chapter 3, Section 3.3 Water Resources.

If a portion of the City Heights project were served through purchase of water from the City of Cle Elum, this would reduce the amount of water held in reserve by the City for future needs. Alternatively, the payment required to purchase the water would provide the City with the financial resources to secure new water rights and water sources to maintain these reserves if needed in the future. These funds could be used by the City to improve service throughout the system.

The water supply requirements of the City Heights Planned Mixed-Use development under Alternative 1 or 2 would increase the workload of City Public Works staff. Booster station(s), reservoir(s), pressure-reducing stations, and miles of water distribution mains to be constructed would require maintenance. Maintenance requirements and costs to the City would be expected to increase with the increase in water system facilities.

It is anticipated that the City would supply water from its existing sources to any public space within the City Heights development that it owns or agrees to serve in the future under Alternative 1 or 2, such as parks, street landscaping, open space and public amenities. Any private parks or amenities to be used only by City Heights residents would be separately metered and provided with water through the water transferred or purchased by Northland Resources. Ownership and maintenance responsibilities would be negotiated in the Development Agreement between the City and the project proponent.

If Alternative 3A or 3B is selected for implementation, the City of Cle Elum would provide water for that portion of the City Heights project already within the City limits (28 acres), but would not provide water service to the 330 acres outside the City limits. For these alternatives (to be developed in the County), water would be supplied by independent Group A community water systems operating with water right permits, or through individual water right permit-exempt wells. Because the bedrock underlying the site produces relatively small quantities of water, it is expected that multiple wells scattered throughout the site would be required to meet the residential demands of either Alternative 3A or 3B.

Water for either Alternative 3A or Alternative 3B could be supplied through the Northland Resources water right. With Alternative 3B, given the potential for independent development of up to 17 parcels,

some of the water could be supplied through the use of exempt groundwater wells.[1] The latter would depend on the status of Ecology's Emergency Rule currently in-place that impacts exempt wells in the Upper Kittitas County area (see Draft EIS Chapter 3, Section 3.3).

Water Demand

Encompass Engineering & Surveying (2010) used an average daily demand (ADD) of 254 gallons per day per residential connection to estimate the water supply requirements of the City Heights Planned Mixed-Use Development. This average daily demand is based upon actual usage within the City of Cle Elum between 2001 and 2005 as shown in the 2006 Water Plan. In addition, this average daily demand was used to forecast future demands and available equivalent residential units (ERUs) for the water system to the year 2026. The City's projected 20-year population shown in the Water Plan is 10,485 compared to the existing population of approximately 1,835 (City of Cle Elum *Comprehensive Plan*: Housing Element [2007]). Commercial water usage was calculated in the 2006 Water Plan based on an ERU value of 6.2 for restaurants and 1.2 ERUs for general commercial. These values are based upon actual usage within the City of Cle Elum between 2001 and 2005, and are used in the 2006 Water Plan to project future commercial water usage. Encompass Engineering included a contingency of 7.5 percent for future uses.

At the time of this writing, it is assumed that convenience retail and professional office uses will comprise the neighborhood commercial development within the City Heights project. Restaurants as a convenience retail use would exert the greatest demand for water; therefore, the water demand calculations for commercial use in the tables below may be conservatively high.

Alternative 1. The water supply average daily demand for City Heights Alternative 1 would be approximately 0.28 million gallons per day (mgd; see Table 3.18.1-1). The largest water usage group would be the proposed 985 detached and attached single-family residential units with an average daily demand (ADD) of approximately 0.25 mgd.

The average daily water demand to serve 20,000 square feet of commercial development in Alternative 1 would be approximately 0.01 mgd. This is based upon the assumptions that approximately 10,000 square feet would consist of restaurant usage and approximately 10,000 square feet would consist general commercial space. Projected water usage by restaurants and general commercial tenants, as shown in the 2006 Water Plan, is 6.2 equivalent residential units (ERUs) for restaurants and 1.2 ERUs per connection for general commercial. Assuming five restaurant connections and seven general commercial connections, the water usage per square foot of commercial space would be approximately 0.5 gallon per day per square foot.

Based on the water demand factors described above, the total average daily water demand to serve City Heights Alternative 1 would be 0.26 mgd. With a 7.5 percent contingency applied for unaccounted water (e.g., leaks and system flushing), the total water supply average daily demand for this Alternative would be approximately 0.28 mgd.

Fire flow demands will be based upon the required flow to a building in gallons per minute and duration in hours for commercial buildings. The maximum fire flow requirement in the City of Cle Elum is 480,000 gallons for a demand of 4,000 gallons per minute for a 2-hour duration. Residential fire flow

[1] The Groundwater Permit Exemption (RCW 90.44.050) allows the users of small quantities of groundwater to construct wells and develop their water supplies without first obtaining a water right permit from Ecology. One groundwater exemption is allowed for any one project regardless of its size, provided that the cumulative total withdrawn from all wells together does not exceed 5,000 gallons per day.

requirements are 120,000 gallons for a demand of 1,000 gallons per minute for a 2-hour duration. Depending upon how development is phased and connected into the existing system, the City Heights Planned Mixed-Use Development may utilize the City's existing water storage facilities to meet fire flow requirements. Additional facilities for fire flow may be required. Fire flow storage would be provided at the start of vertical construction of any residential or commercial structure, under any conceptual land use alternative.

There would be approximately 1,025 ERUs (including the commercial-equivalent ERUs) with Alternative 1. A factor of 20 gallons per ERU is used to project operational storage requirements per the 2006 Water Plan, resulting in operational storage requirements of 20,500 gallons for Alternative 1.

The minimum standby storage requirements per the 2006 Water Plan are 200 gallons times the number of ERUs. With 1,025 ERUs in Alternative 1, the standby storage requirement is 205,000 gallons. "Nesting" of standby storage and fire suppression storage is allowed per the Department of Health 2001 Water System Design Manual; in other words, it may not be necessary to provide both standby storage and fire suppression storage. This determination will be at the discretion of the City or County Fire Marshal, depending on the alternative selected for implementation. Storage will be provided based upon the larger of the two requirements, not both. The City may not require either standby or fire suppression storage due to the capacity in the existing water storage facilities.

The minimum equalizing storage per the Department of Health 2001 Design Manual to meet periodic demands placed on the system that exceed production capacity is equal to 150 times the difference between the peak hour demand and the production capacity. Peak hour demands are provided in the City's 2006 Water Plan for residential, restaurants, and general commercial connections. These values are 1.3 gallons per minute (GPM) per residential connection. Restaurants have an ERU value of 3.5, and general commercial has an ERU value of 0.5. This results in a peak hour demand for Alternative 1 of 1,280.5 GPM for residential connections and 27.3 GPM (1.365 GPM/1,000 square feet) for commercial. Therefore, the total peak hour demand for Alternative 1 is 1,307.8 GPM. If the City Heights Planned Mixed-Use development did not increase the water system production capacity as mitigation, the maximum equalizing storage required for Alternative 1 would be 196,170 gallons. (This is the portion of storage that could be decreased if the source and treatment capacity were increased.)

Table 3.18.1-1. Alternative 1 water supply requirements: the preferred alternative.

Usage Category	No. of Units	Persons per Unit	Population	Assumption	Total ADD[1] (gpd)	Total Annual (ac ft)
Detached Single Family	690	2.4	1,656	254 gpd/ERU	175,260	196.3
Attached Single Family	295	2.4	708	254 gpd/ERU	74,930	83.9
Commercial	20,000[2]			0.5 gal/sq.ft.	10,000	11.2
Unaccounted for Water				7.5% contingency	19,514	21.9
Total					**279,704**	**313.3**

[1] Total Average Daily Demand
[2] Total square footage of commercial development.

Alternative 2. The average daily demand for the Reduced Residential Density Alternative would be approximately 0.26 million gallons per day (mgd; see Table 3.18.1-2). The largest water usage group would be 875 detached and attached single-family residential units with an average daily demand (ADD) of approximately 0.22 mgd. This value is based upon the same average daily demand of 254 gpd per ERU as previously described for the Preferred Alternative. The average daily water demand to serve total commercial development under Alternative 2 (40,000 square feet) would be approximately 0.02 mgd, based upon a usage factor of 0.5 gallon per day per square foot of commercial space. With a 7.5 percent contingency for unaccounted-for water (e.g., leaks and system flushing), the total average daily demand for the Reduced Residential Density Alternative would be 0.26 mgd. Fire flow requirements to serve Alternative 2 would be based on the same parameters described above for Alternative 1. Given the reduced ERU count in Alternative 2, operational storage requirements would be approximately 19,080 gallons.

With 954 ERUs in the Alternative 2 development concept, the standby storage requirement would be 190,800 gallons, with a total peak hour demand of 1,192 GPM. If the City Heights Planned Mixed-Use development did not increase the system production capacity as mitigation, the maximum equalizing storage under Alternative 2 would be 178,815 gallons.

Table 3.18.1-2. Alternative 2 water supply requirements: reduced residential density alternative.

Usage Category	No. of Units	Persons per Unit	Population	Assumption	Total ADD[1] (gpd)	Total Annual (ac ft)
Single Family Detached	525	2.4	1,260	254 gpd/ERU	133,350	149.4
Single Family Attached	350	2.4	840	254 gpd/ERU	88,900	99.6
Commercial	40,000[2]			0.5 gal/sq.ft.	20,000	22.4
Unaccounted for Water	–			7.5% contingency	18,169	20.4
Total					**260,419**	**291.7**

[1] Total Average Daily Demand
[2] Total square footage of commercial development.

Alternative 3A. Alternative 3A is the same conceptual land use scenario as Alternative 2, with the difference being that Alternative 3A would be developed in the County rather within the City limits. Both the City of Cle Elum and Kittitas County utilize the same guidelines for the design of water systems, but how those guidelines are applied may vary. It is assumed that the County's calculation of average daily water demand would be identical to that calculated above for Alternative 2: approximately 0.26 million gallons per day (mgd; see Table 3.18.1-3). Fire flow, standby storage and equalizing storage requirements would also be identical to Alternative 2.

Under Alternative 3A, a Group A community water system would be developed on the site in accordance with Department of Health standards and specifications. The system would also be required to be consistent with adopted Kittitas County comprehensive plans, policies, and development standards. Wells would be developed on or near the property to serve the project. Water treatment would be provided as required by the Department of Health depending on the water quality of the developed

source(s). The amount of storage required would be dependent upon the capacity of the source(s) serving the Group A community water system.

Table 3.18.1-3. Alternative 3A water supply requirements: no annexation, development within the County under single ownership.

Usage Category	No. of Units	Persons per Unit	Population	Assumption	Total ADD[1] (gpd)	Total Annual (ac ft)
Single Family Detached	525	2.4	1,260	254 gpd/ERU	133,350	149.4
Single Family Attached	350	2.4	840	254 gpd/ERU	88,900	99.6
Commercial	40,000[2]			0.5 gal/sq.ft.	20,000	22.4
Unaccounted for Water	–			7.5% contingency	18,169	20.4
Total					**260,419**	**291.7**

[1] Total Average Daily Demand
[2] Total square footage of commercial space.

Alternative 3B. Under Alternative 3B, development of up to 17 individual parcels could occur independently. The average daily water demand for Alternative 3B would be approximately 0.175 million gallons per day (mgd; see Table 3.18.1-4). The water usage group would consist of approximately 500 single-family detached residential units. This value is based on an average daily demand of 350 gallons per day per connection, consistent with the Department of Health 2001 *Water System Design Manual* as it relates to non-municipal water systems.

Under Alternative 3B, multiple water systems with multiple ownerships would be developed on the site. Each individual system would be required to comply with Department of Health and Kittitas County regulations. Water treatment would be provided in accordance with Department of Health requirements, depending on the water quality of the developed sources (i.e., wells). The requirements of each individual water system would vary depending upon the number of connections and lot sizes being served.

Fire flow demands would be based upon on the 2006 International Fire Code and would be required to comply with Kittitas County requirements. If all the parcels were developed in an integrated manner, the maximum residential fire flow requirements of Alternative 3B would be 120,000 gallons for a demand of 1,000 gallons per minute for a 2-hour duration. However, it is likely that under this Alternative, independent Group A water systems would be developed and fire flow and storage requirements would be calculated on a project-by-project basis. Depending on the requirements of the County, fire flow may not be required. If it is required, additional storage requirements would depend on the capacity of the source(s) for the individual systems. If a source were developed to meet the peak hour demand for each individual system, additional storage would not be required in accordance with Department of Health requirements.

Table 3.18.1-4. Alternative 3B water supply requirements: no annexation, development within the County under multiple ownerships.

Usage Category	No. of Units	Persons per Unit	Population	Assumption	Total ADD[1] (gpd)	Total Annual (ac ft)
Single- Family Detached	500	2.4	1,200	350 gpd/ERU	175,000	196

[1] Total Average Daily Demand.

Water Service and System Improvements

If Alternative 1 or 2 is selected for implementation, the entire City Heights project would connect to and utilize the City of Cle Elum water system. Water could be provided from the City's existing sources, or from new groundwater wells on or near the City Heights site. The area of the City Heights site not presently included within the City's Retail Service Area or Critical Water Supply Service Area is directly adjacent to the boundaries of these areas. Prior to the start of any design or construction of the project, these boundaries would have to be updated to include the City Heights Planned Mixed-Use development. This process has commenced.

Both on-site and off-site improvements to the City water system would be needed to serve the City Heights project. New distribution and transmission lines would be constructed, and new storage capacity and additional treatment facility capacity may be needed to supply water to the City Heights project. New reservoirs may be visible from parts of the community. Additional equipment (pumps) at the source of withdrawal may also be necessary to withdraw the additional water, as well as lift stations, booster pumps, and related equipment. Actual impacts would depend upon whether the City water sources and water treatment facility were utilized to serve the City Heights project, or whether new sources of water (i.e., wells) and on-site treatment would be constructed to serve the development.

Based on current water usage and projected water usage for the City Heights project, the City's existing water treatment facility could be capable of serving the water needs of the City Heights project through development of the first 300 to 400 ERUs. In the event that a treatment capacity trigger point is reached prior to that, it is the responsibility of the City of Cle Elum to construct an expansion to the water treatment plant.

If Alternative 3A or 3B is selected, new on-site distribution and transmission lines would be needed, as well as new storage capacity and new treatment facilities to supply water to the City Heights project. Additional equipment at the source of withdrawal (wells and pumps) would also be necessary to withdraw the water, and there would be a potential need for lift stations, booster pumps, and related equipment. Actual water system requirements to serve Alternative 3B would depend on the ultimate design and number of independent projects developed on up to 17 parcels of the site.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. It is typical that as development occurs within local communities, developers are responsible for the initial capital investment costs of infrastructure improvements to mitigate their impacts as part of project approval conditions. It is anticipated that an agreement will be created between the City of Cle Elum and the project proponent to indicate that the costs of improvements required within the City's water system to serve Alternative 1 or 2

of City Heights and all on-site improvements required to supply water to City Heights will be paid by the project proponent and not directly by the City of Cle Elum. Payment could take the form of direct payment by the project proponent , through some form of City-sponsored financing such as a Local Improvement District sponsored by Cle Elum (completely paid for by the project proponent, not with City funds), or through grant money secured by the City of Cle Elum (with the costs of application and procurement funded by the project proponent and not the City).

The proposed development under Alternative 1 or 2 would incorporate low-flow faucets, toilets, and other similar fixtures to minimize domestic water supply requirements. Water meters would be installed at each building, or at another connection point using water and pipe/meter sizes to be determined on the basis of domestic flow volumes and fire flow needs. Increased operating and maintenance costs accrued by the City would be recovered through utility rates paid by the actual users of the water system.

Under Alternative 3A or 3B (to be developed in the County), either a Satellite Management Agency would operate the on-site water system(s), or a Homeowners' Association would become a certified operator. In the latter case, three trained employees would be required to manage the system.

All reasonable efforts will be made to locate new water reservoirs with minimal visual impacts.

Best management practices would be implemented during the construction of utilities to minimize noise, dust, and erosion potential (see Section 3.18.3, below).

Applicable Regulations. Surface water rights in Washington State are governed under Chapter 90.03 Revised Code of Washington (RCW), and groundwater rights are governed under Chapter 90.44 RCW. A new water right can be issued only if the Washington Department of Ecology (Ecology) determines that: 1) water is available for appropriation, 2) the appropriation would not impair other senior water rights, 3) the proposed use is a beneficial use, and 4) the appropriation would not be detrimental to the public interest. The relationship of the Northland Resources water rights proposal to Ecology's regulations is described in Draft EIS Section 3.3 Water Resources.

Whether potable water for the proposed City Heights Planned Mixed-Use development is provided by the City of Cle Elum (to serve Alternative 1 or 2) or through an independent on-site community water system (to serve Alternative 3A or 3B), infrastructure design and construction will comply with applicable City of Cle Elum or Kittitas County standards and specifications (depending on the alternative selected), Washington State Department of Health and other State regulations. Both the City of Cle Elum and Kittitas County Fire Marshal utilize the 2006 International Fire Code (IFC) as a basis of their requirements. Fire suppression systems would be required to meet IFC standards and Department of Health requirements for fire flow and pressure. Specific building designs will determine these requirements at the time building permit applications are submitted.

Under Alternative 1 or 2, if water were delivered to the City Heights project from the City's existing water treatment plant, a water transmission line would need to be constructed from the plant within the Washington State Department of Transportation (WSDOT) SR 903 right-of-way, and that may run within the Bonneville Power Association (BPA) and/or Puget Sound Energy (PSE) power line easements to reach the City Heights site. These entities would need to be consulted during the design phase, and an easement would be needed from WSDOT.

If Alternative 3A or 3B is selected for implementation, no additional hydrologeological analysis would be required prior to approval of wells to serve either of these alternatives, as potential effects to down-gradient water users will have been considered in Ecology's process to approve the Northland

Resources water rights transfer to serve the City Heights development under any conceptual land use alternative.

Other Recommended Mitigation Measures. Construction contractors should be required to notify existing water system customers well in advance of temporary interruptions to service (if any) during construction of connections to the City's existing water distribution system.

For any of the four conceptual land use alternatives, the project's Covenants, Conditions and Restrictions (CC&Rs) could require homeowners to install only drought-tolerant (i.e., xeric) landscaping to minimize irrigation requirements.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

No significant unavoidable adverse impact to the operation and maintenance of the City of Cle Elum water system or to existing City water system customers is anticipated. The Development Agreement to be negotiated between the City and the project proponent under Alternative 1 or 2 will specify developer cost responsibilities for capital improvements to the system. New users within City Heights will be required to pay connection fees and monthly service fees established by the City.

There would be no net loss of water in the basin as a result of the Northland Resources water bank proposal because the water currently consumed would be transferred from one use (irrigation) to a different use (residential and neighborhood commercial development) within the City Heights project. There would be no increase in the quantity of water used. The seasonal difference in use would be mitigated through storage and release of the stored amounts during winter months.

3.18.2 Sewer Service

AFFECTED ENVIRONMENT

The City of Cle Elum wastewater collection and treatment system serves the incorporated area, including the Bullfrog Urban Growth Area (UGA) properties, the Town of South Cle Elum, the City of Roslyln, and the Suncadia Resort (the "Sewer Parties"). The City of Roslyn also has an agreement with the City of Ronald to accept a portion of their wastewater. The Upper Kittitas County Regional Wastewater Treatment Facilities Project Agreement, Development Agreement and Service Agreement, as amended (the "Sewer Agreement"), guides the construction, use and operation of the Cle Elum wastewater collection and treatment system.

There is no formal comprehensive plan for the City's existing wastewater collection and treatment system; however, a Regional Sewerage Facilities Plan prepared by EarthTech (September 2002) was utilized as the basis for determining the needs and capacity of the existing system. The Facilities Plan was based on project-specific growth projections, and it allocated capacity to the Sewer Parties. It referenced future population growth and projected wastewater flows within a Regional Service Area that did not include the north Urban Growth Area in which the City Heights site is located (since this area had not yet been designated UGA at that time), but did include the portions of the site that are already within the City limits (approximately 28 acres). The Facilities Plan identified, along with existing customers in Cle Elum, approximately 215 residential units for unspecified future growth within the City of Cle Elum; however, the number of connections allocated to each of the four Sewer Parties have been verified and it now appears that Cle Elum has fully-committed its wastewater treatment plant capacity.

Existing Collection System

Wastewater is currently collected in the City of Cle Elum sewer trunk line that initiates in the Suncadia Resort and runs east through the Bullfrog UGA, and then east along Second Street to the City's wastewater treatment plant located south of 1st Street East (SR 970) and north of Interstate 90, near the east end of the Cle Elum City limits (see Figure 3.8-1 in the Draft EIS Land Use section). This trunk line generally ranges in size from 21 to 30 inches in diameter. A small portion leading to the headworks is 36 inches in diameter. There are two other trunk lines that ultimately connect to the Cle Elum sewer trunk line, one originating in Roslyn that runs adjacent to Crystal Creek to a point of connection near Stafford Avenue in Cle Elum, and another originating in South Cle Elum that extends eastward along the south side of the Burlington Northern-Santa Fe (BNSF) railroad tracks to Owens Road (the access road to the sewer treatment plant) where it connects into the Cle Elum sewer trunk line headworks.

The Cle Elum sewer trunk line was designed for a build-out capacity of approximately 10.5 million gallons per day (mgpd), to meet seasonal high wastewater flows during the maximum winter month (March) within the service area. There is a substantial amount of unused capacity within the existing Cle Elum sewer trunk line, since much of the development anticipated within the Suncadia Resort and the Bullfrog UGA (the "Suncadia Projects") has not yet occurred.

Existing Treatment Facility

The Cle Elum wastewater treatment plant contains headworks, an influent pump station, two operating sequencing batch reactors (SBRs), an empty cell that would allow an additional SBR to be constructed, and an ultra-violet light disinfection station. Since 2002, total monthly influent flows to the treatment plant have ranged from 7.652 million gallons (mg) to 78.169 mg – considerably below the design capacity of the treatment plant. Flows vary depending on tourism, snow melt, rainfall, and infiltration/inflow.

Based on Washington Department of Ecology (Ecology) regulations, there are certain thresholds that, when exceeded, require additional capacity to be considered and potentially constructed at the City's wastewater treatment plant. When actual performance of the treatment facility reaches or exceeds 85 percent of any one of the design standards for a period of three consecutive months, Ecology will require the City to start studying and planning for treatment plant expansion, with the ultimate timing of expansion to be determined based on the results of this planning. Design standards that affect the treatment plant capacity decision include: monthly average flow (3.6 mgd), instantaneous peak flow (10.5 mgd), biological oxygen demand (BOD) influent loading (4,850 lb/day), and total suspended solids (TSS) influent loading (3,750 lb/day).

The Facilities Plan made some general assumptions about the quantity of infiltration/inflow within the City limits of Roslyn, Cle Elum, and South Cle Elum when determining the capacity of the treatment plant. Those estimates reflected higher than normal design standards for infiltration/inflow due to combined sewer and storm drainage systems within the service area, and larger than average inflow within the existing conveyance system. [2] It is possible that additional capacity could be created within the existing wastewater collection and treatment system if infiltration/inflow levels in Cle Elum were reduced to levels below those assumed in the Facilities Plan.

[2] Infiltration and inflow can be the result of, among other things, stormwater connections to sewer lines (such as downspouts or sump pumps in basements), water entering the sewer system through manholes, and leaks in the collection system piping. On January 6, 2010, the City authorized a study of infiltration/inflow in the existing sewage collection system, anticipated to be complete by late April or early May 2010.

Existing Outfall

The existing wastewater treatment plant outfall is a 24-inch diameter ductile iron pipe that extends west from the plant in Dalle Road, then south in a boring beneath Interstate 90, between Hanson Pond 2 and Kiwnis Pond, to a point of discharge in the center of the Yakima River secured by a rock drop (broad-crested weir). See Figure 3.8-1 in the Draft EIS Land Use section. The outfall discharges Class A treated effluent from the SBR process.

The existing outfall was built extremely flat under low head conditions. When the Yakima River is experiencing high flows, the outfall pipe experiences a backwater condition.

SEWER SERVICE OPTIONS

There are three potential methods of physically handling wastewater from the City Heights project. With any of the build alternatives, wastewater from the City Heights project could be incorporated into the existing Cle Elum wastewater collection and treatment system ("Public System"); however, for Alternatives 3A or 3B, the City would need to agree to provide sewer service to a project in the UGA but outside the City limits (except for the 28 acres of the City Heights property already within the City limits).[3] For Alternatives 1, 2 or 3A, wastewater could be treated with an on-site Membrane Bioreactor (MBR) plant, with the treated effluent potentially utilized for seasonal on-site irrigation, and the remainder discharged to the Yakima River (MBR System). For Alternative 3A or 3B, an additional option could be to treat wastewater within On-site Sewage Disposal Systems.

Public System

The most efficient points of connection and means of serving the City Heights project from the existing Cle Elum wastewater collection and treatment system would be determined during final site design. There are six possibilities for delivering project wastewater to the Cle Elum wastewater treatment plant and treating the wastewater generated by the project. The first three options rely on utilization of the existing Cle Elum sewer trunk line in Second Street, while the others discuss alternative sewer trunk line locations.

- *The Borrow Option*. Wastewater generated in the early phases of the City Heights project could be conveyed and treated in the existing system if presently-unused capacity could be allocated to the project. At some point in time, if all or a substantial part of planned development within the Suncadia Projects is built and occupied, the existing Cle Elum sewer trunk line would not have the capacity to serve more than approximately 215 ERUs of the City Heights project, assuming the levels of infiltration and inflow allocated to the City of Cle Elum by the Facilities Plan are met or exceeded. At that time, one of the other options listed below would be implemented.

  Depending on the pace of development within the Suncadia Properties and the timing of the construction of the additional treatment plant capacity required by Ecology (if any), the existing wastewater treatment facility could be capable of providing capacity for the early stages of the City Heights development. At some point in time, if all or a substantial quantity of the planned development within the Suncadia Properties is built and occupied, the existing treatment plant would not have the capacity to serve the City Heights project assuming the levels of infiltration/inflow

[3] The City Capital Facilities Element of the City of Cle Elum Comprehensive Plan does not presently include a policy regarding when and where urban services (such as water and sewer) would be provided to properties within its UGA if these areas are not within the City limits. Therefore, it cannot be assumed that the City could or would provide urban services to the 330 acres of City Heights under Alternative 3A or 3B.

allocated to the City of Cle Elum in the Facilities Plan are met or exceeded. Within the Sewer Agreement, capacity is allocated to individual Sewer Parties, so although there may be overall capacity based on the current status of development of the Suncadia Properties, a particular Sewer Party (such as the City of Cle Elum) may or may not have capacity to allocate to the City Heights project.

- *The Purchase Option*. Capacity within the existing collection system and wastewater treatment facility could be purchased from a party to the Sewer Agreement that would allow the existing trunk line along Second Street to be utilized.

- *The Infiltration/Inflow Option*. Capacity within the existing collection system and wastewater treatment facility could be secured from a party to the Sewer Agreement by reducing the amount of actual infiltration/inflow attributed to that party, thereby reducing flows that would create capacity to transport wastewater from the City Heights project within the Second Street trunk line.

- *The On-Site Option*. A sewer trunk line could be constructed on the City Heights site that would collect wastewater, exit the site from the east end (in or near Columbia Avenue), and independently tie into the existing wastewater treatment plant. This trunk line would require design, construction, and authorization to extend to the wastewater trunk line beneath SR 970 (a WSDOT right-of-way), the BNSF railroad line, Younger Ditch, and the City of Cle Elum Second Street storm drainage ditch. This option would also require making improvements to the treatment plant to increase capacity.

- *The Third Street Option*. A sewer trunk line could be constructed within the Third Street right-of-way to create additional collection capacity. This sewer trunk line would also extend to the existing treatment plant beneath SR 970 (a WSDOT right-of-way), the BNSF railroad line, Younger Ditch, and the City of Cle Elum Second Street storm drainage ditch. This option would also require making improvements to increase the treatment plant capacity.

- Some combination of the above options could be selected.

MBR System

In the case of a MBR System to serve Alternatives 1, 2 or 3A, one or more MBR plants would be constructed on the City Heights site. A collection system would transport the sewage from individual homes to a central processing plant on-site where the sewage would be filtered and treated. Effluent from that plant would then be transported either to on-site landscape irrigation uses or off-site to a point of discharge into the Yakima River (subject to obtaining all required permits and approvals for a new outfall to the river). When used to treat domestic wastewater, the MBR process produces effluent of Class A water quality standards, suitable for reuse in irrigation or other applications, or for discharge into waterways. Basically, sewage is transported to a bioreactor where bacteria remove much of the toxic elements and then the liquid is passed through a membrane. The resulting effluent is then suitable for various reuse applications, or suitable for discharge as with other wastewater treatment facilities. MBR effluent discharge would be at least seasonally necessary during winter months when landscape irrigation is not possible.

If an MBR system becomes the preferred option for the provision of wastewater collection and treatment for the City Heights project, additional studies would be required to confirm the engineering details and feasibility of this element of the proposal.

On-Site Sewage Disposal Systems (OSDS)

In the case of on-site sewage disposal systems to serve Alternative 3A or 3B, either community on-site sewage disposal systems (Alternative 3A) or individual systems (Alternative 3B only) would be constructed on the City Heights site. These systems are self-contained and would not require any off-site improvements. They are regulated by the Washington Department of Health and the Washington Department of Ecology. Sewage would be transported to a filtering tank (or other means of filtering such as a sand pit) where the wastewater would be treated. The effluent would then be transported to a drainfield, in which it would be discharged into the ground for additional treatment through soils. In community systems, a collection system of pipes would carry the effluent to a large drainfield, either via gravity or through a series of lift stations. The drainfield would consist of several distribution pipes, and would include a reserve field. Community on-site sewage disposal systems to serve Alternative 3A would require perpetual maintenance and management under the responsibility of a management system approved by Kittitas County.

If Alternative 3A or 3B is selected for implementation, and if on-site sewage disposal systems become the preferred option for waterwater collection and treatment on the City Heights site, additional soil testing and preliminary engineering analysis would be required in compliance with Chapter 246-272A of the Washington Administrative Code (WAC) to determine the number of residential units that could realistically be developed on the property with OSDS and on-site Group A community water system wells or individual wells.

POTENTIAL IMPACTS DURING CONSTRUCTION

Public System

Under the *Borrow Option*, there would be no off-site construction impacts in the early stages of the City Heights project, as wastewater flows would discharge to the existing Cle Elum sewer trunk line. Thereafter, one of the other collection system options would be implemented. Under the *Purchase Option*, if permanent capacity was purchased there would be no off-site collection system construction impacts associated with the City Heights project; however, if permanent capacity was not purchased or the *On-Site Option* or *Third Street Option* were selected, an additional sewer trunk line would be required to extend an independent connection to the treatment plant crossing beneath the WSDOT right-of-way (SR 970), the BNSF railroad right-of-way, Younger irrigation ditch, and potentially the City of Cle Elum Second Street storm drainage ditch at the east end of town. Construction methods could include directional drilling or boring. If the *Infiltration/Inflow Option* were selected, construction requirements could include the installation of additional stormwater trunk lines and modifications to existing stormwater systems, such as adding connections to existing stormwater conveyance systems and removing connections that transport stormwater to the wastewater collection system.

Regardless of the off-site collection system option selected for implementation, development of the City Heights project would require installation of an on-site sewage collection system and individual connections to serve homes and neighborhood commercial development, and to connect to the City's wastewater collection and treatment system. The on-site conveyance system would be constructed within public rights-of-way or easements located under or adjacent to City streets or private roads within the development. In addition, pipeline construction would be required from the site to the point of connection to the City's existing system (or other alternative treatment facilities).

Construction activities related to the installation of wastewater conveyance mains both on-site and off-site would include construction-related traffic to deliver pipe and other material to the site; noise and dust during trenching, excavation, import/export of material; resolving conflicts with other underground

utilities; possible temporary disruptions in service to some customers; backfilling, paving and/or overlay of existing streets; and possible disruptions to traffic due to temporary traffic lane closures or detours.

If expansion of the City's existing wastewater treatment plant were necessary under any of the sewer service options, the required upgrades could be as simple as adding additional screening at the effluent station, or it could involve more substantial upgrades as described in *Grading, Drainage and Utilities Technical Engineering Report* Section 5.3.6. Construction activities related to upgrading the treatment facility would include dust and noise during the construction phase, construction-related traffic to deliver materials to the treatment plant site at the end of Owens Road, and potential temporary short-term shutdowns of the treatment facility (for a period of hours).

It would likely be necessary to modify the existing Cle Elum wastewater treatment plant outfall to accommodate the increased design flow from the City Heights development at some point in time, unless a permanent allocation of capacity were to occur as a result of the *Purchase Option* or the *Infiltration/Inflow Option*. The outfall would more than likely require the addition of an effluent pump station or modifications to an existing station to pressurize the flow to avoid the need to construct a second outfall.

MBR System

An MBR system would require both on-site and off-site construction. Impacts would be similar whether conceptual land use Alternative 1, 2 or 3A is selected for implementation. An on-site collection system would be needed as would an outfall to the Yakima River (subject to acquiring all applicable permits and approvals for a new outfall to the river). Construction activities related to installation of a MBR System both on-site and off-site would include construction-related traffic to deliver materials to the site; noise and dust during trenching, excavation, import/export of material; resolving conflicts with other underground utilities; possible temporary disruptions in service to some customers; backfilling, paving and/or overlay of existing streets; and possible disruptions to traffic due to temporary traffic lane closures or detours. The construction impacts of the outfall to the river would depend on the design of this project component. In any event, it would require conveyance beneath SR 970 and Interstate 90 (WSDOT rights-of-way), and through the north levee of the river.

On-Site Sewage Disposal Systems

Under Alternative 3A or 3B, if on-site sewage disposal systems (OSDS) were utilized, the impacts during construction would be primarily focused on the City Heights site. Construction of the OSDS would require additional clearing and excavation. Construction activities related to the installation of OSDS would be similar to the other options; i.e., construction-related traffic would deliver pipe and other material to the site; noise and dust would be generated during trenching, excavation, import/export of material and backfilling.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Sanitary sewer demand estimates for the City Heights conceptual land use alternatives were calculated based on the land use elements of each concept. These are briefly described below.

Alternative 1 – Preferred Alternative. The City Heights Preferred Alternative includes 985 dwelling units and 20,000 square feet of neighborhood commercial development. This conceptual land use scenario would generate a total average daily wastewater flow of approximately 212,834 gallons per day (gpd), based on 80 percent of total water usage, and a Winter Peak Hour Flow of approximately 931,148 gpd. Residential use, based on the Facilities Plan factor of approximately 2.4 persons per residential dwelling

unit, would generate average daily wastewater flow of approximately 204,818 gpd, and a Winter Peak Hour Flow of approximately 896,082 gpd. The average daily wastewater demand to serve total commercial development under the Preferred Alternative would be approximately 8,016 gpd, with a Winter Peak Hour Flow of approximately 35,066 gpd. The projected sanitary sewer demand includes rain-dependent infiltration/inflow for summer and winter months.

Alternative 2 – Reduced Residential Density. The Alternative 2 conceptual land use plan includes 875 dwelling units and 40,000 sf of neighborhood commercial development. This conceptual land use scenario would generate a total average daily wastewater flow of approximately 192,834 gpd based on 80 percent of total water usage, and a Winter Peak Hour Flow of approximately 843,649 gpd. Residential use, based on the Facilities Plan factor of approximately 2.4 persons per residential dwelling unit, would generate average daily wastewater flow of approximately 176,803 gpd, and a Winter Peak Hour Flow of approximately 773,517 gpd. The average daily wastewater demand to serve total commercial development under Alternative 2 would be approximately 16,031 gpd, with a Winter Peak Hour Flow of 70,132 gpd. The projected sanitary sewer demand includes rain-dependent infiltration/inflow for summer and winter months.

Alternative 3A – No Annexation, Development within the County under Single Ownership. Alternative 3A is the same conceptual land use scenario as Alternative 2, with the difference being that Alternative 3A would be developed in the County rather than within the City limits. The calculation of total average daily wastewater flows would be identical to those calculated above for Alternative 2. Under Alternative 3A, sewage treatment may occur through on-site sewage disposal systems rather than through connection to City sewer system, depending on the City's willingness to serve the project outside the City limits but within its UGA.[4]

Alternative 3B – No Annexation, Development within the County under Multiple Ownerships. Alternative 3B would generate a total average daily wastewater flow of approximately 103,758 gpd based on 80 percent of total water usage, with a Winter Peak Hour Flow of approximately 453,942 gpd. The entire flow estimate for this alternative is based on residential use only, and includes rain dependent infiltration/inflow for summer and winter months.[5] Sewage treatment under Alternative 3B could be provided through on-site sewage disposal systems rather than through connection to the City sewer system, depending on the City's willingness to serve a project outside the City limits but within its UGA.[4]

Alternative 4 – No Action. Under the No Action Alternative, it is assumed that the City Heights site would remain undeveloped, and therefore would not require any sewage collection system infrastructure or capacity, or wastewater treatment plant capacity.

[4] The City of Cle Elum Comprehensive Plan: Capital Facilities Element does not presently include a policy regarding when and where urban services (such as sewer and water) would be available in the UGA if this property were to remain outside the City limits. For this reason, it cannot be assumed that the City would provide sewer service to Alternative 3A or 3B.

[5] The infiltration/inflow calculation would be applicable to design of the Alternative 3A or 3B on-site sewage disposal systems, as OSDS also experience some level of infiltration/inflow.

The estimated peak hour sewage flows of the four conceptual land use alternatives are shown in Table 3.18.2-1. These estimates are correlated to domestic water demand (described below).

Table 3.18.2-1. Estimated peak hour sewage flows for the City Heights conceptual land use alternatives.

	Estimated Peak Hour Flows (in gallons per day)			
	Alternative 1	**Alternative 2**	**Alternative 3A**	**Alternative 3B**
Winter Peak Hour Flows	931,148 gpd	843,649 gpd	843,649 gpd	453,942 gpd
Summer Peak Hour Flows	856,656 gpd	776,157 gpd	776,157 gpd	417,627 gpd

Similar to the water supply requirements of the project, the projected wastewater volume that would be generated by three of the four conceptual land use alternatives (Alternative 1, 2 or 3A) would differ by less than 10 percent, with Alternative 1 generating the largest volume of wastewater. The projected range of winter peak hour flow between Alternative 1 and Alternative 3B is approximately 0.931 million gallons per day (mgpd) to 0.454 mgpd, which would constitute an 8.0 percent or 4.3 percent increase, respectively, over the design flows used in the Facilities Plan for the trunk line and wastewater treatment plant (10.5 mgpd total capacity). Wastewater generated by Alternative 3B would be approximately 50 percent less than Alternative 1 if served by City sewer; however, given that Alternatives 3B (and 3A) assume development within the County and not the City, all but 28 acres would be served by individual or community on-site sewage disposal systems unless the City agreed to provide service outside the City limits (for which there is currently no policy in the Capital Facilities Element of the City's Comprehensive Plan).

The Facilities Plan (EarthTech, September 2002) calculated wastewater flow based on a percentage of domestic water usage. It assumed that 80 percent of water delivered to each household or commercial structure would contribute to sewer flow. This assumes that 20 percent of potable water supply is not returned to the sewer system as a result of being consumed by cooking and other consumptive uses such as irrigation, and that some water will be lost to evaporation. The Facilities Plan used a factor of 100 gallons of water consumption per person per day for residential development, then applied a factor of 80 percent to estimate average daily wastewater flow. To estimate the City Heights sewer demand, the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010) used an updated water consumption factor (113.7 gallons per person per day), consistent with the Water section of their report, and consistent with actual usage per the City of Cle Elum *Water Comprehensive Plan*.

The potential sewage collection and treatment impacts of the City Heights project would depend on the method selected for providing service: a *Public System*, a *MBR System*, or *On-site Sewage Disposal Systems*, described below.

Public System

The *Facilities Plan* identified, along with existing customers in Cle Elum, approximately 215 residential units for unspecified growth within the City of Cle Elum; however, the number of connections allocated to each of the existing Sewer Parties have been verified and it now appears that Cle Elum has fully-committed its wastewater treatment plant capacity. If a permanent transfer of capacity could not be arranged through the *Borrow Option*, *Purchase Option*, or *Infiltration/Inflow Option* described above, then additional hydraulic, organic, and/or solids loading generated by City Heights would exceed the

design capacity of the City's existing wastewater collection and treatment facilities, and system upgrades would be required to serve the development. If capacity could be permanently transferred to City Heights through one of the collection system options, no impacts would occur to the City's system. In either event, additional piping would need to be constructed within the City Heights development (at the developer's expense) to convey wastewater to the existing Cle Elum Second Street sewer trunk line. The capacity analysis of the existing downstream wastewater collection system would be performed in the final design phase.

Impacts of the on-site collection system and possible off-site components that would be constructed under some collection system options would involve routine inspection and maintenance of the system. These requirements would increase City staff time to provide these services. If the *On-site Option* were selected, maintenance and repair requirements over time may be higher in comparison to the other options due to the need for lift stations and other capital equipment to facilitate the operation of that system.

The Cle Elum wastewater treatment plant is currently underutilized, and therefore operates at less than optimal standards of efficiency. Adding the City Heights flows to the system would improve operational efficiency. Overall, however, upgrades to the treatment plant would increase maintenance responsibility for plant staff. This would likely eventually result in increases in operating costs and maintenance expenses.

If pumping modifications could be made to increase the capacity of the existing wastewater treatment plant outfall, developed-condition impacts would likely be characterized by some increase in operation and maintenance costs.

MBR System

If a MBR System were selected as the method of wastewater treatment for Alternative 1, 2, or 3A the City Heights project, there would be no impacts to the existing Cle Elum wastewater collection and treatment system. A MBR system would, however, result in the discharge of Class A reclaimed water to the Yakima River during at least the winter months of the year when landscape irrigation with reclaimed water would not be possible. Alternative 1, 2, or 3A would generate a similar quantity of wastewater to be collected and treated (see Table 3.18.2-1). The MBR System would not be utilized for Alternative 3B.

On-Site Sewage Disposal Systems

Under Alternative 3A or 3B, on-site sewage disposal systems may be constructed on the City Heights site. This would have no impact to the capacity or operation of the existing Cle Elum wastewater collection and treatment system. It would, however, result in a significant number of on-site sewage disposal systems being introduced on the hillside above the existing City limits. On-site sewage disposal systems could result in water quality issues (potential groundwater quality contamination and the migration of nutrients to streams and wetlands) over time as these systems deteriorate. Groundwater saturation attributable to these systems could affect slope stability if not properly designed, constructed, and maintained.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal

Public System. Mitigation measures for the wastewater collection and treatment requirements of Alternative 1, 2 or 3A would be approximately the same. The Upper Kittitas County Regional Wastewater Treatment Facilities Project Agreement, Development Agreement and Service Agreement, as

amended (the Service Agreement), guides the construction, use and operation of the Cle Elum wastewater collection and treatment system. In accordance with the Service Agreement, a Capital Recovery Charge is currently charged by the City of Cle Elum to all new ERUs utilizing the existing system. These funds are remitted to Suncadia. As noted above, the City of Cle Elum does not have any existing wastewater system capacity to allocate to the needs of the City Heights project; therefore, it is presently unclear how the project could be served by the City's wastewater collection system. Any costs associated with allocating existing capacity in the wastewater collection and treatment system to the City Heights project would be imposed through the Development Agreement, requiring the project proponent to reimburse costs as lots were developed and connected to the City's infrastructure.

If the *Borrow Option*, *Purchase Option*, or *Infiltration/Inflow Option* for the collection system were selected, existing capacity would be rented or purchased and the compensation would be negotiated between the parties.

In the event that collection and treatment system capacity could not be secured on a permanent basis under the *Purchase Option* or the *Infiltration/Inflow Option*, then the developer would be responsible for the initial capital investment costs of infrastructure improvements required to serve City Heights as an element of project approval conditions. It is anticipated that an agreement will be created between the City of Cle Elum and the City Heights Planned Mixed-Use development providing that the costs of improvements required within the City of Cle Elum sewer system to serve City Heights and all on-site improvements required to supply service to the project would be paid for by the project proponent and not directly by the City of Cle Elum. Payment could take the form of direct payment by the project proponent, through some form of City-sponsored financing such as a Local Improvement District (completely paid for by the project proponent, not with City funds), or through grant money secured by the City of Cle Elum (with the costs of application and procurement funded by the project proponent, not the City). Under no circumstance would costs to provide sewer service to the City Heights development be borne directly by the City of Cle Elum or existing sewer service customers.

Increased operating and maintenance costs accrued by the City would be recovered by utility rates paid by the actual City Heights users of the wastewater collection and treatment system.

MBR System. A MBR system could be implemented to serve Alternative 1, 2 or 3A. Proper design and operation of a MBR plant would produce reclaimed water that would meet Class A water quality standards for possible seasonal reuse on-site for landscape irrigation, and for discharge to the Yakima River (subject to obtaining all required permits and approvals for a new outfall to the river).

On-Site Sewage Disposal Systems. On-site sewage disposal systems could be used to serve Alternative 3A or Alternative 3B. When these systems are properly designed, installed, and maintained in accordance with applicable regulations, they would not be a source of impact to the environment until they no longer functioned properly and required upgrade or replacement.

Applicable Regulations

Public System. Under any conceptual land use alternative that would be served by the City of Cle Elum sewage collection and treatment system, modifications or additions to the existing wastewater collection and treatment system would be designed and constructed in accordance with applicable standards set forth by the City of Cle Elum, the Washington State Department of Health, and the Washington Department of Ecology (Ecology). The City may be required to prepare and submit a Sewer Comprehensive Plan to these State agencies to address the addition of the new development to the existing regional sewer system. If the *On-Site Option* or the *Third Street Option* were selected, construction of a new trunk line from City Heights to the treatment facility would also require permits and

approvals from several agencies, including the U.S. Army Corps of Engineers, Ecology, Washington Department of Fish and Wildlife (WDFW), Washington State Department of Transportation (WSDOT), the Burlington Northern-Santa Fe (BNSF) Railroad, and City of Cle Elum.

MBR System. If a MBR system were selected to serve Alternative 1, 2 or 3A, this system would be designed, constructed, and operated in accordance with the manufacturer's specifications and standards for reclaimed water jointly developed by the Department of Health and Ecology. Within the State of Washington, the quality of reclaimed water must fully protect beneficial uses including public health and environmental water quality. These regulations are updated periodically in order to incorporate the latest protection standards. An outfall discharge to the Yakima River under this option would be required to obtain construction permits from the City of Cle Elum, Washington State Department of Transportation (WSDOT) and the Burlington Northern-Santa Fe Railroad (BNSF) to cross rights-of-way between the City Heights site and the river, and to obtain permits from WDFW, WDNR, the U.S. Army Corps of Engineers, and Ecology (at a minimum) for construction and discharge from a new outfall to the river.

On-Site Sewage Disposal Systems. If on-site sewage disposal systems (OSDS) were installed within the City Heights development under Alternative 3A or 3B, the project would be required to comply with Kittitas County, the Department of Health, and Ecology regulations governing the design, construction, operation, and maintenance of these systems. Community on-site sewage disposal systems to serve Alternative 3A would require perpetual maintenance and management under the responsibility of a management system approved by Kittitas County (KCC 13.04.180).

Other Recommended Mitigation Measures

Construction contractors should be required to notify existing sewer system users well in advance of temporary interruptions to service (if any) during construction of the City Heights connections to the Cle Elum sewer trunk line.

Because the existing wastewater collection and treatment system was sized for project-specific growth known at the time the Facilities Plan was prepared, any new development could potentially require significant system upgrades and improvements. It is possible that the Sewer Parties may want to consider a different treatment process at the plant to upgrade the technology from the Sequencing Batch Reactor (SBR) process. Newer processes could improve efficiency, capacity, and the level of treatment while simultaneously reducing maintenance costs.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Public System. If it is necessary to upgrade and expand the City's wastewater collection and treatment system to serve full build-out of Alternative 1 or 2 of the City Heights Planned Mixed-Use Development, the Development Agreement to be negotiated between the City and the project proponent would specify developer cost responsibilities to avoid adverse impacts to the City or existing sewer system customers. New users within City Heights will be required to pay connection fees and monthly service fees established by the City. For all of these reasons, there should be no significant unavoidable adverse impact to the operation and maintenance of the system, or to existing sewer system customers.

MBR System. If an MBR system were properly designed and operated in accordance with the manufacturer's specifications and all applicable regulations, this sewer service option would generate Class A reclaimed water for beneficial uses on the site, and for at least seasonal discharge to the Yakima River. Due to the quality of the effluent produced by the MBR process, this option should not result in a significant unavoidable adverse impact to the river.

On-Site Sewage Disposal Systems. If on-site sewage disposal systems are properly designed, installed, and maintained in accordance with applicable regulations, they would not be a source of significant unavoidable adverse impacts.

3.18.3 Stormwater Management

This section describes options for the management and mitigation of stormwater generated within the City Heights Planned Mixed-Use Development, both during construction and in the developed condition of the project.

AFFECTED ENVIRONMENT

Watershed Description

The City Heights site is located in the northwest quadrant of the Upper Yakima River Watershed that drains an area 2,139 square miles in size. Elevations range from about 7,000 feet above sea level at the crest of the Cascade Mountains to about 1,000 feet above sea level at the confluence of the Yakima and Naches Rivers. This confluence also forms the upper boundary of the Lower Yakima River watershed. The Upper Yakima River watershed is predominantly forested (1,153 square miles) in its higher elevations, and contains 85,000 acres of irrigated agriculture in its lower elevations. The majority of irrigated acreage drains to the tributaries of Wilson Creek, Manastash Creek, and Sorenson Creek, south/southeast of Cle Elum. Below the outlet of the Lake Keechelus dam, the main tributaries to the Upper Yakima River are the Kachess River, Cle Elum River, and Teanaway River. There are numerous other smaller tributaries to the Upper Yakima River.

There are no known basin studies produced for the watershed that includes the City Heights site. For the purpose of this analysis, the sub-basin for the proposed City Heights Planned Mixed-Use Development was delineated by Encompass Engineering & Surveying (2010) based on USGS maps and other available information. The project site is within the sub-basin located on the north side of the City of Cle Elum, encompassing an area from the Town of Roslyn on the west, Cottage Avenue in the City of Cle Elum on the east, the top of Cle Elum Ridge on the north, Third Street and SR-903 within the City of Cle Elum on the south. This sub-basin is approximately 470 acres in size. Crystal Creek, multiple unnamed seasonal streams, and the City of Cle Elum stormwater management system are the principal surface water features within the sub-basin that includes the project site.

Drainage Basin Descriptions

Based on preliminary findings, the majority of the City Heights property contributes hydrology to four significant drainage basins. These basins directly affect Crystal Creek, several other seasonal streams, and irrigation ditches. These basins are strongly influenced by snow melt and recharge over the upland areas, including on the City Heights property. Encompass Engineering & Surveying analyzed the aerial topographic map prepared by Degross Aerial Mapping, Inc. (2009), and delineated five separate drainage basins that include the City Heights site (see Figure 3.18.3-1). The level of detail utilized for delineation of these drainage basins is appropriate for the preliminary storm drainage calculation and analysis for the entire project site. A more detailed analysis of the drainage basins is recommended for the construction design. Existing drainage basins are described below.

Basin A. Drainage Basin A is located in the western-most area of the project site, and consists of 822.91 acres of forest land, underlain with ashy and Teanaway loam soils. Only 84.64 acres of this basin is considered in the analysis, as the rest of the area will be by-passed via existing drainage routes. The

analyzed area is located in the southern-most portion of the Drainage Basin A, closest to the City of Cle Elum, and limited to the proposed City Heights Planned Mixed-Use Development. Run-off from this basin contributes to the headwaters of Crystal Creek to the southwest.

Basin B. Drainage Basin B is located east of Drainage Basin A, and consists of 379.44 acres of mixed forest land and pasture, with forest land being the predominant land use. Similar to Drainage Basin A, Drainage Basin B is underlain with ashy and Teanaway loam soils. Only 57.53 acres of this basin is considered in the analysis, as the rest of the area will be by-passed via existing drainage routes. The analyzed area is located in the southern-most portion of Drainage Basin B, closest to the City of Cle Elum, and limited to the proposed City Heights Planned Mixed-Use Development. Run-off from this basin enters the City of Cle Elum storm drainage system to the south.

Basin C. Drainage Basin C is located east of Drainage Basin B, and consists of 1,174.10 acres of mixed forest land and pasture, with forest land being the predominant factor. Similar to Drainage Basins A and B, Drainage Basin C is underlain with ashy and Teanaway loam soils. Only 179.76 acres of this basin is considered in the analysis, as the rest of the area will be by-passed via existing drainage routes. The analyzed area is located in the southern-most portion of Drainage Basin C, closest to the City of Cle Elum, and limited to the proposed City Heights Planned Mixed-Use Development. Run-off from this basin enters the City of Cle Elum storm drainage system to the south.

Basin D. Drainage Basin D is located east of Drainage Basin C, and consists of 317.75 acres of mixed forest land and pasture, with pasture being the predominant factor. Drainage Basin D is underlain with Teanaway loam soils. Only 29.78 acres of this basin is considered in the analysis, as the rest of the area will be by-passed via existing drainage routes. The analyzed area is located in the southern-most portion of Drainage Basin C, closest to the City of Cle Elum, and is limited to the proposed City Heights Planned Mixed-Use Development. Run-off from this basin enters the City of Cle Elum storm drainage system to the south.

Insert Figure 3.18.3-1. Existing Drainage Basin Map

(11 x 17-inch black-and-white)

Basin E. Drainage Basin D is located east of the southeast portion of Drainage Basin D, and consists of 83.51 acres of pasture land. Similar to Drainage Basin D, Drainage Basin E is underlain with Teanaway loam soils. Only 6.29 acres of this basin is considered in the analysis, as the rest of the area will be by-passed via existing routes patterns. The analyzed area is located in the southern-most portion of Drainage Basin C, closest to the City of Cle Elum, and is limited to the proposed City Heights Planned Mixed-Use Development. Run-off from this basin enters the City of Cle Elum storm drainage system to the south.

Large portions of each drainage basin are located upstream of the City Heights project site. These upstream basins are not considered in the hydrologic analysis, as they will be by-passed via existing drainage routes that dissect the project site. On an overall scale, the upstream basins discharge directly to these existing drainage routes. Only small portions of the upstream basins, located along the northern property line, may sheet-flow onto the project site. These amounts would not adversely affect this analysis and could be either included in the final storm drainage calculations/analysis or by-passed via proposed rock-lined swales along the northern property line.

A preliminary downstream analysis of the project site was performed by Encompass Engineering & Surveying. The results of this analysis are summarized below. Detailed descriptions of each downstream basin from the City Height's property to the Yakima River are provided in the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010). The bullet list below describes the downstream path to the Yakima River from the City Heights site:

- West Basin is the western most downstream basin that drains directly into Crystal Creek.
- Summit View Basin begins at Summit View Road and heads southwest across private property and into Crystal Creek.
- Sixth Street Basin begins on Sixth Street near the City of Cle Elum water tanks and heads west, then south and into Crystal Creek.
- Peoh Basin begins at the north end of Peoh Street and heads south into the City's Second Street stormwater conveyance system.
- Montgomery Basin begins at Montgomery Avenue and heads southeast across private lands and into the City's Second Street stormwater conveyance system.
- Columbia Basin begins at the extension of Columbia Avenue (also known as Creekside Road) and heads south into the City's Second Street stormwater conveyance system.

Crystal Creek

Crystal Creek is identified as a Category 4A Water just north (upstream) of the most western end of the City Heights project site, based on the Department of Ecology (Ecology) Water Quality Assessment 303(d) list for the State of Washington. Ecology studies have determined that pollutants such as fecal coliform, dissolved oxygen, chlorine, and ammonia are present in Crystal Creek. Ecology has therefore issued, and the U.S. Environmental Protection Agency (EPA) has approved, Total Maximum Daily Load (TMDL) criteria for Crystal Creek. Appendix B of the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010) provides additional information on the Washington State 303(d) list and TMDL criteria.

Streams that flow through the site are described in Draft EIS Section 3.4.2.

Hydrologic Characteristics

The entire City of Cle Elum and its Urban Growth Area are acknowledged as being located within a highly erosive area susceptible to frequent flooding. Many flooding events have occurred in recent years resulting from poorly maintained and deteriorated drainage patterns and undersized storm drainage systems. Existing on-site roads and a few associated culverts, as well as the culverts and storm drainage infrastructure located downstream of the project site, result in surface water runoff problems at the present time due to conditions of deterioration, improper installation, lack of maintenance, and under-sizing.

Runoff modeling for the proposed City Heights Planned Mixed-Use Development was done using the Santa Barbara Urban Hydrograph method version 4.21B accepted by Ecology as a proper simulation modeling program. As required by Ecology's 2004 *Stormwater Management Manual for Eastern Washington* (SWMMEW), the runoff analysis is performed for the 2-year and 25-year events. Due to existing flooding issues downstream of the project site, the 100-year storm event was also analyzed.

It is assumed that most of the 36 inches of average annual precipitation that falls on the project site is currently conveyed as seasonal temporary surface water in local streams and drainage courses, while some is lost to infiltration and evapotranspiration (i.e., the uptake and release of water through plants). In the Cle Elum area, groundwater generally occurs in two primary hydrogeologic units: unconsolidated alluvial and glacial sediments, and fractured bedrock. It is expected that groundwater flows generally south through the project site, discharging to the unconsolidated deposits in the Yakima River valley and ultimately to the Yakima River. Groundwater flow through bedrock likely occurs primarily through interconnected fractures and joints, with only minor flow occurring through the rock matrix.

Stormwater infiltration rates are primarily controlled by the permeability properties of near-surface soils and the depth to hydraulic barriers such as impermeable layers (like bedrock) and the groundwater table. Soils mapped by the Natural Resources Conservation Service (NRCS) indicate that the permeability of most natural soils on the project site is moderate to high. Glacial deposits and residuum units likely facilitate relatively high infiltration rates. Areas of shallow bedrock and shallow groundwater limit deep infiltration.

The drainage analysis prepared by Encompass Engineering & Surveying, performed with King County Hydrograph Program software, classifies the site soil conditions by Hydrologic Soil Group as "C" – Moderately High Runoff Potential, and "D" – High Runoff Potential. Even though permeability in some soils on the project site may be considered moderate to high and could therefore accommodate infiltration of stormwater and reduce the size of the detention pond, the stormwater infiltration analysis has not been performed or factored into the calculations of pond size. Infiltration capabilities of the project site soils will be further investigated prior to the design phase, and infiltration for stormwater will be considered during that time when determining detention requirements.

POTENTIAL IMPACTS DURING CONSTRUCTION

Construction stormwater impacts associated with site development would be largely related to the potential for wind and water erosion of disturbed and exposed soils during earthwork activities such as trenching and pipe installation; excavation and grading for detention/retention/infiltration and drainage conveyance facilities; and other construction activities described in Draft EIS Chapter 2, Section 2.8.

Sediment-laden water from exposed soils within City Heights could enter seasonal stream courses through the site and Crystal Creek, unless proper protective measures are implemented during construction. Proposed measures are described below.

Temporary erosion/sedimentation control (TESC) facilities will be installed on the City Heights site during construction in accordance with local regulations and the Washington Department of Ecology 2004 *Stormwater Management Manual for Eastern Washington* (SWMMEW). ESC measures will minimize soil erosion once the natural vegetative cover has been removed, and will minimize the occurrence of sediment from those same areas migrating into water bodies (streams and wetlands). Construction Best Management Practices (BMPs) will be implemented to convey, collect, treat and control the release of construction stormwater runoff. Representative measures include: installing fencing to delineate the limits of work/construction zones, utilizing vegetated or rip-rapped roadside ditches and check dams for conveyance, creating sedimentation ponds and/or sediment traps for collection and treatment of stormwater runoff prior to release from the site, installing silt fences or straw wattles for treatment, and installing proper piping and outfall protection inside the limit of work areas for controlled release of construction stormwater runoff.

Prior to any on-site construction activity, a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit will be obtained from Ecology. This permit will notify the appropriate regulatory agencies of construction activities that have the potential to discharge sediment-laden water to waters of the State, and will include conditions to be implemented to avoid or minimize construction stormwater impacts. Representatives of agencies with jurisdiction may inspect the site during construction to ensure that effective ESC measures are in-place.

Also before construction is permitted, Stormwater Pollution Prevention Plans (SWPPPs) will be prepared to provide guidance to contractors regarding how to deal with varying degrees and types of runoff problems to prevent sediment-laden water and wind-blown particles from leaving the target area, as well as how to manage accidental spills in the event that this were to occur. The target area would be the specific area under construction at any given time; therefore, multiple SWPPPs will be prepared over time as the site is developed. The SWPPPs will also address protection of adjoining properties (such as developed sites, wetlands, steep slopes, and drainage courses) from areas undergoing development on the site, or areas being used to support construction, including but not limited to vehicle staging areas and stockpile areas.

Snowfall that occurs in the Cle Elum area between approximately late fall and late spring each year will limit ground-disturbing activities to the drier months of the year. The actual months of construction activity may vary from year to year depending on when snowfall occurs.

Under the No Action Alternative, the City Heights site would remain undeveloped and therefore would not require stormwater management facilities. The natural depressions, vegetation, and hydrologically-rough landscape of the site at the present time allows large amounts of the on-site precipitation to infiltrate, evaporate or be transpired by existing vegetation.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Developed-Condition Stormwater Quantity Control

Development of the project site would introduce a large amount of impervious surface area (structures, roads and parking areas) and decrease the amount of pervious area (forest, shrub and meadows), thereby increasing the amount of surface water runoff. Existing drainage facilities downstream from the project site do not have enough capacity to convey increased volumes of runoff, with the result that downstream flooding conditions could become worse (if uncontrolled). If surface water runoff from the site were not treated prior to release, this runoff could convey pollutants to receiving waters in the form of petroleum product residues and heavy metals associated with the operation of motor vehicles on the site; sediments, pesticides, fertilizers and pet wastes from landscaped areas. The proposal includes

complying with all applicable regulations to construct and maintain a stormwater management system that would avoid or minimize these potential effects.

The developed-condition stormwater management system would include drainage conveyance systems properly designed and constructed in accordance with Ecology's 2004 *Stormwater Management Manual for Eastern Washington* (SWMMEW), including a stormwater collection and conveyance system, catch basins equipped with sediment filters, vegetative and/or rip-rapped swales and check dams, detention/retention facilities, control structures equipped with oil-water separators, infiltration facilities (if groundwater levels allow), properly-sized culverts at stream crossings designed and constructed in accordance with Washington Department of Fish and Wildlife (WDFW) Hydraulic Code Rules, and proper outfall/runoff discharge protection and energy dissipation.

To protect stream morphology, detention facilities are proposed throughout the project site, based on separate basin areas, to detain the post-development runoff associated with proposed site improvements. Table 3.18.3-1 shows the approximate post-development impervious areas of the four conceptual land use alternatives. Final site design will identify smaller sub-basins, including off-site areas. For the purpose of estimating impacts, these calculations are based on approximate typical land cover as determined by the project proponent, the *Geotechnical Evaluation* prepared for the project (Aspect Consulting, October 2009), and State and local standards.

Table 3.18.3-1. Projected impervious cover with the City Heights conceptual land use alternatives.

Basin	**Total Area (acres)**	**Projected Impervious Cover (in acres)**		
		Alternative 1 (Preferred)	**Alternative 2 or 3A**	**Alternative 3B**
A	84.64	33.28	30.41	71.60
B	57.53	17.11	15.77	
C	179.76	55.61	50.84	
D	29.78	10.67	9.95	
E	6.29	2.80	2.5	
Total	**358.00**	**119.47**	**109.47**	**71.60**

Where development patterns and topography allow, small localized drainage facilities would be provided rather than fewer large facilities with large conveyance networks. This "low impact development" approach to stormwater management will be utilized in order to more closely mimic the pre-development hydrology of the site. Techniques that retain natural land cover, minimize impervious surfaces, and maximize infiltration of stormwater will be used to the extent practicable.

Drainage calculations were performed for each basin to determine both the total stormwater runoff for the pre-development and the post-development condition, and the required stormwater facility detention volume. Infiltration analysis will be performed in the design phase of the project. However, it was confirmed that adequate stormwater management improvements can be located on the project site (Encompass Engineering & Surveying 2010). This analysis assumes no infiltration for a conservative approach. The results of these calculations are shown below in Tables 3.18.3-2 and 3.18.3-3. While large detention facilities will most likely not be used as the primary means of stormwater management within the development, the analysis of the area required for these types of facilities is easier to quantify and gives a general analysis of stormwater detention requirements for a specific basin. During detailed design,

sub-basins within these larger basins will dictate the number and actual size of stormwater quantity control facilities required.

Table 3.18.3-2. Estimated unmitigated stormwater runoff from each City Heights conceptual land use alternative.

Basin	Estimated Unmitigated Stormwater Runoff 100-Year Event (in cubic feet per second)[a]				
	Alternative 1 (Preferred) [a]	Alternative 2 or 3A[b]	Alternative 3B[b]		No Action[c]
A	94.77 cfs	93.26 cfs	**Proposed**	**Existing**	71.81 cfs
B	61.51 cfs	60.80 cfs	373.55 cfs	289.38 cfs	52.49 cfs
C	197.31 cfs	194.94 cfs			150.58 cfs
D	34.02 cfs	33.69 cfs			29.08 cfs
E	7.33 cfs	7.18 cfs			6.14 cfs
Total	**394.94 cfs**	**389.87 cfs**	**373.55 cfs**	**289.38 cfs**	**310.10 cfs**

[a] Refer to Appendix D of the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010) for detailed calculations for this and other storm events.
[b] Post-Development Runoff for the 100-year storm event for the site as a whole, analyzed as a single basin before the 17-parcel conceptual land use plan for Alternative 3B was prepared. The developed condition within each basin is the most uncertain for this alternative at the current conceptual level of land use planning.
[c] Pre-Development Runoff (i.e., existing conditions) for shown storm event.

Table 3.18.3-3. Estimated required detention volume by City Heights conceptual land use alternative.

Basin	Total Area (in acres)	Estimated Required Detention Volume (in cubic feet) [a,b]		
		Alternative 1	Alternative 2 or 3A	Alternative 3B
A	84.64	246,901 cf	222,531 cf	756,831 cf
B	57.53	114,550 cf	102,654 cf	
C	179.76	321,144 cf	314,573 cf	
D	29.78	66,742 cf	66,643 cf	
E	6.29	14,525 cf	14,314 cf	
Total	**358.00**	**763,862 cf**	**720,715 cf**	**756,831 cf**

[a] Refer to Appendix D of the *Grading, Drainage and Utilities Technical Engineering Report* (Encompass Engineering & Surveying 2010) for detailed calculations for this and other storm events.
[b] Volumes shown are for the 100-year storm event.

Developed-Condition Stormwater Quality Control

Ecology's 2004 *Stormwater Management Manual for Eastern Washington* (SWMMEW) requires stormwater quality treatment measures to reduce pollutant loads and concentrations in stormwater runoff

using physical, biological, and chemical removal mechanisms for the protection of water quality and beneficial uses of receiving waters. The most effective basic treatment Best Management Practices (BMPs) remove about 80 percent of total suspended solids from treated runoff, and a much smaller percentage of dissolved pollutants. It may be necessary to provide additional treatment to remove oil residues, metals, and/or phosphorus from stormwater runoff in the completed condition of the project.

Water quality treatment facilities are selected based on the types of treatment required, terrain configuration, and site layout. Based on these characteristics of the City Heights Planned Mixed-Use Development, Biofiltration Treatment Facilities are the primary means selected for stormwater quality treatment.

The preliminary engineering analysis indicates that the entire basin area runoff would require treatment measures in the developed condition of the site for any conceptual land use alternative selected for implementation. Single facility sizes for water quality treatment offer a convenient method for comparing differences between the alternatives in Table 3.18.3-4 below; however in practice, multiple smaller facilities would be implemented across the on-site drainage basins. Pre-treatment facilities sizing will also be determined in the design phase of the project based on the water quality design flow rate.

Table 3.18.3-4. Estimated required runoff volume for water quality treatment by City Heights conceptual land use alternative.

Basin	**Total Area (acres)**	**Estimated Required Volume for water quality treatment (in cubic feet)**[a]		
		Alternative 1	Alternative 2 or 3A	Alternative 3B
A	84.64	131,248 cf	119,797 cf	419,479 cf
B	57.53	74,172 cf	74,172 cf	
C	179.76	254,427 cf	254,427 cf	
D	29.78	46,179 cf	46,179 cf	
E	6.29	10,667 cf	10,667 cf	
Total	**358.00**	**516,693 cf**	**505,242 cf**	**419,479 cf**

[a] Volume for water quality treatment based on 0.5 inch of runoff over the impervious surface approach.

Impacts from any of the four conceptual land use alternatives would be similar in nature, as summarized in Tables 3.18.3-2 through 3.18.3-4. These tables show that there would be approximately a 2 percent difference in volume of runoff generated from full build-out of the alternatives, approximately a 3 percent difference in detention volume required, and less than 9 percent difference in required water quality treatment volume.

There would be no alteration of stormwater runoff, infiltration, evaporation or transpiration if no development activity took place on the project site under the No Action Alternative (Alternative 4). However, the risk of existing downstream flooding problems would continue if the No Action alternative were selected.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. The City Heights proposal would comply with the requirements of Ecology's 2004 *Stormwater Management Manual for Eastern*

Washington (SWMMEW) to mitigate the potential impacts of surface water runoff described above. Temporary erosion/sedimentation control (ESC) facilities would be installed during construction. ESC measures would minimize soil erosion once the natural vegetative cover has been removed, and would minimize the occurrence of sediment from those same areas migrating into water bodies such as streams. Permanent stormwater management facilities would be created concurrent with residential and commercial development on the site, and technologies associated with sustainable designs would be implemented. Possible treatment methods to accomplish this goal are described below.

Based on the proposed design criteria and mitigation measures for stormwater management, it is anticipated that the City Heights project would not adversely affect the existing water quality of Crystal Creek during construction or in the completed condition of the development.

Flow control and channel stabilization measures will be implemented throughout the project site in compliance with Ecology's 2004 SWMMEW standards, especially near existing critical areas such as wetlands and streams (such as Stream D), to minimize both existing conditions of erosion and sediment transport and conditions that have the potential to be made worse as a result of site development. Representative Best Management Practices are listed below:

- BMP C102: Buffer Zones
- BMP C120: Temporary and Permanent Seeding
- BMP C122: Nets and Blankets
- BMP C124: Sodding
- BMP C200: Interceptor Dike and Swales
- BMP C202: Channel Lining
- BMP C207: Check Dams
- BMP C209: Outlet Protection
- BMP C234: Vegetated Strip
- BMP C235: Straw Wattles
- BMP F6.10: Detention Ponds
- BMP F6.21: Infiltration Ponds
- BMP F6.42: Full Dispersion
- BMP T5.10: Infiltration Ponds
- BMP T5.40: Biofiltration Swales
- BMP T5.50: Vegetated Filter Strip

Given that seasonal flooding occurs in the Crystal Creek basin and in seasonal streams that flow through the City Heights site under existing conditions, mitigation measures may be selected from the following strategies to address the increased volume of stormwater and increased peak flows that would occur as a result of the City Heights Planned Mixed-Use development:

- Reduce the quantity of stormwater to be discharged.
- Implement full or basic dispersion for each phase of development based on the King County 2009 *Surface Water Design Manual* in order to reduce, treat and/or slow down post-development runoff.

- Where possible, infiltrate stormwater in an area where recharge does not report directly to basins that have flooding problems.
- Store stormwater during the wet season for use during the dry season and/or until the timing of recharge will have a minimal impact on these basins.
- Improve and/or maintain the capacity of the City's stormwater conveyance infrastructure so that it can handle increased flows without an increase in flooding.
- Develop on-site snow removal policies that will allow snow runoff to be properly detained and not by-pass the stormwater management system.

It is anticipated that some form of low impact development approach to stormwater management may be used depending on the conceptual land use alternative selected for implementation. Low impact development methods differ from traditional development in that they are applied at a smaller scale and are designed to more closely mimic pre-development hydrology by managing stormwater closer to its source in small drainage areas, rather than creating large stormwater facilities for entire drainage basins.

Stormwater management facilities within the City Heights development would be owned and maintained by the Homeowners' Association (HOA) after construction is complete and lots are legally platted. Prior to that time, the property owner/developer would be responsible for maintenance of these facilities. Each stormwater management facility would need to be periodically observed and maintained to ensure design performance. The HOA would need to create a procedure for this observation and maintenance.

Applicable Regulations. The Washington Department of Ecology (Ecology) 2004 *Stormwater Management Manual for Eastern Washington* (SWMWW) will be used for initial design guidance at the beginning of the proposed development as it includes the latest technology and best available science. If more current local and State manuals for guidance on stormwater management design are adopted by the City of Cle Elum (if Alternative 1 or 2 is selected), Kittitas County (if Alternative 3A or 3B is selected), and/or the Washington Department of Ecology, these will be followed at the time of each site development application.

Prior to any construction activity on site, a National Pollutant Discharge Elimination System (NPDES) Construction Stormwater Permit will be obtained from Ecology and Stormwater Pollution Prevention Plans (SWPPP) will be prepared.

Mitigation measures related to potential developed-condition impacts will comply with Ecology's 2004 SWMMEW in regards to the hydrologic analysis of pre-development and post-development conditions, quantity and quality control, and conveyance design; City of Cle Elum or Kittitas County standards (depending on the alternative selected for implementation) for underground drainage conveyance systems; U.S. Army Corps of Engineers Section 404 permit requirements (if applicable), and Washington State of Fish and Wildlife Hydraulic Project Approval (HPA) requirements for culvert design and installation or any work within existing creeks (especially Crystal Creek and Stream C).

Other Recommended Mitigation Measures. Site development options that retain natural land cover, minimize impervious surfaces, and maximize infiltration of stormwater should be used as to the extent practicable on the City Heights project site.

Other possible mitigation measures, not under the control of the project proponent, include:

- Regional cooperation to design and construct improvements to existing drainage conveyance facilities in terms of replacement, upgrade, repair and/or maintenance located downstream of the project site, including but not limited to City of Cle Elum stormwater conveyance infrastructure.
- Formulation of City-wide snow removal policies that will allow snow runoff to be properly detained and not by-pass the stormwater system.
- The City of Cle Elum could, in the future, provide a comprehensive stormwater management plan in order to construct, operate and maintain a regional stormwater management facility. No such plan currently exists.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Given that the proposal will comply with all applicable stormwater management regulations during construction and in the developed condition of the site, no significant unavoidable adverse storm drainage impacts would be anticipated. Further, while Ecology's SWMMEW requires detaining the 25-year storm event, the proposal includes detaining the 100-year storm event based upon past flooding experiences in the area. Stormwater runoff effects from the site as a result of a storm and/or flood event of greater magnitude than the 100-year storm event would be considered a significant unavoidable adverse impact.

3.18.4 Electrical Service

Puget Sound Energy (PSE) and the Kittitas County Public Utility District (PUD) are the two electrical service providers within the Cle Elum area. Information provided in this section is derived from personal communications received from David Bowen, PSE Municipal Liaison Manager (July 17 and October 16, 2009); Laurie Scott, PSE Engineering Specialist, Customer Construction Services (October 30, 2009); Sandy Leek, PSE Municipal Liaison Manager – Special Projects (November 9, 2009); and from Matt Boast, Kittitas County PUD System Engineer (August 24, 2009).

AFFECTED ENVIRONMENT

The PSE service territory includes eleven Washington Counties throughout the Puget Sound area and Kittitas County. The company's service territory within Kittitas County includes all unincorporated and incorporated areas except the City of Ellensburg. Therefore, the City of Cle Elum and the City Heights site are presently within the PSE service area. PSE has three existing electrical substations in the Cle Elum area: the Cle Elum Substation, Cascade Substation, and Thrall Substation. The company makes on-going reliability upgrades to their infrastructure throughout the area.

Two major electrical transmission lines pass through the City Heights property at the present time: PSE's Rocky Reach/Cascade 230 kilovolt (kV) line, and the Bonneville Power Administration's (BPA) Rocky Reach-Maple Valley 345 kV line. Both are important cross-Cascade Mountain transmission lines. The combined width of the side-by-side easements in which these transmission lines are located is 285 feet. The total land area of the City Heights property occupied by these easements is ±68 acres. The easements/rights-of-way were granted to Puget Sound Energy and the United States of America by original property owners (Northwest Improvement Company [1941], Northern Pacific Railway Company [1957], and Plum Creek Timber Company [1986]), and run with the land. The property owner is the grantor of the easements that allow PSE and BPA to construct, operate, patrol, maintain, repair, replace, and enlarge one or more electric transmission and/or distribution lines together with all necessary or convenient appurtenances thereto. PSE is allowed to construct additional lines or facilities as it may require within the designated area of the easement. The terms of the easement reserve the right of the grantor (the property owner) to cross and re-cross the right-of-way at any point and to use the right-of-

way for the purpose of constructing, operating, and maintaining communication lines, pipelines, conduits, and roadways, or "for all other purposes" except that no buildings or structures shall be constructed within the transmission line corridor that would interfere with the operation and maintenance of these lines. Grantee (PSE) has the right to cut and remove or otherwise dispose of any and all brush and trees on the right-of-way, and to control on a continuing basis by any prudent and reasonable means the establishment and growth of trees, brush or other vegetation upon or outside the right-of-way that could pose a hazard to the electrical transmission lines or interfere with PSE's right of access to the transmission line corridor. Prior to removing hazard trees outside the right-of-way, PSE is required to notify the property owner of their location, and to pay the reasonable market value of any merchantable timber that is cut and removed by PSE (Official Records of the Kittitas County Auditor: Volume 64, pages 12−14, May 23, 1941; Volume 101, pages 181−183, September 6, 1957; Volume 243, pages 724−726, April 14, 1986).

PSE is governed by both the Federal Energy Regulatory Commission (FERC) and the North American Electric Reliability Corporation (NERC) regarding allowable uses within power line corridors. The 230 kV transmission line is the highest voltage power line that PSE owns/operates. NERC exclusions include (but are not limited to) any electric facilities (such as sewage lift stations or pump stations), any metal structures, any trees over 15 feet tall, and any non-metallic structures over 15 feet tall.

The Kittitas County PUD service area also includes all of Kittitas County: 2,315 square miles. The PUD currently serves 1,283 customers in the Teanaway and Cle Elum area. The majority of these are residential customers; a few are commercial and seasonal irrigation loads. The PUD has one 8.4 megavolt ampere (MVA) substation (the Teanaway Substation) located 3 miles east of Cle Elum. There are two circuits out of this substation: one that serves the Teanaway Valley/Liberty area (in the SR 970/SR 97 corridor), and one that serves South Cle Elum and the east end of the Cle Elum Heights area. Electrical energy is supplied to this substation at 34 kV by the Bonneville Power Administration via transfer agreement through the PSE distribution system. This substation currently peaks in the winter at nearly 5 megawatts (MW).

Kittitas County PUD completed a load forecast in April 2008. The average annual increase in projected load for future years is 2.4 percent. Adjustments are included for housing projects, new commercial or industrial loads, City and County planning. This load growth estimate is based on the history of load growth within the PUD's service area. To meet projected capacity demands, the Kittitas County PUD #1 *2009−2024 System Planning Study* (November 2008) identifies options for substation upgrades or a new substation to serve the Cle Elum area before 2019. The *Planning Study* identifies expanding the Teanaway Substation by 2018.

PSE and the Kittitas County PUD compete for the opportunity to provide electrical services within the County, subject to Washington State bid laws. The company with the closest power lines generally has an advantage in extending lines to serve new customers. PSE presently serves the majority of the Cle Elum area; however, the PUD may establish a main feeder route through town to better serve existing and future loads (personal communication with Matt Boast, Kittitas County PUD System Engineer, August 24, 2009).

POTENTIAL IMPACTS DURING CONSTRUCTION

Either electrical service provider would need 5 to 10-foot wide easements within the City Heights development for the extension of power lines to serve the project, unless these corridors could be located within public rights-of-way (such as City streets, if the City accepts ownership and maintenance responsibility for streets within City Heights). Both PSE and the PUD hold franchise agreements with the City and County to install and maintain power lines in this area. PSE also has franchise agreements with

the City and County for the provision of natural gas service. The PUD would prefer overhead main feeders in the utility corridors (underground is possible at higher cost), and overhead or underground installations for all taps off the main feeder line(s). Joint use of trenches with other utility providers is acceptable, with 12 inches of vertical and horizontal separation.

The electrical service requirements of the City Heights development will be coordinated with the Engineering and Construction Departments of the selected service provider during the preparation of construction documents for the project. The developer will continually coordinate with the electrical utility company on long-range planning/scheduling needs, but the actual design of facilities will occur as subdivision applications are submitted to the City of Cle Elum for each phase of development.

To the extent that project roads, utilities, and trail improvements will be made within the PSE and BPA easements for the overhead electrical power transmission lines, this work will also be coordinated with these utility service providers.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Puget Sound Energy (PSE) would anticipate serving the City Heights project from three access points along Third Street: Billings Avenue, Montgomery Avenue, and Columbia Avenue. Some distribution line improvements would be required, as well as space required for two pad-mounted 34-12 kV step-down transformers. If most customers would be connected to natural gas for heating and hot water, the impact of any of the conceptual land use alternatives on the PSE electrical service system would be fairly minor. On the other hand, if most of the residential customers would use electricity for heat and hot water (rather than natural gas), the demand for electrical service would be higher, and PSE would need to review load requirements in more detail.

The Kittitas County PUD estimate of the electrical demand of the City Heights Planned Mixed-Use development is based on a 60 percent diversity factor to account for loads peaking at different times. The diversity factor is also based on an assumption that some homes would use natural gas for heat and hot water, and some homes would be all-electric. Table 3.18.4-1 shows the electrical demand estimate for each of the City Heights conceptual land use alternatives. Alternative 1 would exert a higher demand for electricity than the reduced residential density alternatives (Alternative 2 or 3A) due to the larger number of dwelling units in this alternative. If all dwelling units and neighborhood businesses within the project were served with natural gas for heat and hot water, the electrical demand estimates shown in Table 3.18.4-1 would be lower.

Table 3.18.4-1. Electrical demand projections for the City Heights conceptual land use alternatives.

	Single-Family Detached Homes @ 5.5kW/unit	**Attached Dwelling Units @ 3 kW/unit**	**Neighborhood Commercial Development @ 20 W/sf[1]**	**Total Estimated Electrical Demand for each Alternative**
Alternative 1	690 sfd / 3,795 kW	295 du / 885 kW	20,000 sf / 400 kW	5,080 kW
Alternative 2	525 sfd / 2,888 kW	350 du / 1,050 kW	40,000 sf /800 kW	4,728 kW
Alternative 3A	525 sfd / 2,888 kW	350 du / 1,050 kW	40,000 sf /800 kW	4,728 kW
Alternative 3B	500 sfd / 2,750 kW	0	0	2,750 kW

[1] Actual commercial load will depend on the nature of the businesses that occupy the neighborhood commercial space within the development.

Density and projected load will determine the feasibility of the project for the electrical service provider. In general, a greater load density will yield better revenue for the utility, and therefore increase the chance of PUD or PSE investment in the developing area. Differences in jurisdiction between Alternative 1 or 2 (to be developed within the City of Cle Elum), or Alternative 3A or 3B (to be developed within the unincorporated area of Kittitas County) would be inconsequential to the provision of electrical service by either PSE or the PUD. If the No Action Alternative were selected (Alternative 4), neither PSE nor Kittitas County PUD would extend service to the City Heights site, and it would continue to be less efficient for the PUD to provide electrical service within the Cle Elum service area.

If Kittitas County PUD is selected to provide service to the City Heights development, they would need to expand the Teanaway Substation sooner than presently scheduled (2018), or find a property and tap location near existing electrical transmission lines to meet the demands of this project if development progresses at the rate forecast within a 6 to 12-year timeframe.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. The City Heights developer will coordinate with PSE and BPA concerning the construction, operation, and maintenance of roads, utilities, and/or trail improvements within the easements granted to PSE and BPA for the overhead electrical transmission lines that pass through the property.

It is the preference of the project proponent to have natural gas service installed throughout the development to serve all homes and neighborhood commercial uses, provided that it is cost-effective to do so.

The developer will encourage builders to incorporate "built green" features and additional energy conservation measures to the extent practicable.

Applicable Regulations. Any activity proposed within the PSE easement would be submitted to three PSE departments (Engineering, Total Energy System Planning, and Electric First Response) for review before the work takes place. Information required by PSE will include: a letter from the project proponent specifying the need for work within the PSE easement, a narrative description and drawing of the proposed activity within the easement area, a completed application form, and a check (payable to Puget Sound Energy) to cover the administrative fee for review. Similarly, activity proposed within the BPA easement would be coordinated with all required departments within this agency.

Washington Utility and Transportation Commission (WUTC) tariffs will specify cost responsibility for electrical and natural gas line extensions, some portion of which may be a developer expense. Cost will be a factor in determining whether electrical power will be installed underground or using overhead transmission lines.

Other Recommended Mitigation Measures. It would be helpful to Kittitas County PUD (if selected as the electrical service provider) for some property to be set aside or zoned for an electrical substation or electrical switchyard within the Cle Elum service area.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Construction and occupancy of the City Heights development would result in the consumption of a significant amount of electrical energy; however, this demand would occur regardless of where within the City of Cle Elum and/or Kittitas County development occurs to provide for projected population growth during the current 20-year planning period. The vast majority of electrical energy conveyed by PSE

originates from hydropower, a renewable source. Based on communications with PSE and Kittitas County PUD, neither utility would anticipate significant unavoidable adverse impacts to their ability to provide electrical service in the Cle Elum area as a result of phased development of the City Heights project.

3.18.5 Natural Gas Service

Puget Sound Energy (PSE) is the natural gas service provider within the Cle Elum area. Information provided in this section is derived from personal communications received from David Bowen, PSE Municipal Liaison Manager (July 17 and October 16, 2009).

AFFECTED ENVIRONMENT

Supply mains ranging in size from 4 to 16 inches in diameter transport natural gas from gate stations to district regulators. District regulators reduce supply main pressures to typical distribution operating pressures of 25 to 60 pounds per square inch gauge (psig). Distribution mains are fed from the district regulators. These mains typically range in size from 1¼-inch to 8 inches in diameter. Pipe material is typically polyethylene (PE) or wrapped steel (STW). Individual residential service lines are fed by distribution mains, typically 5/8-inch diameter. Individual commercial service lines are typically 1¼ to 2 inches in diameter.

PSE has no specific system improvement projects planned for 2010 for the natural gas distribution system within the Cle Elum City limits. Tentative future projects include installing a new district regulator at approximately N. Wright Avenue and E. Railroad Street. Due to the growing popularity of natural gas in the City of Cle Elum and surrounding areas, PSE continually evaluates the need for system improvement projects and alternatives for serving the Cle Elum area. The company's plans are dependent on system needs, budgets, and Washington Utilities and Transportation Commission (WUTC) approval.

POTENTIAL IMPACTS DURING CONSTRUCTION

The provision of natural gas service to the City Heights Planned Mixed-Use development would be coordinated with PSE Engineering and Construction Departments during construction document preparation. The developer would maintain on-going coordination with PSE on long-range planning and scheduling needs. Phased extension of the natural gas system through the City Heights site (if requested by the developer) may or may not coincide with phased development of the project. PSE would make cost-effective and system operational decisions for its own construction project. Load analyses will be prepared at the time of application for each subdivision approval. Natural gas lines extended through the site would be located within public rights-of-way or designated utility easements, with ease of access for inspection and repair.

Puget Sound Energy (PSE) would likely extend natural gas service to the City Heights project from the same three access points along Third Street as those identified for electrical service extension: Billings Avenue, Montgomery Avenue, and Columbia Avenue. New construction would be required to install distribution mains, residential and commercial service lines to extend natural gas service throughout the City Heights development under any conceptual land use alternative in which this service is requested.

If the No Action Alternative were selected, there would be no anticipated utility trenching within the boundaries of the City Heights site to extend the natural gas system onto the property.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Natural gas load demand factors provided by the Bellevue office of PSE in April 2008 were used to estimate the total demand of each of the City Heights conceptual land use alternatives (see Table 3.18.5-1). An average house (using natural gas for both heat and hot water) uses about 1,000 Therms of natural gas per year; 1 (one) Therm is equivalent to about 100 cubic feet (cf) of gas; so 1,000 Therms is about 100,000 cubic feet of natural gas per household per year. For the purpose of the analysis in Table 3.18.5-1, no distinction was made between single-family detached homes and attached dwelling units (du), and no reduction is made for units that may be only seasonally occupied; therefore, this estimate is conservatively high.

For retail and office uses, PSE estimates natural gas load requirements based on the following:

- Retail: 75 ft^3/sq ft/year (75 cubic feet per square foot of floor area per year)
- Office: 85 ft^3/sq ft/year (85 cubic feet per square foot of floor area per year).

For the purpose of the impact analysis, the *Cle Elum City Heights Fiscal Analysis* (Property Counselors 2010) assumes that the neighborhood commercial uses proposed within the conceptual land use alternatives will be comprised of convenience retail uses and professional offices. The natural gas load projection in Table 3.18.5-1 assumes that the mix of convenience retail and professional office would be approximately equal in Alternative 1 (10,000 sf each), or predominantly office use in Alternative 2 or 3A (10,000 sf retail, 30,000 sf office).

Table 3.18.5-1. Natural gas load demand estimate for the City Heights conceptual land use alternatives.

	Residential Demand @ 100,000 cf/du/yr	**Convenience Retail Demand @ 75 cf/sq ft/yr**	**Professional Office Demand @ 85 cf/sq ft/yr**	**Total Natural Gas Load Demand Estimate**
Alternative 1	98.5 million cf/yr	0.75 million cf/yr	0.85 million cf/yr	100.1 million cf/yr
Alternative 2	87.5 million cf/yr	1.5 million cf/yr	1.7 million cf/yr	90.8 million cf/yr
Alternative 3A	87.5 million cf/yr	1.5 million cf/yr	1.7 million cf/yr	90.8 million cf/yr
Alternative 3B	50 million cf/yr	0	0	50 million cf/yr
Alternative 4 (No Action)	0	0	0	0

With 985 dwelling units and 20,000 sf of commercial space (total), the fully built-out and occupied condition of conceptual land use Alternative 1 would generate the highest demand for natural gas, approximately 10 percent higher than Alternative 2 or 3A for which the land use concept includes 875 dwelling units and 40,000 sf of commercial space (total). If Alternative 3B were selected for implementation, and if natural gas service was requested for all 500 single-family detached homes in this alternative, the demand would be approximately half that of the other conceptual land use alternatives due to approximately half the total number of dwelling units and no commercial development within Alternative 3B. Under the No Action Alternative (Alternative 4), there would be no demand for natural gas use on the City Heights site.

Minimum pressure delivery in distribution systems is approximately 15 pounds per square inch gauge (psig). If City Heights growth and increased demand for natural gas service were to cause design pressures to fall below 15 psig, there are several methods by which PSE could increase pressure in the distribution system:

- Loop the distribution and/or supply lines to provide an alternative route for the gas to travel to an area needing additional supply. This method may involve construction of supply mains, distribution mains, and possibly district regulators.
- Install mains parallel to existing mains to supplement the supply of natural gas to a particular service area.
- Replace or upsize existing pipelines to increase volume.

Whether any of these measures would be required in the Cle Elum area as a result of full build-out of City Heights will be determined during phased development of the project. It is highly unlikely that the City Heights development alone would necessitate construction of a new district regulator (personal communication with Laurie Scott, Engineering Specialist, Customer Construction Services; Puget Sound Energy, October 30, 2009).

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. PSE would construct the natural gas system within dedicated rights-of-way using one of its authorized contractors to perform this work. The contractor would be required to work with the City of Cle Elum and/or Kittitas County (depending on the alternative selected for implementation) to provide traffic control measures during work within road rights-of-way adjacent to operational roadways.

Applicable Regulations. Design and construction of all proposed natural gas system improvements would be coordinated with PSE Engineering and Construction Departments.

Other Recommended Mitigation Measures. Measures that could be taken to minimize natural gas demand generally coincide with measures that would increase building envelope insulation and therefore heat loss. Homeowners, commercial property owners and tenants could be encouraged through the Covenants, Conditions and Restrictions (CC&Rs) of the development to utilize energy-efficient practices.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Based on communications with Puget Sound Energy, no significant unavoidable adverse impacts to their natural gas service system would be anticipated with phased development of the City Heights Planned Mixed-Use development.

3.18.6 Telecommunications Service

Qwest, Inland Telephone, and R&R Cable provide telecommunications services within the Cle Elum service area. The information reported below is based on meetings, correspondence, and telephone communications with representatives of each utility (personal communications with Blake Davis, Qwest Manager/Design Engineer, September 30 and October 1, 2009; and Nathan Weis, Vice President, Inland Telephone and R&R Cable, April 8 and November 17, 2009), as well as on-line information available on the websites of these organizations: http://www.qwest.com and http://www.inlandnetworks.com (sites checked October 20, 2009).

AFFECTED ENVIRONMENT

Qwest provides service to the City of Cle Elum, Town of South Cle Elum, and the surrounding community, as well as national and internal service. The "Cle Elum exchange" service area encompasses 135.5 square miles (map on file with the Washington Utility and Transportation Commission).

Qwest provides a full suite of voice, data, and network solutions for residential and business customers. Representative products and services include high-speed internet, digital home phone and long distance telephone service, wireless telephone service, Direct TV service and movies, Wi-Fi network (wireless internet service), automatic on-line back-up, and remote home control.

Anticipated growth rates within Qwest's service territory are estimated using many factors that may differ by individual service types or customer demographics. Some factors used in this process include historical growth rates, identified development proposals, and possible network augmentations. Qwest is responsible to provide services to all areas within their territory based on current rules outlined in the Washington Qwest Communications Exchange and Network Services Catalog No. 2, Item 4.4: Provisioning Agreement for Housing Developments.[6] As new development occurs within Qwest's service territory, the company makes prudent and economic decisions regarding the extension of their telecommunications network, and works with private developers to expand and upgrade the Qwest network as demands for services increase.

Inland Telephone Company offers local telephone service, access to long distance services, call waiting, and call forwarding, three way calling, speed calling and toll denial within a 38 square mile service that that encompasses the City of Cle Elum. A portion of the City Heights site is within this service area; the remainder of the property is within the Qwest franchise service area.

Inland Internet offers dialup, DSL, cable modem and wireless internet along with multiple email accounts if desired. Inland Internet projects a growth rate of 13 percent (235 customers) by 2025, derived from existing and projected population growth identified in the City of Cle Elum Comprehensive Plan (see Draft EIS Section 3.10).

R&R Cable Company offers its customers a total of 130 channels that include basic cable service, enhanced basic cable service, digital converter box, High Definition (HD) with Digital Converter box, HD card. Additional digital converter, HD converter box, and HD card are available. Services also include HD DVR (Digital Video Recorder), 31 HD channels and Premium Movie Channels. R&R Cable projects a growth rate of 37 percent (685 cable customers) by 2025.

Inland Security is also offered in the Cle Elum area.

The near- and long-term plans of Inland Telephone Company and its subsidiaries include the provision of service and expansion of facilities within the Cle Elum area with or without the City Heights development to continue to compete with Qwest and satellite service providers (personal communication with Inland Telephone Company, November 17, 2009).

[6] The Washington Qwest Communications Exchange and Network Services Catalog No. 2 is the detailed tariff on-file with the Washington State Public Utility Commission. This document can be found at: http://tariffs.qwest.com:8000/idc/groups/public/documents/tariff/htmltoc_wa_e_c2.htm.

POTENTIAL IMPACTS DURING CONSTRUCTION

City Heights is presently an unserved property; therefore, the developer can choose which telecommunications service provider they would like to use.

If the project proponent elects to use Qwest telecommunications service, the project proponent/developer will be required to work with the Qwest local engineering office that serves the area to determine the telecommunication needs of the project. This is usually situationally-dependent, and may affect both the anticipated growth of a given area as well as the timing for system augmentations. Qwest has no means to predict the number of potential customers that will choose to install Qwest service at their business or residence; however, the company would design an infrastructure that would have the capacity to serve every customer and a variety of telecommunication needs. The developer would need to provide the local Qwest engineering office with detailed plat designs and a schedule for development. With this information, Qwest could begin the planning and design process. The developer would be required to enter into a contractual agreement with Qwest prior to the construction of any additions to Qwest's network.

If the project proponent/developer chooses to use the services of Inland Telephone and R&R Cable, presumably a similar contractual arrangement and construction coordination would be required.

Telecommunications installation will follow the regulated requirements of each provider. Underground installation may use the same trenches as electrical power installation, and precede the extension of natural gas. This sequencing will require typical coordination between all underground utility service providers. If no separate trenching is required for the installation of telecommunications services, it is unlikely that there would be any distinguishable impacts during construction.

"Bubble easements" (i.e., wider than standard 10-foot easements) may be requested at telecommunications vault locations. In this case, designated sites within the Planned Mixed-Use development would be required to establish small offices (node locations), approximately 20 feet by 20 feet in area, preferably in an easement adjacent to a roadway.

Given the degree of planning and coordination required to augment existing networks to serve a development the size of City Heights, and to design and construct the on-site telecommunications system, it would be much easier and more efficient for the selected service provider to work with one developer under Alternative 1, 2, or 3A. If Alternative 3B were selected for implementation, there would be no coordinated planning or phased provision of service to the site.

If the No Action Alternative were selected, there would be no anticipated utility trenching within the boundaries of the City Heights site to extend underground utilities, including telecommunications services, onto the property.

POTENTIAL DEVELOPED-CONDITION IMPACTS

The character of proposed land use and range in development density between the conceptual land use alternatives (Alternative 1, 2 or 3A) would result in an approximately equivalent demand for telecommunications services, with the greatest potential variable being service to commercial development. The amount and type of retail, restaurant, and/or professional office space would vary by alternative: approximately 20,000 sf total with Alternative 1, to approximately 40,000 sf total with Alternative 2 or 3A. Based on information received to-date regarding the City Heights conceptual land use alternatives, the telecommunications providers have indicated that they have networks with capacity to provide service to the project under any of the build alternatives without adverse impact (personal communication with Blake Davis, Qwest Manager/Design Engineer, September 30, 2009; and Nathan Weis, Vice President, Inland Telephone and R&R Cable, April 8, 2009).

As with Potential Impacts During Construction, the provision of service to Alternative 3B would be the least efficient and the least cost-effective for telecommunications service providers.

If the No Action Alternative were selected, there would be no demand for telecommunications services on the City Heights property in the near-term, and no extension of telecommunications systems to or through the property.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. In order to minimize potential construction conflicts, the developer will contact the selected telecommunications service provider as early as possible following development approvals to initiate engineering design of the system and establish the construction schedule. If Qwest is selected, they usually require a minimum of 60 days to complete a design and release the necessary work orders to their construction department once they have received the plat drawings and power company designs, and enter into a Provisioning Agreement for Housing Developments.

Applicable Regulations. Qwest operates in Washington under a State-wide franchise as designated in the Washington State Constitution. Inland Telephone Company and R&R Cable have a County-wide franchise as well as a franchise with the City of Cle Elum.

Other Recommended Mitigation Measures. Telecommunications design, construction and operation is a routine service for which no additional mitigation measures will be required, other than those specified in the contractual agreement between the developer and the service provider.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

From an operational standpoint, there appear to be no adverse impacts associated with providing telecommunications services to the City Heights development, as the service providers have indicated adequate capacity to handle the development needs and welcome opportunities for expansion (personal communication with Blake Davis, Qwest Manager/Design Engineer, September 30, 2009; and Nathan Weis, Vice President, Inland Telephone and R&R Cable, April 8, 2009).

3.18.7 Solid Waste Collection Service

Solid waste collection, transport and disposal services are provided to the City of Cle Elum by Waste Management of Ellensburg. The company (under various names) has provided this service under a franchise agreement with the City for 25 years or more. The contract is automatically renewed on an annual basis, unless a change is specified in writing by the City. Waste Management of Ellensburg also collects mixed municipal solid waste (MSW) from the unincorporated area in which the majority of the City Heights site is presently located, under agreement/contract with the Washington Utilities and Transportation Commission (WUTC). Personal communication with J.R. Lesure, District Manager, Waste Management of Ellensburg, is the source of information in this section.

AFFECTED ENVIRONMENT

At the time of this writing, Waste Management of Ellensburg had approximately 696 residential customers and 183 commercial accounts within the City of Cle Elum. It is their mission to handle all refuse and recycling needs of customers within their service area. Existing services include the collection of residential and commercial MSW, and cardboard recycling for commercial customers only. The company is open to providing upgrades to their service at the request of the City, such as to offer residential recycling services and yard waste collection (personal communication with J.R. Lesure, District Manager, Waste Management of Ellensburg, October 22, 2009).

Municipal solid waste collected within the City of Cle Elum and adjacent unincorporated area is transported to the Kittitas County Transfer Station, then to the company's East Wenatchee Landfill.

POTENTIAL IMPACTS DURING CONSTRUCTION

If requested by the site developer and/or contractor under any build alternative, Waste Management of Ellensburg can provide containers for construction/demolition/landclearing debris (CDL). Most CDL can be collected without segregating it. This material is transported to the company's processing facility in Woodinville, Washington.

If the No Action Alternative were selected, no CDL would be generated on the site for collection.

POTENTIAL DEVELOPED-CONDITION IMPACTS

Waste Management of Ellensburg learns of new development proposals within their service area through contact and information they receive during environmental review and permitting, and/or directly through new customer calls requesting service. The City Heights proposal under any build alternative is within the range of anticipated growth within the company's service area. While Alternative 1 or 2 would approximately double the number of existing accounts within the City of Cle Elum, the District Manager does not anticipate a need to add manpower or equipment to serve the phased build-out of City Heights, but has the resources available if needed (personal communication with J.R. Lesure, District Manager, Waste Management of Ellensburg, October 22, 2009).

If Alternative 3A or 3B were selected for implementation, Waste Management of Ellensburg would still be the solid waste collection, transport and disposal service provider. The impact on the company's manpower and equipment to serve the development would be approximately the same with Alternative 3A, or approximately half as much with Alternative 3B. The more compact and orderly development under Alternative 1, 2, or 3A would be the most efficient to serve.

If the No Action Alternative were selected, and no development were to occur on the property in the near-term, there would be no change from existing conditions, and thus no requirement for solid waste collection, transport and disposal services associated with the City Heights site.

MITIGATION MEASURES

Mitigation Measures Included in the Development Proposal. The project developer and/or City would notify Waste Management of Ellensburg at the time each new phase of development is proposed within City Heights, in order to coordinate the provision of services that may be required during construction, and to give the company advance notice of the forthcoming increase in the number of customers to be served.

As an alternative to burning land-clearing debris (biomass), the proposal includes grinding wood waste and stumps on-site to create woodchips for use in temporary site stabilization and permanent landscaping. Excess material may also be hauled off-site.

Applicable Regulations. Residential and neighborhood commercial customers would be required to establish individual accounts with the company that has the franchise agreement for solid waste collection services in the Cle Elum area: Waste Management of Ellensburg.

Other Recommended Mitigation Measures. Arranging for the collection of construction/demolition/ landclearing debris during site development would be responsive to the fact that no burning will be allowed on the site. Transport of CDL to the Waste Management processing facility in Woodinville would result in recycling this material to the maximum extent practicable. Trees with rootwads could be made available for stream diversification/habitat enhancement projects if a source is identified to receive this material.

SIGNIFICANT UNAVOIDABLE ADVERSE IMPACTS

Waste Management of Ellensburg does not anticipate any significant unavoidable adverse impacts to their operations as a result of the City Heights development, due to the gradual rate of growth predicted to occur over 6 to 12 years (personal communication with J.R. Lesure, District Manager, Waste Management of Ellensburg, October 22, 2009).