



CITY OF WILDER CITY OF GREENLEAF



PECKHAM ROAD INFRASTRUCTURE STUDY





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INTRODUCTION

This report, the Peckham Road Infrastructure Study, is intended to be utilized as a planning tool for the cities of Wilder and Greenleaf for future development within the Peckham Road Area. Continued coordination between the cities is important for the successful development of this area. Both cities and Canyon County have expressed a desire to create an industrial area, preferably compatible with the surrounding agricultural area. This area will be capable of bringing sustainable jobs to the triangular area bounded by Highways 19, 95, and 20/26, and called the Enterprise Zone.

While this study considers the entire Enterprise Zone for future development, it focused on the Peckham Road Area between Wilder and Greenleaf. The Peckham Road Area, the southwest portion of the Enterprise Zone, is believed to be the most conducive to future growth and will present a guideline for the development of the remainder of the Enterprise Zone.

1. Growth Assumptions

COMPASS started with the following assumptions for the Peckham Road area:

- 1) Existing households in the area: 2,300
- 2) Existing jobs in the area: 1,300

As shown in the chart below titled “Historic Growth Rates”, over the last 50 years, Idaho’s population has grown at an average of 1.6%. Ada and Canyon Counties have grown at an average of 3.0% and 1.8% respectively. In no ten-year period, in the State or either of the two nearby urban Counties, did the growth rate ever exceed 4.4%.

**TABLE 1-1
HISTORIC GROWTH RATES**

| Year | IDAHO | | | ADA COUNTY | | | CANYON COUNTY | | |
|------|------------|-------------|-------|------------|-------------|-------|---------------|-------------|-------|
| | Population | Growth Rate | | Population | Growth Rate | | Population | Growth Rate | |
| | | 10-yr | 50-yr | | 10-yr | 50-yr | | 10-yr | 50-yr |
| 1950 | 588,871 | | 1.6% | 70,649 | | 3.0% | 53,597 | | 1.8% |
| 1960 | 667,191 | 1.2% | | 93,460 | 2.8% | | 57,662 | 0.7% | |
| 1970 | 712,587 | 0.6% | | 112,230 | 1.9% | | 61,288 | 0.6% | |
| 1980 | 943,935 | 2.8% | | 173,036 | 4.4% | | 83,756 | 3.2% | |
| 1990 | 985,259 | 0.4% | | 201,519 | 1.8% | | 87,449 | 0.4% | |
| 2000 | 1,293,953 | 2.8% | | 300,904 | 4.1% | | 131,441 | 4.2% | |

After presenting this information to City of Wilder and Greenleaf representatives, a consensus was achieved that a 3% growth rate would be used for this study, while keeping in mind that a 3% growth rate may be a conservative number over the course of buildout and a 1.5% growth rate may be more realistic over the course of the next century.

After arriving at this growth rate, COMPASS was able to produce some timeframes for expected build-out given

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the five scenarios of development that were examined in this study. These scenarios are titled as:

- Smart Growth
- Commercial/Food Processing
- Commercial/Industrial Food Processing
- Commercial/Industrial
- Sprawl

Each of these development scenarios are explained further on Page 2 of the Western Canyon Communities Circulation Plan and are displayed in Figures D through G in the Appendix. We then took these numbers and separated them into two categories: “Build-out Term based on Residential Growth and Build out Term based on Job Creation”. Please see the table below.

TABLE 1-2
BUILD-OUT TERM BASED ON RESIDENTIAL GROWTH AND JOB CREATION

| Scenario Name | Residential Growth | | | Job Creation | | |
|---|------------------------------|-----------------------------|-------------|----------------|-----------------------------|-------------|
| | Average Number of Households | Term to Buildout (In Years) | | Number of Jobs | Term to Buildout (In Years) | |
| | | 3% Growth | 1.5% Growth | | 3% Growth | 1.5% Growth |
| Smart Growth | 12,500 | 60 | 115 | 15,400 | 80 | 165 |
| Commercial/ Food Processing | 12,500 | 60 | 115 | 21,200 | 95 | 185 |
| Commercial/ Industrial/ Food Processing | 12,500 | 60 | 115 | 24,500 | 95 | 195 |
| Commercial/ Industrial | 12,500 | 60 | 115 | 26,800 | 100 | 200 |
| Sprawl | 7,800 | 45 | 85 | 1,500 | 5 | 8 |

The tables above show that, based on COMPASS data, residential growth in this area is expected to significantly outpace job creation. Residential buildout is projected (given a growth rate from 1.5% – 3%) within 60 – 115 years. Buildout based on job creation (given the same growth range) is projected within 80 – 200 years in the first four scenarios.

Transportation (roadway and rail) data for this area was completed in the COMPASS study entitled “Western Canyon Communities Circulation Plan”. The roadway portion of that report was completed by COMPASS and examines the completed build-out scenario. The Peckham Road Corridor Study mainly examines the wet utilities (water and sewer), dry utilities (gas, power and communications), along with local business and agency input. This study was completed with a 40-year planning timeframe to provide a planning tool that could be utilized by Greenleaf and Wilder’s Planning and Zoning entities.

TRANSPORTATION

2. Roadways

COMPASS was tasked by Sage Community Resources to produce the transportation document for the overall Enterprise Zone. The COMPASS Study looks at necessary roadway sections, right-of-way, section thicknesses, and number of lanes at the time of complete build-out of the Peckham Road area for the five scenarios outlined on page 2.

Peckham Road, between the cities, is currently under the jurisdiction of Golden Gate Highway District (GGHD). With COMPASS examining the long-term future construction of the roadways and right-of-ways, we examined the short-term issues of growing an industrial area within a differing roadway jurisdiction.

Complete annexation of this roadway will not occur immediately at the time of water and sewer utility extension along this corridor. Therefore, the initial stages of development (the next 40 years) of the Peckham Road Area will require extensive coordination between the City of Wilder, City of Greenleaf and Golden Gate Highway District. To attempt to uncover any possible conflicts with utility extensions and increased traffic loadings, we presented the Peckham Road Area concept to Mr. Brad Burge, Director of Golden Gate Highway District.

Mr. Burge stated that the Highway District would support the idea of an industrial area along Peckham Road. Golden Gate would prefer the cities annex Peckham at the time sewer and water is installed in the right-of-way, but realizes there will be a period of time when the cities' utilities will be within Golden Gate Highway District right-of-way. Mr. Burge stated that he is not opposed to having City utilities within Highway District roadways provided that the utilities follow Highway District standards and license agreements are signed between the appropriate City and the Highway District. Golden Gate's standards for wet utilities mesh well with the City of Wilder & City of Greenleaf's standards: sewer on the centerline of roadway, with water and pressurized irrigation (or re-use water) on either side.

With respect to the existing rail line along Peckham and any future expanded use of rail, Golden Gate Highway District does not have any additional regulations for railroad crossings. Mr. Burge stated that Idaho Northern & Pacific has their own set of regulations that are fairly exhaustive. All railroad crossings will be addressed and permitted on a case-by-case basis. Mr. Burge stated that the Highway District has not had any problems with the existing rail crossings of their roadways. In certain instances, the rail crossings have required maintenance, and Idaho Northern & Pacific has been extremely responsive to the highway district's maintenance requests.

Currently, Golden Gate Highway District does not have any projects scheduled on Peckham. Mr. Burge stated that Peckham is a bituminous surface treated (BST) road that adequately carries its traffic and requires minimal maintenance. There are some existing maintenance concerns with Peckham Road. Stormwater drainage problems currently exist on the north side of Peckham Road. The existing irrigation ditch and land on the north side of the road is higher in elevation than the roadway, thus causing drainage problems.

When widening Peckham, moving the centerline of the roadway to the south may be more feasible than widening from the center of the roadway due to the irrigation ditches directly north of Peckham. An additional future constriction is located on the west end of the corridor near Assumendi Produce. Assumendi Produce is located very close to the existing roadway and an irrigation ditch is located on the north. Relocation of the irrigation ditch and associated irrigation boxes will be a costly modification, but at this time, would be more cost effective than relocating existing buildings and a business. This area should be monitored closely in the future to ensure opportunities to improve this area for the future corridor are not overlooked.

Golden Gate Highway District does not currently have any crossing agreements with Wilder Irrigation District

for their facilities within the Peckham Road Area. At the time of any rebuild or modification of the irrigation facilities within the right-of-way, crossing agreements would be required by GGHD.

Brad Burge, Director, Golden Gate Highway District stated that the District would be in favor of standard access management along the Peckham corridor. Standard access is defined by the highway district as 330' spacing between access points. This would provide more access than is probably necessary with, in theory, 16 access points per mile on Peckham Road.

The existing dry utilities within Peckham Road have rights (through signed license agreements) to be in the Highway District's right-of-way. Mr. Burge stated that the highway district also has an excellent working relationship with the dry utility companies within the Peckham corridor and has found them to be responsive to maintenance requests.

3. Railroad

IDAHO NORTHERN & PACIFIC RAILROAD

When approached with the idea of creating an industrial zone abutting the existing rail line, Mr. Bob Adams, Director of Track Structures & Mechanical, Idaho Northern & Pacific Railroad (INPR) was very supportive. Mr. Adams stated that INPR would like to encourage the cities and Canyon County to plan and zone industrial and agricultural uses along their rail corridor in an effort to minimize potential residential conflicts near their tracks. Residential zones near railways have proven to be safety and maintenance problems, Mr. Adams added.

Mr. Adams stated that rail becomes a viable option, compared with trucking, when the loads are heavy and the distance is relatively long. Mr. Adams cited R&M Steel as an example. R&M orders approximately 120 cars per year and saves nearly \$4,000 per car, when compared to standard trucking costs. In a conversation with Dan Custer of R&M, Mr. Custer verified that the rail had saved them significant shipping costs, but was unsure of the exact savings per railcar.

Idaho Northern and Pacific Railroad (INPR) has a 50-year lease from Union Pacific (UP) on this stretch of track. INPR has authority over this stretch of track alongside SH-19 (near Caldwell) and throughout the Peckham Road Area. Union Pacific will not be involved with contracts, agreements, etc. Mr. Adams stated that this should help to expedite any applications for private crossings or rail spurs.

South side of Peckham looks to be the best place for spurs and industrial business, because spurs then do not have to cross Peckham Road, which can be costly. In order for simplicity, INPR prefers that each business have its own rail spur. Mr. Adams stated that, in his experience, it is difficult for multiple businesses to coordinate on- and off-loading schedules to coincide efficiently when a spur is shared. However, INPR does allow spurs to be shared. These shared spurs are called a "Team Track". Mr. Adams stated Team Tracks tend to operate better when one company is in charge of the loading and unloading for all participant companies.

INPR pays for operation and maintenance of tracks on their own right-of-way, and businesses pay for, own and maintain tracks and switches on their property. At the time of a new switch or track being laid, a business and the railroad enter an Industry Track Agreement (ITA) outlining responsibilities, associated costs, and rights-of-way. Businesses do have to pay the railroad for adding new switches on the main line, plus an annual maintenance fee. Mr. Adams did state that some grants do exist for new rails spurs for businesses. In the case of the New Plymouth Bio Diesel plant, that business was able to utilize an Economic Development grant to fund their portion of the rail improvements.

Idaho Northern & Pacific has no restriction on spacing between switches or any restrictions on spacing between crossings of roads. Road crossings do, however, require the permission of the highway district as discussed

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above. Active signals (with arms) are not typically required; just standard cross-buck signs and a trainman flagger for crossing times. One example of a road crossing to a business is at the current location of J.C. Watson on Peckham near Allendale Road.

Some associated approximate costs with the implementation of rail spurs are as follows:

Installation Costs:

- Standard switch on the main line: \$35,000-\$50,000
- Fully operational signalized crossing: \$500,000
- Cost per foot of private rail (installed on private property): \$125-150/Linear foot (LF)
- Private crossing of a roadway or entrance: \$150-250/ LF

Annual Maintenance Costs:

- Annual maintenance fee for mainline switch to a spur: \$1,500.
- Industry Track Agreement (provides for maintenance to rail): \$1,500-2,500 per year
- Property Lease (provides individuals the right to get onto railroad property or right of way for purposes of loading or offloading): \$1,500 – \$2,500 per year
- A demurrage charge is assessed if cars are not unloaded or loaded in a predetermined time (usually 3 days). Mr. Adams stated that this is not usually an issue, but charges of \$50/day are levied if necessary.

Crossing Permits:

If a proposed crossing is within city limits, a business or individual can get a crossing permit without state approval. Outside of city limits, the Idaho Transportation Department (ITD) must approve all roadway crossings. The contact person for ITD with regard to crossing permits for rail is Robert Linkhart (334-8492).

Determination of whether standard crossbucks or a fully operational signal is warranted is examined and determined on a case-by-case basis by INPR. All rail spurs, crossings and switches must be built to Union Pacific standards that are outlined in detail at UP.com. Ms. Sandy Lindstrom, Regional Manager can provide assistance to any design questions business owners or their representatives may have.

Note: The rights to the railway along Peckham Road are currently in the process of being purchased by WATCO Companies, Inc from Idaho Northern & Pacific. It is anticipated that by December 2009, WATCO Companies will be operating and maintaining this railway. Impacts of this purchase are unknown at this time.

WATER AND WASTEWATER SYSTEM PLANNING

The following sections describe planning for the water and wastewater system for the Peckham Road Area. COMPASS land use build-out scenarios were used to establish utility service areas for the water and wastewater systems for the Peckham Road Area. This information was then used, along with COMPASS estimates for residential and job growth, to estimate both water demand and wastewater production for the Peckham Road Area. Finally, the estimates for water demand and wastewater production were used to recommend new water and wastewater facilities for the Peckham Road Area.

4. Population Projection and Future Land Use

COMPASS has developed the following build-out scenarios for the Peckham Road Area located between the cities of Greenleaf and Wilder (see Figures D through G in the Appendix):

- Smart Growth (Combination of Commercial, Industrial, Food Processing, and Agricultural land uses)
- Commercial Industrial
- Commercial Food Processing
- Commercial Industrial Food Processing

Please note the sprawl scenario was not included in the water and wastewater planning due to the desire of both Wilder and Greenleaf to eliminate this possibility from their planning models and their future City layouts.

In addition, COMPASS has made predictions of residential population and total jobs for each land use type for a full build-out and a 40-year planning horizon, assuming 3% growth for both residential population and jobs. These predictions can be seen on page 2 of the Western Canyon Communities Circulation Plan.

An analysis of the full build-out condition is included in this report for reference only. The recommendations for water and wastewater infrastructure to service the Peckham Road Area will be based on the 40-year planning horizon.

5. Existing Water and Wastewater Infrastructure

There is currently no existing public water or wastewater infrastructure in place connecting the cities of Wilder and Greenleaf. Both cities own and maintain their own separate water and wastewater systems, which are described below.

WATER

The City of Wilder's water supply is provided by two groundwater wells with capacities that range from 260-330 gpm (total system capacity of 590 gpm). Water storage is provided via two reservoirs with 31,000 gallons and 278,000 gallons of storage, respectively. The 31,000 gallon tank is an elevated tank, while the 278,000 gallon tank is a ground level tank with a pump station that boosts water from the tank into the distribution system. The water distribution system consists of lines between 3-inches and 8-inches in diameter.

The City of Greenleaf's water supply is provided by four groundwater wells with capacities that range from 30-460 gpm (total system capacity of 715 gpm). Water storage is provided via two reservoirs with 200,000 gallons and 100,000 gallons of storage, respectively. Water is boosted into the distribution system through pumps located at each reservoir site. The distribution system consists of lines between 4- and 12-inches in diameter.

WASTEWATER

The City of Wilder's existing wastewater collection system consists of approximately 30,000 lineal feet of gravity sewer lines and 590 lineal feet of pressure sewer lines. Wastewater is collected by the gravity lines, routed to the City's sole lift station and then pumped to the wastewater treatment plant (WWTP), as shown in City of Wilder's Sewer Collection and Water Distribution Plan (dated February 2008). Design is currently underway to increase the capacity of the WWTP to 0.48 MGD in order to meet wastewater demands through 2011. In addition, the 2007 City of Wilder Wastewater Treatment Facilities Plan recommends phasing to a mechanical treatment facility that would have a full build-out capacity of 1.45 MGD in order to meet projected wastewater demands through 2026.

The City of Greenleaf's existing wastewater collection and treatment system consists of private and public septic systems. Private septic systems serve approximately 90 percent of the City, while a public septic system serves the remaining 10 percent of the City. The City is currently completing a plan to construct a new gravity conveyance system and Membrane Biological Reactor (MBR) WWTP that will replace the existing septic systems. The WWTP is initially being designed for 0.15 MGD capacity to serve the current population. There are also plans to expand the WWTP to 0.35 MGD in the future. In addition, the City is currently researching the potential to increase the footprint of the WWTP site, which would allow for room to expand the plant capacity to 1.00 MGD. The MBR WWTP will be located in the new Greenleaf Air Ranch Development located on the north end of the City, as shown in Figure L in the Appendix.

PROPOSED WASTEWATER REGIONALIZATION

In December 2007, the City of Greenleaf completed the Wastewater Regionalization Study for the cities of Wilder, Greenleaf and Notus (Regionalization Study). This study analyzed three alternative locations for a regional WWTP that would serve all three cities:

- Centralized Location to the Three Cities
- Air Ranch Development Site
- Gravel Pit Property

The Regionalization Study concludes that: "while the overall cost benefits are not overwhelmingly significant to motivate the cities of Wilder, Greenleaf, and Notus to embark on planning and construction of a regional wastewater treatment facility, the long term benefits to meet the growing needs in these communities at an acceptable level of service will be best served by construction of a regional facility." Per discussions with both the cities of Greenleaf and Wilder, the Peckham Road Infrastructure Study assumes that the Greenleaf Air Ranch site is the primary option for the regional WWTP that will serve the Peckham Road Area and the cities of Greenleaf and Wilder in the 40-year planning horizon.

6. Future Water and Wastewater Service Areas

This section describes the water and wastewater service areas for the Peckham Road Area. Traffic Analysis Zones (TAZs), developed by COMPASS, will be used as the basis for defining the utility service areas. The sub-TAZ delineations shown were developed specifically for the analysis of the Enterprise Zone surrounding the Peckham Road Area by COMPASS. The water system, wastewater collection and WWTP service areas differ slightly from one another, but generally serve TAZs 410,430 and 502. These service areas are illustrated in Figures H through J in the Appendix.

WATER SYSTEM SERVICES AREAS

The 40-year water system service area is shown in Figure H. This service area includes Peckham Road Area

between the cities of Wilder and Greenleaf, but does not include areas within the City limits or residential areas in TAZs 410, 430 or 502. This analysis assumes that both the cities of Wilder and Greenleaf will continue to plan, design and maintain water systems that will provide service to all areas within their City limits and residential areas within their respective impact areas.

WASTEWATER SYSTEM SERVICES AREAS

Figure I illustrates the 40-year WWTP service area, which includes the Peckham Road Area, the cities of Wilder and Greenleaf and portions of residential areas within each City's urban growth boundary. As described in Section 5, Greenleaf's new WWTP, located in the Air Ranch Development, will serve as the WWTP for Greenleaf, Wilder and the Peckham Road Area. It is viewed as a viable location for the following reasons:

- Its location, in the northeast corner of the Peckham Road Area, allows wastewater within the selected service area to be routed primarily via a gravity collection system.
- The 2007 Regionalization Study identified two other locations for a regional WWTP. However, no available property was identified for these locations. Also, design of an MBR to service Greenleaf is currently underway with the intent to allow expansion to accommodate future flows from the WWTP service area.
- The Greenleaf WWTP provides flexibility for incorporation into a future regional WWTP, as noted in the 2008 Greenleaf Wastewater Facilities Planning Study. Should further studies recommend construction of a regional WWTP at another location (as recommended in the 2007 Regionalization Study) or should the Greenleaf MBR plant reach its maximum expansion potential within constraints of the site, the Greenleaf MBR plant could be retrofitted to a scalping plant (used to reduce waste loading) at a future date.

The wastewater collection service area (Figure J) includes the City of Wilder, the Peckham Road Area and residential areas of sub-TAZs 502E, 410G, 410H and 430F. While determining the wastewater collection service area, it was assumed that wastewater would be collected by a main gravity line(s) located in Peckham Road. From there, flow will be routed to the east and the WWTP will be located at the Air Ranch Development, in the north end of Greenleaf. It should be noted that the wastewater collection service area differs from the WWTP service area. This study assumes that wastewater from the following TAZs will not be collected by the Peckham Road gravity main, however flows from these areas will be routed through other conveyance (pressure) lines to the WWTP:

- 410A (residential area only)
- 410B (residential area only)
- 430A (residential area only)
- 430 B
- 430E
- 430G

As shown in Figure I, planning of conveyance systems to serve these areas is outside the scope of this report.

7. Water and Wastewater Design Requirements

This section discusses general water and wastewater design criteria that will be used when developing conceptual water and wastewater system designs for the Peckham Road Area. Projections for water and

wastewater flow rates will be discussed in the following section.

Capacity of both types of systems will be discussed and quantified in terms of flow rates, such as million gallons per day (mgd) or gallons per minute (gpm). Conceptual analysis and design of the Peckham Road Area water and wastewater systems will use the following flow rates:

- Average Day: the total volume of water/wastewater produced in a year, divided by 365 days.
- Maximum Month: the maximum volume of water/wastewater produced during any single month, divided by 30 days.
- Maximum Day: the maximum volume of water/wastewater produced during any single day.
- Peak Hour: the maximum volume of water/wastewater produced during any single hour.

WATER

This report assumes that there is adequate groundwater supply and groundwater rights to allow the water system that serves the Peckham Road Area to have a similar approach to supply and distribution as the existing water systems in Wilder and Greenleaf. Water will be supplied through groundwater wells, stored in above ground storage reservoirs, pumped from the storage reservoirs into the system by booster pumps and distributed to the Area via a looped closed-conduit distribution system.

The following is a list of the criteria used in this report to determine the required capacity of new water supply wells, storage reservoirs and distribution piping for the Peckham Road Area:

- 1) Provide enough water supply well capacity with backup power generators to satisfy maximum day demands with a minimum of two supply wells (IDAPA 58.01.08.513).
- 2) Provide enough firm pumping booster capacity to satisfy peak hour demands (IDAPA.58.01.08.541.02).
- 3) Provide storage to satisfy peak hour demands (4 hour duration) + fire flow anywhere in the water system. (4 hour duration commonly used by water purveyors in the Northwest)
- 4) Provide fire pumping capacity with a single stand-alone fire pump. The approach of providing pumping capacity with a single stand-alone fire pump has been used in other communities in Idaho, however it should be noted that the Idaho Department of Environmental Quality (DEQ) reviews this approach to meeting firm capacity requirements on a case-by-case basis. DEQ approval of this approach for the Peckham Road Area will have to be confirmed when more detailed design of the system is completed in the future.
- 5) Provide water storage that includes the following elements (IDAPA 58.01.08.003.16):
 - Operational Storage
 - Equalization Storage
 - Fire Suppression Storage
 - Standby Storage
- 6) Provide looped distribution piping capable of conveying required fire flow plus maximum day demands to any part of the water system (IDAPA 58.01.08.17.a).

In this report, *firm pumping capacity* is defined as the total pumping capacity with the largest pump out of service. *Fire flow* requirements will be quantified in the next section.

WASTEWATER

As discussed in the previous section, wastewater will initially be collected and conveyed by gravity sewer mains and conveyed to the WWTP located at the Air Ranch Development in Greenleaf. As wastewater flows increase in the future there will be a need to increase the capacity at the WWTP and/or develop a second regional WWTP.

The following is a list of criteria that are used in this report to determine the capacity of a new wastewater collection system and WWTP required for the Peckham Road Area:

- 1) Provide general WWTP capacity to treat maximum month flows.
- 2) Provide a conveyance system that conveys peak hour flow.
- 3) Provide a conveyance system that meets the Great Lakes Upper Mississippi River Board Recommended Standards for Wastewater Facilities (10 States Standards) for minimum pipe slope.

8. Wastewater Production and Water Demand Projections

This section provides criteria and results for wastewater production and water demand for the Peckham Road Area. The results of this analysis will be used to provide recommendations to the water and wastewater facilities in the next section.

ANALYSIS APPROACH

COMPASS developed estimates for the number of households and jobs in the Peckham Road Area for both the full build-out condition and the 40-year planning horizon. These estimates were used to determine a base flow number for water demand/wastewater production. Additional flows were estimated for the different land use types that may be located in the area. For the purposes of this analysis, average day water demand and wastewater production are assumed to be equal.

The following criteria were used for average day water demand and wastewater production on a per capita basis, which is reported in gallons per capita per day (gpcd):

- 1) Residential - 120 gpcd (based on 2007 Wilder Wastewater Treatment Facilities plan. Includes 41 gpcd for infiltration/inflow)
- 2) 3.4 people per household (based on the average between Wilder and Greenleaf from 2000 Census figures)
- 3) Jobs - 15 gpcd for typical office user (Metcalf and Eddy, Inc. Wastewater Engineering Treatment, Disposal and Reuse, McGraw Hill, 1991. New York.)

Additional flows for each land use type are based on the interviews performed with local business (See Item S in the Appendix). Examples of water demand/wastewater production from businesses throughout the state were also used as additional example data points. Table 8-1 summarizes the example businesses used to estimate water demand and wastewater production for this report.

TABLE 8-1

EXAMPLE BUSINESSES USED TO ESTIMATE ADDITIONAL WATER/WASTEWATER FLOW

| Business | Location |
|--|------------------|
| COSSA (Vocational School) | Greenleaf/Wilder |
| Hansen Eagle Precast (Concrete Product Manufacturer) | Greenleaf |
| Rhodes Bakery | Caldwell |
| R&M Steel (Pre-Fabricated Building Manufacturer) | Caldwell |
| Asumendi Produce | Wilder |
| JC Watson (Onion Produce Sheds) | Wilder |
| Amalgamated Sugar | Nampa |
| Elmer's Restaurant | Nampa |
| Great American Appetizers | Nampa |
| Micron Technology | Nampa |
| Seminis (Fruit & Vegetable Seed Producer) | Nampa |
| Simplot (Potato Processing) | Nampa |
| Squeaky Clean (Truck Wash) | Nampa |
| Con-Agra Foods (Potato Processing) | Twin Falls |
| Anheuser Bush Malting Plant | Idaho Falls |
| Nestle Foods (Potato Processor) | Moses Lake, WA |

Table 8-2 summarizes the additional flows assumed for each land use type. Low flow and high flow production scenarios were analyzed for each build-out scenario. The table shows that no additional flow loads are assumed for residential, commercial or agricultural land uses. A maximum month flow rate of 0.25 gpm/acre was used for food processors in the low flow scenarios. This assumes that there will be one "wet" facility similar to Great American Appetizers in each sub-TAZ, with the remaining food processors running as dry facilities. A single 1 mgd maximum month load was used for the high water use scenario, for full buildout, with food processors. This load is equivalent to (1) Amalgamated Sugar, (1) Simplot, or (25) Great American Appetizer type facilities. A single 0.004 mgd maximum month load was used in the high water use scenario for each sub-TAZ with an industrial land use. This is based on a review of the average water demand of the top industrial water users from the City of Nampa's 2008 Preliminary Draft Water Master Plan.

TABLE 8-2
ADDITIONAL FLOWS FOR VARIOUS LAND USE TYPES

| Water Demand/ Wastewater Production Scenario | Land Use Type | | | | |
|---|---------------|------------|------------|--------------------|-------------|
| | Residential | Commercial | Industrial | Food Processing | Agriculture |
| Additional Low Flow Demand/ Production | - | - | - | 0.25 gpm/ acre | - |
| Additional High Flow Demand / Production | - | - | .004 MGD | 1 MGD | - |

Fire flow requirements vary with building type and use of fire sprinklers. This report assumes that buildings will be sprinklered (or supplemental site tank storage will be provided) as required so that maximum fire flow will not exceed 3,500 gpm (5.04 mgd) for three hours. This is a conservative fire flow rate from the surveyed businesses (see Table 8-1) and discussions with the Idaho Surveying and Rating Bureau.

ANALYSIS RESULTS

Projected water demands and wastewater production are summarized in Table 8-3 and 8-4, respectively. These results are used to develop design concepts for the enterprise area water and wastewater systems in Sections 9 and 10.

TABLE 8-3
PROJECTED WATER DEMANDS

| Description | Projected Water Demand (MGD) | | | |
|-----------------------------|------------------------------|---------|----------------|---------|
| | 40-Year Planning Horizon | | Full Build-out | |
| | Minimum | Maximum | Minimum | Maximum |
| Maximum Day Water Demand | 0.15 | 0.32 | 0.93 | 2.21 |
| Peak Hour Water Demand | 0.28 | 0.61 | 1.76 | 4.19 |

TABLE 8-4
PROJECTED WASTEWATER PRODUCTION

| Description | Projected Water Demand/ Wastewater Production (MGD) | | | |
|--|--|---------|----------------|---------|
| | 40-Year Planning Horizon | | Full Build-out | |
| | Minimum | Maximum | Minimum | Maximum |
| Maximum Month Wastewater Production (WWTP Service Area) | 1.52 | 1.66 | 3.80 | 5.11 |
| Peak Hour Wastewater Production (wastewater collection service area) | 1.29 | 1.70 | 3.16 | 6.12 |

Note that the projections for peak hour water demand differ from the peak hour wastewater production. This is because the water system service area differs from the wastewater collection system service area (see Section 6 for details).

In addition, the peak hour wastewater production (used for wastewater collection system sizing) is only greater than the maximum month wastewater production (used for WWTP sizing) when looking at the maximum/high flow range. Peak hour production is less than maximum month production when looking at the minimum/low flow range. There are two factors that cause this:

- The WWTP service area is larger than the collection systems service area (see Section 6). This results in a peak hour flow rate that is less than the maximum month flow rate in the minimum/low flow range.
- As described earlier in this section, the high flow scenarios in this analysis assume that there are industries in the Peckham Road Area that have a much higher wastewater production than other businesses (e.g. Amalgamated Sugar or Simplot). The assumed peak hour wastewater production from these businesses is large enough that the peak hour flow is greater than the maximum month flow in the maximum/high flow range despite of the difference in service area size.

9. Water System Recommendations

WATER SUPPLY

Table 9-1 shows the number of wells required for the Peckham Road Area water system for both full build-out and the 40-year planning horizon. This table assumes that a minimum well capacity of 400 gpm (0.58 mgd) can be obtained with future wells and the firm capacity of the wells will meet maximum day demand. The analysis shows that a minimum of two wells will be needed to supply water for the Peckham Road Area for the 40-year planning horizon. Wells can be added to the system as required as demand increases beyond the 40-year planning horizon projections.

TABLE 9-1
WATER SUPPLY REQUIREMENTS

| Scenario | Maximum Day Demand (MGD) | Wells Required |
|--|--------------------------|----------------|
| 40-Year Planning Horizon – Minimum Flow Projection | 0.15 | 2 |
| 40-Year Planning Horizon – Maximum Flow Projection | 0.32 | 2 |
| Full Build-out – Minimum Flow Projection | 0.93 | 3 |
| Full Build-out – Maximum Flow Projection | 2.21 | 5 |

WATER STORAGE AND BOOSTER PUMPING

As described in Section 7, water reservoirs will be required to provide storage for operational, equalization, fire suppression and standby storage. The analysis shows that a total storage volume of 750,000 gallons for the 40-year planning horizon and 845,000-1,000,000 million gallons is required for full build-out. Because of the required volume, it is assumed that the reservoir will be a ground level storage tank. Table 9-2 summarizes the storage requirements for the Peckham Road Area.

TABLE 9-2
WATER STORAGE REQUIREMENTS

| Scenario | Required Storage Volume (Thousand Gallons) | | |
|--|--|---------------------------|--------------------|
| | Fire Suppression | Equalization ¹ | Total ² |
| 40-Year Planning Horizon – Minimum Flow Projection | 630 | 22 | 717 |
| 40-Year Planning Horizon – Maximum Flow Projection | 630 | 48 | 746 |
| Full Build-out – Minimum Flow Projection | 630 | 139 | 845 |
| Full Build-out – Maximum Flow Projection | 630 | 331 | 1,060 |

¹ Equalization storage is the difference between peak hour demand and the maximum daily demand over 4 hours

² Total includes a minimum 10% allowance for operational storage. It is assumed that emergency generation will be provided for the water supply wells, and therefore no standby storage will be required.

There is not adequate topographic relief across the Peckham Road Area to provide adequate system pressure from a ground level water storage reservoir; therefore pumping systems will be required to boost water from the reservoirs into the distribution system. There are several possible pumping system configurations that can be used to meet average day, peak hour and fire flow demands. This report recommends that a small jockey pump be used to supply average day demands with larger pumps used to meet maximum day and peak hour demands. A minimum of three pumps are required in order to meet firm capacity requirements (firm pumping capacity is defined in Section 7 as the total pumping capacity with the largest pump out of service). A separate fire pump would provide for fire flow. Table 9-3 summarizes booster pumping requirements for the Peckham Road Area.

TABLE 9-3
WATER PUMPING REQUIREMENTS

| Scenario | Required Pumping Capacity (MGD) | | |
|--|---------------------------------|-------------------------------|------------------|
| | Average Day Demand | Peak Hour Demand ¹ | Fire Flow Demand |
| 40-Year Planning Horizon – Minimum Flow Projection | 0.06 | 0.28 | 5.04 |
| 40-Year Planning Horizon – Maximum Flow Projection | 0.12 | 0.61 | 5.04 |
| Full Build-out – Minimum Flow Projection | 0.37 | 1.76 | 5.04 |
| Full Build-out – Maximum Flow Projection | 0.88 | 4.19 | 5.04 |

¹ A minimum of three pumps required to meet firm capacity requirements

WATER DISTRIBUTION

A looped water distribution system will deliver flow from the storage tank(s) to the users throughout the Peckham Road Area. 16-inch diameter pipe is recommended for the main distribution line on Peckham Road for the following reasons:

- Initial build-out is assumed to be along Peckham Road, and it is assumed that, initially, the system will not be looped. A 16-inch line is capable of delivering a 3,500 gpm fire plus maximum day demands without exceeding 10 feet per second (fps).
- A 16-inch line minimizes head loss when conveying fire flow plus maximum daily demand, which gives flexibility to the location of the water supply, storage and booster pumping system. Fire flow plus maximum daily demand can be conveyed across the length of Peckham Road between Wilder and Greenleaf without exceeding 100 psi, regardless of the location of the water supply, storage and booster pumping system.
- *An 18-inch line could be used in lieu of a 16-inch line due to the possibility an 18-line size may be less expensive and more readily available during the time of construction. However an 18-inch line will store approximately 55,000 gallons of additional volume over its entire length when compared to a 16-inch line. This additional volume could exacerbate the water quality problems that may arise due to slow turn over in the pipeline during the initial phases of development along Peckham Road. Therefore, this needs to be considered when developing a phased buildout plan for the water system (see the detailed discussion of water system phasing in the following section).*
- *A 12-inch line could also be used in lieu of a 16-inch in Peckham Road if available fire flow requirements were reduced. As stated above, a 16-inch line would be capable of delivering 3,500 gpm of fire flow. A 12-inch line could deliver approximately 2,000 gpm. Depending on the types of businesses and construction of buildings, this may be a viable alternative.*

A looped system of 12-inch lines would be provided along county roads to serve the Peckham Road Area as development expands from Peckham Road. Figure K shows a potential layout for the water distribution system. Additional distribution lines will likely be added as development proceeds within the Peckham Road Area. These lines will likely be smaller lines (8- or 10-inch) depending on the system layout and assuming they are looped with the 16- and 12-inch water mains.

The distribution system could be connected with both the City of Wilder and the City of Greenleaf water systems. This would provide the entire area with water supply redundancy greater than if the three systems operated separately. Valving could be provided so that the systems would only share water in emergency situations, and meters could be provided so that the flow of water into each system could be tracked.

The Peckham Road Area can be serviced within one pressure zone, therefore pressure reducing valves (PRVs) are not required for the system.

PHASING CONSIDERATIONS

The water system infrastructure should incorporate the facilities required to service the Peckham Road Area in the 40-year planning horizon. However, future planning and design should incorporate consideration for phasing as the area is developed. Potential phasing considerations include:

- 1) During the initial phases of development, low initial water demand will lead to water quality problems in both the tank and the distribution system because of slow rate of turnover. Options to address this potential problem are:
 - Interconnect with either the City of Wilder and/or the City of Greenleaf during the initial build-out of the development area. This has the additional potential advantages of using the interconnection in lieu of second Peckham Road Area well to meet redundancy requirements (requires approval from DEQ).
 - Provide a standalone fire storage and distribution (potentially use re-use water).
- 2) Design pumping systems to provide adequate capacity for the 40-year planning horizon, but initially install pumps as required for short term to mid-term needs. Add, or replace, pumps in the system as required to serve increasing demands in the future.
- 3) If possible, locate the water wells, reservoir and booster pumping station in close proximity to the location of the initial development in the Peckham Road Area. This will minimize the amount of piping infrastructure that is initially required. It should be noted that the location of the water wells will ultimately be dependent on the available water rights and properties of the aquifer.
- 4) Initially provide a looped 12-inch distribution system and continue the expansion of the looped system during all phases of development in the Peckham Road Area. A looped system creates a minimum of two flow paths from the water sources (e.g. wells or an existing City water system) to any distribution point within the system. A looped 12-inch system will be capable of delivering fire plus maximum day demands without exceeding typical velocity or pumping pressure limitations. *A completely looped system would eliminate the need for a 16-inch line in Peckham Road.*

There is a possibility that a large food processor or industry or group of food processors (e.g. (1) Amalgamated Sugar, (1) Simplot, or multiple Great American Appetizer type facilities) will have water demand or fire flow that cannot be served by the recommended water infrastructure required in this report. In this scenario, any such businesses would need to provide the following additional infrastructure:

- On-site well(s) to meet net additional water demands
- and/or
- On-site fire suppression storage and fire pumps to meet net additional fire flow requirements

Peckham Road Infrastructure Study

Large businesses such as Amalgamated Sugar or Simplot provide numerous challenges to an existing infrastructure, and in most cases, it is not financially feasible to plan for their relocation to a certain area. However, the majority of large businesses examining relocation to an area realize they will have an impact on the local infrastructure and are prepared to assist local governments in upgrades to existing systems. Other options for relatively large water and sewer users include off-system services: private wells and/or private disposal of wastewater. An example a business utilizing this type of system is the Simplot plant located between Greenleaf and Caldwell.

WATER SYSTEM CAPITAL COSTS

Estimated costs of the recommended Peckham Road Area water system for the 40-year planning horizon are summarized in Table 9-4 below.

TABLE 9-4
ESTIMATED WATER SYSTEM CONSTRUCTION COSTS

| System Component | Estimated Construction Cost Range(Thousands) | |
|---|--|-----------------|
| | Minimum | Maximum |
| 400 gpm Water Supply Well | \$140 | \$300 |
| 400 gpm Water Supply Well | \$140 | \$300 |
| 750k Gallon Storage Tank and Booster Pumping System | \$610 | \$1,310 |
| 16-inch Water Main (Peckham Road) (20,000 LF) | \$1,950 | \$4,180 |
| 8-Inch (12,100 LF) and 12-Inch (50,600 LF)Water Distribution System | \$4,230 | \$9,060 |
| Water System Total | \$7,070 | \$15,150 |

10. Wastewater System Recommendations

COLLECTION SYSTEM

A gravity main, located in Peckham Road, will collect wastewater flows from the Peckham Road Area and the City of Wilder, and route it to the WWTP located in the Air Ranch Development in Greenleaf. It is assumed that development along Peckham Road will drain directly to the Peckham Road gravity main line. Smaller collection lines, located along the north-south running county roads, would collect wastewater from developments that could not drain directly to main located in Peckham Road. Wastewater collected at the City of Wilder lift station would be pumped to the east end of the main line in Peckam Road. See Appendix (Figure L) for a preliminary layout of the gravity collection system.

Because of the projected design life of modern collection piping materials, collection systems are sometimes designed for planning horizons of up to 100-years. However, this report recommends planning the gravity collection system for the 40-year planning horizon for the following reasons:

- Projected flows vary considerably depending on the build-out scenario, and this variability has a noticeable effect on the gravity line size required (see table 10-1). Planning for the 40-year planning horizon reduces the initial capital costs for the collection system.

- Future Interceptor Lines (along SH-19 or other corridors) can be constructed at a future date, if necessary, to assist in the east-west transport of wastewater.
- Gravity lines are normally designed to provide scouring velocities during peak flow. If the lines are sized for full build-out, the low flows during the initial years of development will result in low velocities in the pipe which will cause increased settling of solids. This requires additional maintenance costs for the system.

Considering the unknowns related to the actual build-out rate of the area, oversizing the lines for full build-out conditions is not recommended.

TABLE 10-1
WASTEWATER COLLECTION REQUIREMENTS

| Scenario | Peak Hour Wastewater Production (MGD) | Gravity Line Size Required ¹ (inches) |
|--|---------------------------------------|--|
| 40-Year Planning Horizon – Minimum Flow Projection | 1.29 | 15 |
| 40-Year Planning Horizon – Maximum Flow Projection | 1.70 | 18 |
| Full Build-out – Minimum Flow Projection | 4.10 | 24 |
| Full Build-out – Maximum Flow Projection | 6.12 | 36 |

¹ Gravity line capacities are based on full flow capacities based on minimum slopes per 10 States Standards

An 18-inch main line is recommended for Peckham Road and 12-inch lines are recommended for the collection lines located along the north-south running county roads.

A preliminary survey was performed along Peckham Road as part of this report. A profile of an 18-inch gravity line based on the preliminary survey along Peckham Road is included in the Appendix and labeled Item M. This profile assumes a minimum slope of 0.12% per the 10 States Standards. The plan and profile is meant as a planning tool and makes note of some critical areas that will need to be resolved once a complete design is warranted for this sewer extension. An example of this is shown on Sheet 14 of 15 where a lift station, deepening of the line, or re-routing of the sewer line may be necessary to complete the desired trunk line.

LIFT STATIONS

In order to reduce the depth of the gravity main in Peckham Road along its entire alignment, the depth on the west side of the alignment should be minimized. Small lift stations may be required for developments on the north side of Peckham Road and west side of the Peckham Road Area.

The lift station that collects runoff from the City of Wilder and routes it to the existing WWTP will need to be revised and designed to route flow to the collection main located in Peckham Road.

An option to reduce overall depth of the gravity line in Peckham Road is to drain the Peckham Road Area to a lift station, located on Peckham Road midway between the cities of Wilder and Greenleaf. Wastewater would then be pumped to the east until it could flow by gravity through sewer lines, constructed at a lesser depth, to the WWTP. A survey of the entire wastewater collection service area is recommended in order to fully evaluate the feasibility of this option.

WASTEWATER TREATMENT

Analysis of WWTP plant capacity needs in this report are based solely on hydraulic capacity. It should be noted

that certain food processing or industrial operations will create a higher biological oxygen demand (BOD) load than residential or commercial waste, this will impact treatment needs beyond the hydraulic load at the WWTP. Each industry should be analyzed to determine their specific wastewater properties. It may be necessary to require certain industries to provide a level of pre-treatment in order to reduce waste loading at the WWTP regardless of the hydraulic load.

Table 10-2 summarizes the projected range of flows that would be routed to the WWTP. Approximately 1.5-1.6 mgd WWTP capacity is required to treat flow for the 40-year planning horizon while 3.8-5.11 mgd is required to treat flow for the full build-out condition.

TABLE 10-2
WASTEWATER TREATMENT REQUIREMENTS

| Development Scenario | WWTP Capacity Requirements (MGD) |
|--|----------------------------------|
| 40-Year Planning Horizon – Minimum Flow Projection | 1.52 |
| 40-Year Planning Horizon – Maximum Flow Projection | 1.66 |
| Full Build-out – Minimum Flow Projection | 3.80 |
| Full Build-out – Maximum Flow Projection | 5.11 |

The City of Greenleaf is currently developing plans for a new WWTP with a capacity of 0.15 mgd to serve its current wastewater treatment needs. The design has options to increase capacity to .35 MGD in the future. In addition, the City is currently researching the potential to increase the footprint of the WWTP site which would allow for room to expand the plant capacity to 1.00 MGD. This potential expansion would serve the Peckham Road Area for a portion the 40-year planning horizon.

Flow projections show that the maximum capacity of the WWTP (and current expansion plans) will be exceeded within the 40-year planning horizon. Options to treat flow that exceed the capacity of the plant at that time include:

- Expand the WWTP beyond what is currently planned at its existing location
- Develop a new location for a regional WWTP and convert the Greenleaf WWTP to a scalping plant
- Abandon the WWTP and route flow to regional WWTP at a new location

WASTEWATER SYSTEM CAPITAL COSTS

Estimated costs of the recommended Peckham Road Area wastewater system for the 40-year planning horizon are summarized in Table 10-3. Costs for the WWTP assume that the new Greenleaf WWTP can be expanded to a capacity of 1.5 MGD at its existing location.

TABLE 10-3
ESTIMATED WASTEWATER SYSTEM CONSTRUCTION COSTS

| System Component | Estimated Construction Cost Range(Thousands) | |
|---|--|-----------------|
| | Minimum | Maximum |
| Peckham Road 18-inch Sewer Main | \$1,886 | \$4,041 |
| 12-Inch Sewer Collector Lines | \$1,412 | \$3,025 |
| 1.70 MGD Lift Station ^{1,2} | \$490 | \$1,050 |
| 12-inch (8,300 LF)FM ¹ | \$660 | \$1,414 |
| <i>Total Cost for Lift Station and Force Main¹</i> | \$1,150 | \$2,464 |
| WWTP Capacity Upgrade to 1.5 MGD ³ | \$4,900 | \$10,500 |
| Wastewater System Total | \$8,198 | \$17,566 |

¹ Lift station and force main costs are included for comparison purposes only and are not included in the wastewater system cost total.

² Lift station is sized to serve the collection system service (see Section 3)

³ Assumes that Greenleaf continues with planning to increase WWTP capacity to 1 MGD. Cost is based on the \$14/gallon of treated wastewater rate used in the Regionalization Study

11. Summary of Water and Wastewater System Recommendations

The recommended Peckham Road Area water and wastewater system facilities for the 40-year planning horizon are summarized in Table 11-1 and illustrated in Figures K and L.

TABLE 11-1
COMBINED WATER AND WASTEWATER SYSTEM CONSTRUCTION COSTS¹

| System Component | Estimated Construction Cost Range(Thousands) | |
|-------------------------|--|----------|
| | Minimum | Maximum |
| Water System Total | \$7,070 | \$15,150 |
| Wastewater System Total | \$8,200 | \$17,565 |

¹ Detailed cost estimates are shown in Table 9-4 for Water System and Table 10-3 for the Wasterwater System

It should be noted that the future businesses that are served in the Peckham Road Area could vary significantly from the assumptions in this document. The assumptions should be reviewed in detail before the recommendations of this report are implemented.

The intent of this report is to provide general design concepts for budgetary purposes. The following details will need to be discussed in future planning and design efforts as planning and development of the Peckham Road Area and overall Enterprise Zone continues:

- DEQ approval of water and wastewater system design approaches
- Final location and size of facilities
- Phasing approaches

- Integration with Wilder and Greenleaf systems
- Requirements for forming utility district for the development area
- Survey the entire Peckham Road Area and perform alternatives analysis for gravity sewer/lift station requirements
- Develop wastewater pretreatment requirements as specific industries are identified
- Perform hydrogeologic study to confirm available water rights and potential well capacities
- Confirm industry peak hour water demands/wastewater production. These numbers can vary widely and could potentially have a significant impact on collection system sizing.
- Evaluate potential to limit fire flow provided by the system to less than the 3,500 gpm, four-hour duration that is assumed in this report. Limiting the flow/duration that is available for fire suppression will decrease water storage and distribution line size requirements.

12. Effluent Options

This section attempts to examine some options for effluent produced from the WWTP. One of the options in which both cities expressed interest, is a partnership with local businesses to supply them with the effluent at a relatively low cost. Unfortunately, the business owner interviews did not yield many local businesses or landowners interested in utilizing Class A or B wastewater effluent. Food processing companies must use potable water for both their preparation and cleaning process for sanitary reasons. There are also a number of businesses in the area that run a basically “dry” business, meaning the only water they utilize is for restrooms. These businesses include the onion sheds (J.C. Watson and Asumendi Produce) and R&M Steel.

Additionally, the vast majority of landowners in the area have existing surface water rights through either Wilder or Riverside Irrigation Districts. Aerial maps were analyzed and calls were placed to the irrigation districts to determine if any areas near the proposed WWTP site were currently absent of irrigation water rights. A scenario in which the cities could offer irrigation water to a currently dry piece of ground would provide an optimal solution for disposal of the effluent. However, no property appeared to currently meet the necessary requirements.

Golden Gate Highway also does not have a use for non-potable (re-use) water as they run a dry operation. With only eight miles of gravel road in the district, they have no need for non-potable water for dust abatement. Washing of trucks and equipment is also quite minimal.

However, three possible options were discovered during our discussions with local business owners. The first is Hanson Eagle Precast located approximately ¼ mile west of the City of Greenleaf on Highway 19. Hanson Eagle Precast is a precast concrete plant that batches approximately 200 cubic yards (CY) of concrete per day during their busy season and approximately 15 CY offseason. Each cubic yard uses approximately 28 gallons of water. The water used for batching concrete must be consistent and tested regularly to ensure a consistent product. For these reasons, batching of concrete would most likely not be a good use for Class A or B effluent. The water used for batching, however, is a small portion of the total water Hanson Eagle Precast uses. Water is used for dust control, sprinkling aggregates, and the cleaning of concrete trucks and equipment. The managers of Hanson estimate they use approximately 20,000 gallons of water per day at peak operation and about 5,000 gallons per day during offseason, with the majority of this water used for non-batching purposes.

Hanson already has an existing well and associated water right. Therefore, their costs for water are solely

electrical power for their pump and maintenance. The re-use water would need to be provided at a very low cost to make financial sense for them.

The second promising lead for disposal of re-use water was Idaho Northern & Pacific Railroad (INPR). Mr. Bob Adams stated that the railroad would be willing to talk to the cities of Greenleaf and Wilder about using re-use water to sprinkle areas within the railroad right-of-way. INPR currently allows farmers within the area to disc, plant and harvest alfalfa and other crops within their right-of-way to remediate the weed spraying and maintenance normally required. Mr. Adams stated that he was not the final decision maker, but that INPR would be interested in signing a maintenance agreement with the cities that would allow them to level, plant, irrigate, harvest and maintain the rights-of-way along Peckham Road.

A third option discussed in our meetings with the cities is irrigation of grapes within the area. Grapes normally require water earlier in the season than irrigation water is available. Re-use water could be used for this, but most likely for only a month or two.

With the abundance of water rights in the area and the potential legal and political problems that would be associated with property owners selling or relinquishing their water rights, irrigation for agricultural enterprises does not appear to be a consistently viable option to dispose of the re-use water at this time.

While presently it does not appear that utilizing Class A or B effluent is an economically viable alternative to discharge or disposal, this may change in the future as discharge restrictions increase and as the Peckham Road Area develops. In order to provide options prior to re-use being a viable alternative, we have outlined the following various options for effluent disposal below.

CLASS A VERSUS CLASS B EFFLUENT

An ongoing decision for the cities of Wilder and Greenleaf will be the level on which to treat effluent. Treatment requirements for Both Class A and Class B wastewater are as follows:

- Treatment process including oxidation, coagulation, clarification, and filtration.
- Turbidity < 2 NTU (Nephelometric Turbidity Unit) (average daily) for granular and cloth filters.
- Turbidity < 0.2 NTU (average daily) for membrane filters.
- Total Coliform < 2.2 organism/100 milliliters
- The effluent must reach the point of compliance prior to storage.
- Pilot testing is required unless pre-approval by DEQ is granted.

Additional Treatment Requirements for Class A Wastewater when compared to Class B are as follows:

- Complete redundancy to treat peak flow including dual treatment trains, standby power, standby filter units and redundant monitoring equipment.
- Alternate disposal option or lined storage capable of storing 7 days effluent, automatically activated if turbidity exceeds limits.
- Additional disinfection requirements, including 5-log inactivation for UV Systems, or 450 CT (Concentration/Contact Time).
- Automatic filter to waste capability.
- Total Nitrogen < 10 mg/l for groundwater recharge or < 30 mg/l for irrigation. (Additionally, this requirement may be lower depending on predicted groundwater impacts)

- Likely special considerations and/or enhanced nitrogen removal due to Ada Canyon Nitrate Priority Area designation (with Class A or B treatment).
- Five-day Biochemical Oxygen Demand (BOD5) < 5 mg/l for groundwater recharge or < 10 mg/l for irrigation.

Class A effluent can be used for the following:

- Residential irrigation
- Groundwater recharge
- Any Class B or lower use

Class B effluent can be used for the following:

- Irrigation of parks, playgrounds, golf courses
- Irrigation of edible food crops
- Rapid infiltration basins
- Specific fire and dust suppression
- Toilet flushing
- Any Class C or lower use

Given the requirements and uses of Class A and B effluent, along with the associated costs, it appears that presently implementing a Class B level of treatment with the option to expand the system to a Class A system in the future may be the most financially feasible option.

WASTEWATER LAND APPLICATION REQUIREMENTS

Land applying wastewater is another area in which both cities expressed interest. There are a number of regulations for land application. This section will attempt to show the differences between land application requirements of Class A and Class B effluent.

Class A Effluent

- Can be used for residential irrigation (during periods of non-use).
- No buffers are required to public access or dwelling units.
- 100' buffers are required to potable water wells.
- Purple pipe is required.
- A licensed operator of the distribution system is not required.
- No residual chlorine is required in the distribution system.

Class B Effluent

- Site-specific buffer requirements (typically 100' minimum to dwelling units for spray irrigation).
- Standard buffers to wells including 500' to domestic and 1000' to public. Reduced buffers may be allowed dependant on a Hydro-Geologic Study and Well Location Acceptability Analysis.
- Purple pipe is recommended, but not required.
- A licensed operator of the distribution system is required.
- Irrigation of public access areas (golf courses, parks, playgrounds) is allowed only during periods of non-use.
- A residual chlorine concentration of 1.0 mg/l is required at the point of compliance.
- There are increased sampling and monitoring requirements when compared to Class A effluent.

LAND APPLICATION AREA ESTIMATES

Below, we have attempted to provide some reasonable estimates for a Land Application operation as a future effluent disposal option. Our assumptions are outlined below:

- Assumed crop for area estimates is Pasture Grass.
- Irrigation requirement for *Pasture Grass – Low Management* estimated from Evapotranspiration (ET) Idaho precipitation deficit data from the Caldwell National Weather Service (NWS) station.
- Mean precipitation and evaporation data from ET Idaho from the Caldwell NWS station.
- Spray irrigation with an irrigation efficiency of 80% was assumed.
- Three design flows were considered:
 - ▶ 0.35 MGD – Build-out flow for Greenleaf, proposed Phase I Regional WWTP size.
 - ▶ 0.83 MGD – Combined build-out flows for Greenleaf (0.35 MGD) and Wilder (0.48 MGD).
 - ▶ 1.55 MGD – Estimated flow at Smart Growth full build-out.
- Three Land Application Scenarios considered:
 - ▶ Irrigation from April through September with surface water discharge from October through March. (Minimal lagoon storage)
 - ▶ Irrigation from April through October with winter lagoon storage (no surface water discharge or groundwater recharge).
 - ▶ Irrigation from April through October with groundwater recharge from October through March.

Table 12-1 summarizes the estimated irrigation, storage area, and groundwater recharge requirements for the above scenarios.

TABLE 12-1
LAND APPLICATION SCENARIOS

| Design Flow* (MGD) | Scenario | Land Application Area (Acres) | Annual Irrigation (MG) | Lagoon Storage (MG) | Approximate Lagoon Area (acres) | Groundwater Recharge (MG) |
|--------------------|---|-------------------------------|------------------------|---------------------|---------------------------------|---------------------------|
| 0.35 | Irrigation Apr-Sept; Discharge Oct-Mar | 92 | 64.0 | 2.5 | 1.1 | - |
| | Irrigation Apr-Oct; Winter Storage | 110 | 124.0 | 60.0 | 27.0 | - |
| | Irrigation Apr-Oct; GW Recharge Oct-Mar | 92 | 69.0 | 2.5 | 1.1 | 69.0 |
| 0.83 | Irrigation Apr-Sept; Discharge Oct-Mar | 218 | 151.0 | 6.0 | 2.7 | - |
| | Irrigation Apr-Oct; Winter Storage | 258 | 290.0 | 142.0 | 63.9 | - |
| | Irrigation Apr-Oct; GW Recharge Oct-Mar | 218 | 163.0 | 6.0 | 2.7 | 140.0 |
| 1.55 | Irrigation Apr-Sept; Discharge Oct-Mar | 408 | 283.0 | 11.0 | 5.0 | - |
| | Irrigation Apr-Oct; Winter Storage | 482 | 542.0 | 265.0 | 119.0 | - |
| | Irrigation Apr-Oct; GW Recharge Oct-Mar | 408 | 305.0 | 11.0 | 5.0 | 261.0 |

* Estimated flow at build-out for Greenleaf = 0.35 MGD

* Estimated flow at build-out for Greenleaf plus Wilder = 0.83 MGD

* Estimated flow at Smart Growth full build-out = 1.55 MGD

- There appears to be approximately 25 acres of suitable irrigation area within the railroad right-of-way along the Peckham Road corridor.
- Pressure irrigation (effluent) line sizes will depend location and quantity of each use on discharge permits and desire of others to utilize the re-use water.

As shown in table 12-1, the area required to contain winter storage gets to be quite large for even the 0.35MGD WWTP. For this reason, we further outline more disposal options below, groundwater recharge and rapid infiltration.

GROUNDWATER RECHARGE AND RAPID INFILTRATION

Other options for disposal of Class A or B effluent include groundwater recharge and rapid infiltration. Currently, the existing Ada Canyon Nitrate Priority Area could severely limit the ability to utilize groundwater recharge or rapid infiltration as a reuse option. These options are, however, discussed in further detail below due to the changing nature of the Nitrate Priority Areas and the attempt of this study to provide pertinent information should future conditions and regulations vary.

GROUNDWATER RECHARGE

- Groundwater recharge is considered reuse of fully treated wastewater.
- Groundwater recharge is acceptable only with Class A wastewater.
- The recharge point must have a minimum buffer of 1000' to down gradient drinking water wells and six (6) months aquifer travel time prior to withdrawal required. Greater requirements may be imposed for public drinking water wells.
- A public utility must control the ground within 1000' or six (6) months aquifer travel time down gradient from the recharge location.
- Effluent must meet groundwater quality standards at the point of compliance.

RAPID INFILTRATION

- Rapid infiltration is considered further treatment for other wastewater classes.
- Not applicable to Class A (because it is considered groundwater recharge).
- All wells within a ½ mile radius of the rapid infiltration site must undergo a capture zone analysis.
- Wells not within a hydraulically isolated lower aquifer that are less than 1-year aquifer travel time from the recharge location are not acceptable.
- Typically, rapid infiltration systems will not meet the stringent nitrogen levels required for discharge to drinking water aquifers.

Due to the stringent requirements of both groundwater recharge and rapid infiltration scenarios, neither of these options appears financially feasible in the short term. The data provided above may be useful at a future date in the development process of the Enterprise Zone and Peckham Road Area.

13. Utility District

A future utility district may be advisable to manage water, sewer, and effluent within the Peckham Road Area at such time the cities of Wilder and Greenleaf have interconnected their water and sewer systems. This utility district could monitor utility contributions and reimbursement to each City and ensure homogeneous utility extension within the corridor.

Additionally, this utility district could be utilized to ensure both cities have similar costs and development requirements for future businesses. The district can be used to avoid differing utility development requirements from the cities and/or county; thereby, preventing an environment where future developers can “shop” for the least restrictive development standards between Greenleaf, Wilder and Canyon County.

In order to provide the cities adequate control of their facilities, the Utility District Board should be comprised mainly of representatives of the City of Wilder and City of Greenleaf. Canyon County may also be represented on the Utility District Board since the County is a land use administrator within the Peckham corridor.

The Utility District's coordination with Golden Gate Highway District and Wilder Irrigation is imperative due to their overlapping jurisdictions. However, membership on the board is not necessary to accomplish this.

At which time the cities of Wilder and Greenleaf have annexed the majority of the Peckham Road Area, and the area's utilities can sufficiently support itself, dissolution of the Utility District may be considered. If both cities are nearly self-reliant or have shared-use agreements, it may simplify future expansion to dissolve the Utility District. A provision for the dissolution of this utility district should be clearly determined within the Articles of Incorporation, and should undoubtedly be completely in the cities' control, since they are ultimately providing the utility services.

DRY UTILITIES

14. Power

Electrical Power is provided to the Enterprise Zone from Idaho Power. The T-O Team met with and had multiple telephone conversations with Don Walz, Project Manager, Dan Johnston, Planner, Steve Brown, Project Manager and Julie Johnston throughout the process of this study. Their contact information is located in the Appendix.

Currently the Peckham Road area is serviced in two directions; it is essentially a looped system. A single 69 kV (kilovolt) line from the Caldwell substation runs along Lower Pleasant Ridge Road out to Highway 95. At that point, the line splits. One line goes south to the Homedale substation (from where the line can also be serviced). The second line goes across SH-95 to Batt Corner Road and north to Fern Lane where it terminates. This is shown on Figure N, "Enterprise Zone Power Transmission Lines" in the Appendix.

Mr. Johnston stated that Idaho Power's facilities in the area of the Enterprise Zone are built solely to meet the power demand needs at the current time and that Idaho Power does not currently have any projects planned within the Enterprise Zone. Any significant increase in loadings in the area would require upgrades to the existing infrastructure.

Idaho Power has authored a future use plan for the Treasure Valley which includes the Enterprise Zone. This study is called the Treasure Valley Electrical Plan (TVEP) and is available at: http://www.idahopower.com/pdfs/AboutUs/RegionalElectricalPlans/tvep/TVEP_final.pdf.

In their TVEP, dated October 2006, Idaho Power is viewing the Enterprise Zone as a potentially suburban area requiring approximately 7-8 megawatts per square mile (MW/mi²). To provide adequate electrical service to the future suburban area, Idaho Power has planned for two additional substations in the Peckham Road Area. These substations are located on Lower Pleasant Ridge Road near the intersections of Van Slyke Road (called the Van Slyke substation) and Friends Road (called the Greenleaf substation).

Within the Enterprise Zone, three additional substations are currently planned:

- One directly north of Wilder on US-95 (Wilder substation)
- One on Highway 20-26 and Stafford Lane (Stafford Substation)
- One near the intersection of Howe and Texas called the Howe substation. Each of these future substations are planned to be serviced by 138 kV systems as shown in Figure 5 on page 9 of the TVEP.

Typical industrial uses can vary from 30-60 MW/mi². Commercial uses average approximately 25MW/mi². Residential and mixed-use areas require approximately 10 MW/mi². For an industrial or commercial area, as assumed within this study, Idaho Power estimates approximately 30 megawatts of electrical load per square

mile in their planning studies. After describing the industrial and agricultural-related businesses the cities of Greenleaf and Wilder would like to bring to the area, Mr. Johnston stated that 30MW/mi² would probably be a good planning tool to estimate future power needs.

Given the COMPASS maps, for the Peckham Road Area examined within this study, it appears full buildout provides approximately four square miles of industrial/commercial businesses. Using this information, we can approximate the total energy need for the Peckham Road Area will be 120 MW. 120MW would require a 138 kV line from Caldwell to Wilder to Homedale. Construction of the 138 kV line from Wilder to Homedale would also be for purposes of redundancy to ensure a reliable source of power. Mr. Johnston estimated that completing the Peckham Area as shown on the COMPASS maps would require two more substations than are currently planned by Idaho Power in their Treasure Valley Electrical Plan.

Idaho Power has not purchased any future substation areas within this area. Requiring certain areas to set aside acreage during the development process would give Idaho Power an area to build a substation when required. Approximately two acres is required for an 80-megawatt substation.

Approximate costs for improvements to Idaho Power facilities are as follows:

Rebuild (or build new) 138kV transmission line: \$250,000 – 400,000 per mile

Substations:

- \$2.5 million (will provide 40 megawatts)
- \$4.0 million (will provide 80 megawatts)

A third option also exists for substations. This is a relatively new technology, but has been utilized in other areas. The option was referred to as a “Substation in a Box” by Idaho Power employees. In short, it is an approximately 10' x 20' substation that can be ordered and delivered on a truck in approximately one year. We spoke with Mr. Thomas Callsen of Exelon Corporation who stated they could provide a completely installed 10 MW substation for approximately \$1.0 million. Another advantage to these ‘substations in a box’ is they can be moved as needed or as upgrades are completed.

Currently, as shown in Figure N, the Parma area is fed by a single 69kV line that runs within the Highway 20/26 corridor. In conversations with Idaho Power, their representatives reiterated the importance of power being fed from two separate directions. This increases power reliability in much the same way as a looped water line. Upgrades to the Parma area, as it becomes necessary, can be made through an extension of power services from Wilder. This will allow Parma to be serviced by the line along Highway 20/26 and a future line on Highway 95.

There are cost sharing and reimbursement possibilities with Idaho Power for upgrade of existing lines or new construction. These reimbursement options are based on future power requirements and are examined and negotiated on a case-by-case basis.

15. Natural Gas

Natural gas is provided to the Enterprise Zone by Intermountain Gas Company. Throughout the completion of this report, Mr. Bryce Ostler and Ms. Mishelle Singleton were contacted and consulted regarding the existing and future gas facilities in the Enterprise Zone. Their contact information is available in the appendices.

Intermountain Gas has an existing 6” steel high-pressure line running the length of Peckham Road between Greenleaf and Wilder. Intermountain Gas refers to this line as a critical gas main and it operates at a pressure of 300 psi. Smaller distribution lines also exist in the area. Each of the following streets have distribution (lower

pressure) lines – Van Slyke (4”), Tucker (2”), Friends (2”), and a 4” on Peckham that feeds the majority of the users in Wilder. Once it gets to Wilder, the 6” steel critical line turns south on US-95 toward Homedale. A 6” high-pressure line also runs north on Huff Road in Wilder. These main lines are shown on the “Enterprise Zone Natural Gas Lines” Display in Appendix Figure O.

Bryce Ostler, Engineering Technician for Intermountain Gas stated that, in general, for large volume users (businesses) near a high-pressure line, Intermountain Gas would usually forego all connection fees and installation charges. In other cases, extension costs are as follows:

- \$10 per linear foot for high-pressure steel line (installed).
- \$5 per linear foot for plastic pipe (installed) used on low-pressure (distribution) lines.
- \$3,000 for a new regulator station to convert the high-pressure line to distribution pressure for business parks, etc.

Individual businesses can also connect directly to the high-pressure line on Peckham (or other location) via use of a service tee and remote regulator, which is much cheaper than a standard regulator station.

Mr. Ostler stated that volume and pressure of natural gas for complete buildout of the Peckham Road Area, as shown on the COMPASS maps, could sufficiently be provided utilizing the existing 6” high-pressure line located within Peckham Road.

16. Communications (Cable/Fiber Optic/Phone)

Cable, Fiber Optic and Phone Utilities are provided throughout the Peckham Road corridor by Frontier Communications, Qwest, and Cable One. These utilities are displayed on the “Peckham Road Communications Map” in Appendix Figure Q.

Frontier Communication’s local office (contact: Mike Riggs) is in Homedale and their phone and fiber optic service area is currently west of Van Slyke Road. Qwest’s local office (contact Don Bottoms) is in Caldwell and they mirror Frontier’s services on the east side of Van Slyke Road. Cable One (contact: Ramiro Espinoza) stated that they provide high speed internet and cable services throughout the Peckham Road corridor.

Each of the companies stated that extending the services to new locations was relatively cheap and easy to accomplish, but would be driven by development. Qwest and Cable One stated that any extensions would need to be paid for by the developers. Frontier stated that developers paid for any residential extensions of their services, but Frontier paid for the expansion of their services to any commercial sites.

We also spoke with Ken Gibbs of Oregon-Idaho Utilities (Nampa office). Mr. Gibbs stated that Oregon-Idaho Utilities has a buried fiber optic cable on Red Top Road, but refused to provide any maps citing national security concerns.

ATTRACTING BUSINESS

17. Business Owner Synopsis

A number of businesses were contacted throughout the process of this infrastructure study to assess what improvements would aid their businesses, what they considered detriments and to attempt to ascertain what made their businesses succeed. The companies represented in our interviews were either within the Peckham Road Area or businesses that fit the industrial/agricultural pattern that the cities of Wilder and Greenleaf expressed interest in developing. A synopsis of each of these interviews is contained within the Appendix (Item 19) of this report. Below are some conclusions and generalizations that were gleaned from these business owners regarding how the Peckham corridor can be made more attractive to agricultural and industrial businesses.

In each of our conversations with business owners, we asked why the owner believed they had been successful in their industry and at their location. Given the range of business that we interviewed, there were quite a few different answers, but there were a few that nearly each of the businessmen stated:

- 1) Good employees
- 2) Good product
- 3) Good service
- 4) Low overhead

The more we talked to businesses, the more we heard about their concern for low overhead, especially from the agricultural related businesses. Businesses that supply commodities (such as steel, onions, beans, etc.) compete largely on price. To compete with other businesses that supply commodities, the amount of overhead, and specifically unreturned costs, must be minimized. Otherwise, the business will fail, or the business will seek location where unreturned costs are minimized. Many of these businesses require relatively minor improvements to the land – an asphalt parking lot, perhaps a loading dock and a metal pre-fabricated building. The businessmen we talked to spoke of their low overhead costs and low maintenance operations as a key to success.

18. Development Requirements

With the owner's repeated emphasis on low overhead costs, we began to examine the City of Wilder and City of Greenleaf Comprehensive Plans and Development Ordinances. As currently written, there are some development requirements in the Wilder and Greenleaf ordinances that may prohibit or stunt industrial and agricultural growth within these cities: requirements for curb, gutter, and sidewalk along with landscaping are overhead costs that cannot be recouped by business owners. And while the curb, gutter, sidewalk and asphalt is a one-time cost, the maintenance of landscaping is a perpetual cost. Landscaping and the associated maintenance was cited by multiple business owners as a potential "deal-breaker", especially for those who only occupy their site for only a portion of the year.

Both the cities of Wilder and Greenleaf state in their comprehensive plans they prefer residential developments that are well kept, landscaped and pedestrian-friendly. The ordinances of these two cities reflect this. However, if the cities of Wilder and Greenleaf are attempting to make the Enterprise Zone as enticing as possible to industrial and agricultural related business, some of these requirements will need to be relaxed for industrial and agricultural businesses. This can be done on a case-by-case basis, via an 'overlay zone', or through an ordinance change.

Both cities and Canyon County should have similar requirements for businesses and similar ordinances, within this area, to create uniformity within the Peckham Road Area and in order to present homogenous options to businesses and developers looking to grow or relocate within this area. Substantial differences in the ordinances and/or requirements of the two cities could create uneven development throughout the area. Both cities should also be active in responding to land use applications presented to the County within their respective Impact Zones, and especially in the Peckham Road area, to ensure compatible use, zoning and development requirements.

19. Non-Compatible Uses

Given the data provided by COMPASS, if the cities of Wilder and Greenleaf, as well as Canyon County wish to create a commercial/industrial/agricultural area in the Peckham Road Area with minimal non-compatible uses, zoning of this area and approval of uses in this area will be important. With residential numbers outpacing job growth, it may be reasonable to narrow the width of the commercial-industrial area to allow for more residential area, but interspersing the residential with the commercial-industrial uses will likely cause long-term conflicts. It may also cause a significant amount of area to be “wasted” in buffering between non-compatible uses.

Disseminating the information that the City of Wilder and City of Greenleaf are striving to protect this area for industrial and commercial growth, while emphasizing the necessity of separation of industrial and residential growth, will be vital to maximizing the utilization and efficiency of the desired industrial zone.

20. Conclusions & Recommendations

This report outlines a number of directions the City of Wilder and City of Greenleaf can proceed within the Peckham Road Area. The majority of these options are probably not economically feasible to implement at the current time. Neither of the cities, nor the county, currently have an abundance of funds to dedicate to this area. Likewise, the development community has become much more conservative with the economic downturn.

However, this should not prevent the two cities from continuing to plan and prepare for the eventual growth and annexation of this area. Agricultural products, the main industry of the Peckham Road Area, have been very stable even during this tumultuous time. The City of Greenleaf is currently in the process of engineering the wastewater treatment plant that will be used to service this area. Once completed, this will open up development options; residential, commercial and industrial, that have never existed before. With this in mind, we suggest that the cities and Canyon County complete what is possible now; preparing for development, revising any necessary codes or policies, making initial business contacts. This way, when the economic times do change, they are prepared to proceed quickly.